ICP05
Printing and Graphic Arts Training Package

Multimedia and Printing Units of Competency

This document contains part of the endorsed components of the Training Package. It should not be used in isolation but must be used in the context of the whole endorsed Training Package.

Volume 3 of 6
Printing and Graphic Arts Training Package (Volume 3 - Multimedia and Printing Units of Competency)

1 of 6 Introduction, Assessment Guidelines and Qualifications
2 of 6 Support and Pre-press Units of Competency
4 of 6 Converting, Binding and Finishing Units of Competency
5 of 6 Screen Printing, Ink Manufacture and Holistic Knowledge Units of Competency
Vol 6 of 6 Imported Units of Competency

To be reviewed by 31 August 2008

Endorsed 22 July 2005
ICP05 - Printing and Graphic Arts Training Package

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Building B, Level 2 192 Burwood Road
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## Version Modification History

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<td></td>
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<td>• Unit reformatted into latest template requirements; Skills and Knowledge improved.</td>
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Qualifications Framework

The Australian Qualifications Framework

What is the Australian Qualifications Framework?

A brief overview of the Australian Qualifications Framework (AQF) follows. For a full explanation of the AQF, see the AQF Implementation Handbook. The 2007 version of the AQF Implementation Handbook is expected to be available on the Australian Qualifications Framework Advisory Board (AQFAB) website www.aqf.edu.au during September 2007, and in print in October 2007 (obtain the hard copy by contacting AQFAB on phone 03 9639 1606 or email at aqfab@curriculum.edu.au).

The AQF provides a comprehensive, nationally consistent framework for all qualifications in post-compulsory education and training in Australia. In the vocational education and training (VET) sector it assists national consistency for all trainees, learners, employers and providers by enabling national recognition of qualifications and Statements of Attainment.

Training Package qualifications in the VET sector must comply with the titles and guidelines of the AQF. Endorsed Training Packages provide a unique title for each AQF qualification which must always be reproduced accurately.

Qualifications

Training Packages can incorporate the following eight AQF qualifications.

- Certificate I in ...
- Certificate II in ...
- Certificate III in ...
- Certificate IV in ...
- Diploma of ...
- Advanced Diploma of ...
- Vocational Graduate Certificate of ...
- Vocational Graduate Diploma of ...

On completion of the requirements defined in the Training Package, a Registered Training Organisation (RTO) may issue a nationally recognised AQF qualification. Issuance of AQF qualifications must comply with the advice provided in the AQF Implementation Handbook and the AQTF 2007 Essential Standards for Registration.

Statement of Attainment

A Statement of Attainment is issued by a Registered Training Organisation when an individual has completed one or more units of competency from nationally recognised qualification(s)/course(s). Issuance of Statements of Attainment must comply with the advice provided in the current AQF Implementation Handbook and the AQTF 2007 Essential Standards for Registration.

Under the AQTF 2007, RTOs must recognise the achievement of competencies as recorded on a qualification or Statement of Attainment issued by other RTOs. Given this, recognised competencies can progressively build towards a full AQF qualification.

AQF Guidelines and Learning Outcomes

The AQF Implementation Handbook provides a comprehensive guideline for each AQF qualification. A summary of the learning outcome characteristics and their distinguishing features for each VET related AQF qualification is provided below.

Certificate I
### Certificate II

**Characteristics of Learning Outcomes**

Breadth, depth and complexity of knowledge and skills would prepare a person to perform in a range of varied activities or knowledge application where there is a clearly defined range of contexts in which the choice of actions required is usually clear and there is limited complexity in the range of operations to be applied.

Performance of a prescribed range of functions involving known routines and procedures and some accountability for the quality of outcomes.

Applications may include some complex or non-routine activities involving individual responsibility or autonomy and/or collaboration with others as part of a group or team.

**Distinguishing Features of Learning Outcomes**

Do the competencies enable an individual with this qualification to:

- demonstrate basic operational knowledge in a moderate range of areas;
- apply a defined range of skills;
- apply known solutions to a limited range of predictable problems;
- perform a range of tasks where choice between a limited range of options is required;
- assess and record information from varied sources;
- take limited responsibility for own outputs in work and learning.

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### Certificate III

**Characteristics of Learning Outcomes**

Breadth, depth and complexity of knowledge and competencies would cover selecting, adapting and transferring skills and knowledge to new environments and providing technical advice and some leadership in resolution of specified problems. This would be applied across a range of roles in a variety of contexts with some complexity in the extent and choice of options available.

Performance of a defined range of skilled operations, usually within a range of broader related activities involving known routines, methods and procedures, where some discretion and judgement is required in the section of equipment, services or contingency measures and within known time constraints.

Applications may involve some responsibility for others. Participation in teams including
group or team co-ordination may be involved.

**Distinguishing Features of Learning Outcomes**

Do the competencies enable an individual with this qualification to:

- demonstrate some relevant theoretical knowledge
- apply a range of well-developed skills
- apply known solutions to a variety of predictable problems
- perform processes that require a range of well-developed skills where some discretion and judgement is required
- interpret available information, using discretion and judgement
- take responsibility for own outputs in work and learning
- take limited responsibility for the output of others.

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**Certificate IV**

**Characteristics of Learning Outcomes**

Breadth, depth and complexity of knowledge and competencies would cover a broad range of varied activities or application in a wider variety of contexts most of which are complex and non-routine. Leadership and guidance are involved when organising activities of self and others as well as contributing to technical solutions of a non-routine or contingency nature.

Performance of a broad range of skilled applications including the requirement to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills. Applications involve responsibility for, and limited organisation of, others.

**Distinguishing Features of Learning Outcomes**

Do the competencies enable an individual with this qualification to:

- demonstrate understanding of a broad knowledge base incorporating some theoretical concepts
- apply solutions to a defined range of unpredictable problems
- identify and apply skill and knowledge areas to a wide variety of contexts, with depth in some areas
- identify, analyse and evaluate information from a variety of sources
- take responsibility for own outputs in relation to specified quality standards
- take limited responsibility for the quantity and quality of the output of others.

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**Diploma**

**Characteristics of Learning Outcomes**

Breadth, depth and complexity covering planning and initiation of alternative approaches to skills or knowledge applications across a broad range of technical and/or management requirements, evaluation and co-ordination.

The self directed application of knowledge and skills, with substantial depth in some areas where judgment is required in planning and selecting appropriate equipment, services and techniques for self and others.

Applications involve participation in development of strategic initiatives as well as personal responsibility and autonomy in performing complex technical operations or organising others. It may include participation in teams including teams concerned with planning and evaluation.
functions. Group or team co-ordination may be involved.

The degree of emphasis on breadth as against depth of knowledge and skills may vary between qualifications granted at this level.

**Distinguishing Features of Learning Outcomes**

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate understanding of a broad knowledge base incorporating theoretical concepts, with substantial depth in some areas
- analyse and plan approaches to technical problems or management requirements
- transfer and apply theoretical concepts and/or technical or creative skills to a range of situations
- evaluate information, using it to forecast for planning or research purposes
- take responsibility for own outputs in relation to broad quantity and quality parameters
- take some responsibility for the achievement of group outcomes.

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**Advanced Diploma**

**Characteristics of Learning Outcomes**

Breadth, depth and complexity involving analysis, design, planning, execution and evaluation across a range of technical and/or management functions including development of new criteria or applications or knowledge or procedures.

The application of a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts in relation to either varied or highly specific functions. Contribution to the development of a broad plan, budget or strategy is involved and accountability and responsibility for self and others in achieving the outcomes is involved.

Applications involve significant judgement in planning, design, technical or leadership/guidance functions related to products, services, operations or procedures.

The degree of emphasis on breadth as against depth of knowledge and skills may vary between qualifications granted at this level.

**Distinguishing Features of Learning Outcomes**

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate understanding of specialised knowledge with depth in some areas
- analyse, diagnose, design and execute judgements across a broad range of technical or management functions
- generate ideas through the analysis of information and concepts at an abstract level
- demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills
- demonstrate accountability for personal outputs within broad parameters
- demonstrate accountability for personal and group outcomes within broad parameters.

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**Vocational Graduate Certificate**

**Characteristics of competencies or learning outcomes**

- The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Substantial breadth and complexity involving the initiation, analysis, design, planning, execution and evaluation of technical and management functions in highly varied and
highly specialised contexts.

• Applications involve making significant, high-level, independent judgements in major broad or planning, design, operational, technical and management functions in highly varied and specialised contexts. They may include responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.

• The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

• Demonstrate the self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.

• Initiate, analyse, design, plan, execute and evaluate major broad or technical and management functions in highly varied and highly specialised contexts.

• Generate and evaluate ideas through the analysis of information and concepts at an abstract level.

• Demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills in complex contexts.

• Demonstrate responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.

Vocational Graduate Diploma

Characteristics of competencies or learning outcomes

• The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.

• Substantial breadth, depth and complexity involving the initiation, analysis, design, planning, execution and evaluation of major functions, both broad and highly specialised, in highly varied and highly specialised contexts.

• Further specialisation within a systematic and coherent body of knowledge.

• Applications involve making high-level, fully independent, complex judgements in broad planning, design, operational, technical and management functions in highly varied and highly specialised contexts. They may include full responsibility and accountability for all aspects of work and functions of others, including planning, budgeting and strategy development.

• The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

• Demonstrate the self-directed development and achievement of broad and highly specialised areas of knowledge and skills, building on prior knowledge and skills.

• Initiate, analyse, design, plan, execute and evaluate major functions, both broad and within highly varied and highly specialised contexts.

• Generate and evaluate complex ideas through the analysis of information and concepts at an abstract level.

• Demonstrate an expert command of wide-ranging, highly specialised, technical, creative or conceptual skills in complex and highly specialised or varied contexts.

• Demonstrate full responsibility and accountability for personal outputs.

• Demonstrate full responsibility and accountability for all aspects of the work or functions of others, including planning, budgeting and strategy.

Qualification Pathways
The following pathways charts are provided to show the types of pathways into and from qualifications that are possible with this Training Package. For more information about qualifications and pathways contact Innovation and Business Industry Skills Council (http://www.ibsa.org.au).

Skill Sets

Definition

Skill sets are defined as single units of competency, or combinations of units of competency from an endorsed Training Package, which link to a licence or regulatory requirement, or defined industry need.

Wording on Statements of Attainment

Skill sets are a way of publicly identifying logical groupings of units of competency which meet an identified need or industry outcome. Skill sets are not qualifications.

Where skill sets are identified in a Training Package, the Statement of Attainment can set out the competencies a person has achieved in a way that is consistent and clear for employers and others. This is done by including the wording "these competencies meet [insert skill set title or identified industry area] need" on the Statement of Attainment. This wording applies only to skill sets that are formally identified as such in the endorsed Training Package. See the 2007 edition of the AQF Implementation Handbook for advice on wording on Statements of Attainment the updated version is expected to be available on the AQFAB website www.aqf.edu.au during September 2007 and in print in October 2007.

Skill Sets in this Training Package

Where this section is blank, nationally recognised skill sets have yet to be identified in this industry.
Assessment Guidelines

Introduction

These Assessment Guidelines provide the endorsed framework for assessment of units of competency in this Training Package. They are designed to ensure that assessment is consistent with the AQTF 2007. Assessments against the units of competency in this Training Package must be carried out in accordance with these Assessment Guidelines.

Assessment System Overview

This section provides an overview of the requirements for assessment when using this Training Package, including a summary of the AQTF 2007 requirements; licensing/registration requirements; and assessment pathways.

Benchmarks for Assessment

Assessment within the National Skills Framework is the process of collecting evidence and making judgments about whether competency has been achieved to confirm whether an individual can perform to the standards expected in the workplace, as expressed in the relevant endorsed unit of competency.

In the areas of work covered by this Training Package, the endorsed units of competency are the benchmarks for assessment. As such, they provide the basis for nationally recognised Australian Qualifications Framework (AQF) qualifications and Statements of Attainment issued by Registered Training Organisations (RTOs).

Australian Quality Training Framework Assessment Requirements

Assessment leading to nationally recognised AQF qualifications and Statements of Attainment in the vocational education and training sector must meet the requirements of the AQTF as expressed in the AQTF 2007 Essential Standards for Registration.


Registration of Training Organisations

Assessment must be conducted by, or on behalf of, an RTO formally registered by a State or Territory Registering/Course Accrediting Body in accordance with the AQTF 2007 Essential Standards for Registration. The RTO must have the specific units of competency and/or AQF qualifications on its scope of registration.

Quality Training and Assessment

Each RTO must provide quality training and assessment across all its operations. See the AQTF 2007 Essential Standards for Registration, Standard 1.

Assessor Competency Requirements

Each person involved in training, assessment or client service must be competent for the functions they perform. See the AQTF 2007 Essential Standards for Registration, Standard 1, for assessor (and trainer) competency requirements.

Assessment Requirements

The RTOs assessments, including RPL, must meet the requirements of the relevant endorsed Training Package. See the AQTF 2007 Essential Standards for Registration, Standard 1.

Assessment Strategies
Each RTO must have strategies for training and assessment that meet the requirements of the relevant Training Package or accredited course and are developed in consultation with industry stakeholders. See the AQTF 2007 *Essential Standards for Registration*, Standard 1.

**National Recognition**

Each RTO must recognise the AQF qualifications and Statements of Attainment issued by any other RTO. See the AQTF 2007 *Essential Standards for Registration*, Condition of Registration 7: Recognition of qualifications issued by other RTOs.

**Access and Equity and Client Outcomes**

Each RTO must adhere to the principles of access and equity and maximise outcomes for its clients. See the AQTF 2007 *Essential Standards for Registration*, Standard 2.

**Monitoring Assessments**

Training and/or assessment provided on behalf of the RTO must be monitored to ensure that it is in accordance with all aspects of the Essential Standards for Registration. See the AQTF 2007 *Essential Standards for Registration*, Standard 3.

**Recording Assessment Outcomes**

Each RTO must manage records to ensure their accuracy and integrity. See the AQTF 2007 *Essential Standards for Registration*, Standard 3.

**Issuing AQF Qualifications and Statements of Attainment**

Each RTO must issue AQF qualifications and Statements of Attainment that meet the requirements of the current AQF Implementation Handbook and the endorsed Training Packages within the scope of its registration. An AQF qualification is issued once the full requirements for a qualification, as specified in the nationally endorsed Training Package are met. A Statement of Attainment is issued when an individual has completed one or more units of competency from nationally recognised qualification(s)/course(s). See the AQTF 2007 and the 2007 edition of the AQF Implementation Handbook-available on the AQFAB website <www.aqf.edu.au>.

**Licensing/Registration Requirements**

The developers of this Training Package, and DEST, consider that no licensing or registration requirements apply to RTOs, assessors or candidates with respect to this Training Package. Contact the relevant State or Territory Department(s) to check if there are any licensing or registration requirements with which you must comply. For further information on this topic contact:

Innovation and Business Skills Australia

Level 2, Building B, 192 Burwood Road

Hawthorn Victoria 3122

Telephone: (03) 9815 7000

Facsimile: (03) 9815 7001

Web: http://www.ibsa.org.au

Email: virtual@ibsa.org.au

**Pathways**

The competencies in this Training Package may be attained in a number of ways including through:
• formal or informal education and training
• experiences in the workplace
• general life experience, and/or
• any combination of the above.

Assessment under this Training Package leading to an AQF qualification or Statement of Attainment may follow a learning and assessment pathway, an assessment-only or recognition pathway, or a combination of the two as illustrated in the following diagram.

Learning and Assessment Pathways
- Learning and Assessment Pathways
- and/or
- Assessment Only or Recognition of Prior Learning Pathways
- Statement of Attainment and/or qualification under the Australian Qualifications Framework

Each of these assessment pathways leads to full recognition of competencies held - the critical issue is that the candidate is competent, not how the competency was acquired.

Assessment, by any pathway, must comply with the assessment requirements set out in the Assessment Guidelines of the Training Package and the AQTF 2007.

**Learning and Assessment Pathways**

Usually, learning and assessment are integrated, with assessment evidence being collected and feedback provided to the candidate at anytime throughout the learning and assessment process.

Learning and assessment pathways may include structured programs in a variety of contexts using a range of strategies to meet different learner needs. Structured learning and assessment programs could be: group-based, work-based, project-based, self-paced, action learning-based; conducted by distance or e-learning; and/or involve practice and experience in the workplace.

Learning and assessment pathways to suit Australian Apprenticeships have a mix of formal structured training and structured workplace experience with formative assessment activities through which candidates can acquire and demonstrate skills and knowledge from the relevant units of competency.

**Assessment-Only or Recognition of Prior Learning Pathway**

Competencies already held by individuals can be formally assessed against the units of competency in this Training Package, and should be recognised regardless of how, when or where they were achieved.

In an assessment-only or Recognition of Prior Learning (RPL) pathway, the candidate provides current, quality evidence of their competency against the relevant unit of competency. This process may be directed by the candidate and verified by the assessor, such as in the compilation of portfolios; or directed by the assessor, such as through observation of workplace performance and skills application, and oral and/or written assessment. Where the outcomes of this process indicate that the candidate is competent,
structured training is not required. The RPL requirements of the AQTF 2007 must be met (Standard 1).

As with all assessment, the assessor must be confident that the evidence indicates that the candidate is currently competent against the endorsed unit of competency. This evidence may take a variety of forms and might include certification, references from past employers, testimonials from clients, and work samples. The onus is on candidates to provide sufficient evidence to satisfy assessors that they currently hold the relevant competencies. In judging evidence, the assessor must ensure that the evidence of prior learning is:

- authentic (the candidate’s own work)
- valid (directly related to the current version of the relevant endorsed unit of competency)
- reliable (shows that the candidate consistently meets the endorsed unit of competency)
- current (reflects the candidate’s current capacity to perform the aspect of the work covered by the endorsed unit of competency), and
- sufficient (covers the full range of elements in the relevant unit of competency and addresses the four dimensions of competency, namely task skills, task management skills, contingency management skills, and job/role environment skills).

The assessment only or recognition of prior learning pathway is likely to be most appropriate in the following scenarios:

- candidates enrolling in qualifications who want recognition for prior learning or current competencies
- existing workers
- individuals with overseas qualifications
- recent migrants with established work histories
- people returning to the workplace, and
- people with disabilities or injuries requiring a change in career.

Combination of Pathways

Where candidates for assessment have gained competencies through work and life experience and gaps in their competence are identified, or where they require training in new areas, a combination of pathways may be appropriate.

In such situations, the candidate may undertake an initial assessment to determine their current competency. Once current competency is identified, a structured learning and assessment program ensures that the candidate acquires the required additional competencies identified as gaps.

Assessor Requirements

This section identifies the mandatory competencies for assessors, and clarifies how others may contribute to the assessment process where one person alone does not hold all the required competencies.

Assessor Competencies

The AQTF 2007 specifies mandatory competency requirements for assessors. For information, Standard 1, Element 1.4 from the AQTF 2007 Essential Standards for Registration follows:

<table>
<thead>
<tr>
<th>1.4</th>
<th>Training and assessment is delivered by trainers and assessors who:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>have the necessary training and assessment competencies as determined by the National Quality Council or its successors</td>
</tr>
<tr>
<td>b)</td>
<td>have the relevant vocational competencies at least to the level being delivered or</td>
</tr>
</tbody>
</table>
assessed

c) continue developing their vocational and training and assessment competencies to support continuous improvements in the delivery of the RTO’s services.

Designing Assessment Tools

This section provides an overview on the use and development of assessment tools.

Use of Assessment Tools

Assessment tools provide a means of collecting the evidence that assessors use in making judgments about whether candidates have achieved competency.

There is no set format or process for the design, production or development of assessment tools. Assessors may use prepared assessment tools, such as those specifically developed to support this Training Package, or they may develop their own.

Using Prepared Assessment Tools

If using prepared assessment tools, assessors should ensure these are benchmarked, or mapped, against the current version of the relevant unit of competency. This can be done by checking that the materials are listed on the National Training Information Service <www.ntis.gov.au>. Materials on the list have been noted by the National Quality Council as meeting their quality criteria for Training Package support materials.

Developing Assessment Tools

When developing assessment tools, assessors must ensure that they:

- are benchmarked against the relevant unit or units of competency
- are reviewed as part of the continuous improvement of assessment strategies as required under Standard 1 of the AQTF 2007
- meet the assessment requirements expressed in Standard 1 of the AQTF 2007.

A key reference for assessors developing assessment tools is TAA04 Training and Assessment Training Package and the unit of competency TAAASS403A Develop assessment tools. There is no set format or process for the design, production or development of assessment materials.

Conducting Assessment

This section details the mandatory assessment requirements and provides information on equity in assessment including reasonable adjustment.

Assessment Requirements

Assessments must meet the criteria set out in the AQTF 2007 Essential Standards for Registration.

For information, the mandatory assessment requirements from Standard 1 from the AQTF 2007 Essential Standards for Registration are as follows:

1.5 Assessment, including Recognition of Prior Learning:

a) meets the requirements of the relevant Training Package or accredited course,
Assessment of Employability Skills

Employability Skills are integral to workplace competency. As such they must be considered in the design, customisation, delivery and assessment of vocational education and training programs in an integrated and holistic way, as represented diagrammatically below.

Employability Skills are embedded and explicit within each unit of competency. Training providers must use Employability Skills information in order to design valid and reliable training and assessment strategies. This analysis could include:

- reviewing units of competency to locate relevant Employability Skills and determine how they are applied within the unit
- analysing the Employability Skills Summary for the qualification in which the unit or units are packaged to help clarify relevant industry and workplace contexts and the application of Employability Skills at that qualification outcome
- designing training and assessment to address Employability Skills requirements.


Access and Equity

An individual"s access to the assessment process should not be adversely affected by restrictions placed on the location or context of assessment beyond the requirements.
specified in this Training Package: training and assessment must be bias-free.

Under the rules for their development, Training Packages must reflect and cater for the increasing diversity of Australia’s VET clients and Australia’s current and future workforce. The flexibilities offered by Training Packages should enhance opportunities and potential outcomes for all people so that we can all benefit from a wider national skills base and a shared contribution to Australia’s economic development and social and cultural life.

**Reasonable adjustments**

It is important that education providers take meaningful, transparent and reasonable steps to consult, consider and implement reasonable adjustments for students with disability.

Under the *Disability Standards for Education 2005*, education providers must make reasonable adjustments for people with disability to the maximum extent that those adjustments do not cause that provider unjustifiable hardship. While "reasonable adjustment" and "unjustifiable hardship" are different concepts and involve different considerations, they both seek to strike a balance between the interests of education providers and the interests of students with and without disability.

An adjustment is any measure or action that a student requires because of their disability, and which has the effect of assisting the student to access and participate in education and training on the same basis as students without a disability. An adjustment is reasonable if it achieves this purpose while taking into account factors such as the nature of the student's disability, the views of the student, the potential effect of the adjustment on the student and others who might be affected, and the costs and benefits of making the adjustment.

An education provider is also entitled to maintain the academic integrity of a course or program and to consider the requirements or components that are inherent or essential to its nature when assessing whether an adjustment is reasonable. There may be more than one adjustment that is reasonable in a given set of circumstances; education providers are required to make adjustments that are reasonable and that do not cause them unjustifiable hardship.

See Part 4, Chapter 2 of the *Training Package Development Handbook* (DEST, September 2007) for more information on reasonable adjustment, including examples of adjustments.

**Further Sources of Information**

The section provides a listing of useful contacts and resources to assist assessors in planning, designing, conducting and reviewing of assessments against this Training Package.

**Contacts**

Technical and Vocational Education and Training (TVET) Australia Limited
Level 21, 390 St Kilda Road, Melbourne VIC 3150
PO Box 12211, A"Beckett Street Post Office
MELBOURNE VICTORIA 8006
Ph: +61 3 9832 8100
Fax: +61 3 9832 8198
Email: sales@tvetaustralia.com.au
Web: www.tvetaustralia.com.au

For information on the TAA04 Training and Assessment Training Package contact:
General Resources

Refer to http://antapubs.dest.gov.au/publications/search.asp to locate the following ANTA publications.


AQTF 2007 Essential Standards for Registration. Training organisations must meet these standards in order to deliver and assess nationally recognised training and issue nationally recognised qualifications. They include three standards, a requirement for registered training organisations to gather information on their performance against three quality indicators, and nine conditions of registration

AQTF 2007 User’s Guide to the Essential Standards for Registration. A Users" Guide for training organisations who must meet these standards in order to deliver and assess nationally recognised training and issue nationally recognised qualifications.

AQTF 2007 Standards for Accredited Courses. State and Territory accrediting bodies are responsible for accrediting courses. This standard provides a national operating framework and template for the accreditation of courses.

TAA04 Training and Assessment Training Package. This is available from the Innovation and Innovation & Business Skills Australia (IBSA) Industry Skills Council and can be viewed, and components downloaded, from the National Training Information Service (NTIS).

National Training Information Service, an electronic database providing comprehensive information about RTOs, Training Packages and accredited courses - www.ntis.gov.au


Assessment Resources

Training Package Assessment Guides - a range of resources to assist RTOs in developing Training Package assessment materials (originally developed by ANTA with funding from the Department of Education, Training and Youth Affairs) and made up of 10 separate titles, as described at the publications page of www.dest.gov.au. Go to www.resourcegenerator.gov.au/loadpage.asp?TPAG.htm

Printed and/or CD ROM versions of the Guides can be purchased from Technical and Vocational Education and Training (TVET) Australia Limited. The resource includes the following guides:

- Training Package Assessment Materials Kit
• Assessing Competencies in Higher Qualifications
• Recognition Resource
• Kit to Support Assessor Training
• Candidates Kit: Guide to Assessment in New Apprenticeships
• Assessment Approaches for Small Workplaces
• Assessment Using Partnership Arrangements
• Strategies for ensuring Consistency in Assessment
• Networking for Assessors
• Quality Assurance Guide for Assessment

An additional guide "Delivery and Assessment Strategies" has been developed to complement these resources.

**Assessment Tool Design and Conducting Assessment**

VETASSESS & Western Australian Department of Training and Employment 2000, *Designing Tests - Guidelines for designing knowledge based tests for Training Packages*.

Vocational Education and Assessment Centre 1997, *Designing Workplace Assessment Tools, A self-directed learning program*, NSW TAFE.


**Assessor Training**


**Assessment System Design and Management**


### ICPMM263B Access and use the Internet

#### Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to access and use the Internet within the printing and graphic arts industries.

#### Employability Skills
This unit contains employability skills.

#### Application of the Unit
This unit describes the skills needed to access and use the Internet within the printing and graphic arts industry.

#### Unit Sector
Multimedia

#### ELEMENT

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Identify and use local resources</strong></td>
</tr>
<tr>
<td>1.1 Installed Internet software applications and their purposes are identified</td>
</tr>
<tr>
<td>1.2 Internet software applications are used online and offline</td>
</tr>
<tr>
<td>1.3 Extracting (decompressing) software and virus scanners are used on downloaded files</td>
</tr>
<tr>
<td>1.4 Identify Internet connection and protocols</td>
</tr>
<tr>
<td>1.5 Applications and files are downloaded and installed correctly</td>
</tr>
<tr>
<td>1.6 Potential security risks are identified and avoided</td>
</tr>
</tbody>
</table>

| **2. Identify and use remote resources** |
| 2.1 Websites are navigated to locate required information |
| 2.2 Files and documents are accessed using the Internet (world wide web) search engines |
| 2.3 The Internet is browsed to find related sites via links |
| 2.4 Files are retrieved from an FTP repository |
| 2.5 Emails are sent, downloaded, read, responded and saved to |
| 2.6 Files attached to incoming email are retrieved and attached files are sent |
| 2.7 Newsgroups relevant to the industry are accessed |
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Collecting, analysing and organising information by navigating websites to locate required information
- Planning and organising activities by navigating websites to locate required information
- Problem-solving skills by extracting files and virus scanning
- Use of technology by accessing and using the Internet

Required knowledge:
The following knowledge must be assessed as part of this unit:

How to initiate and conclude an Internet connection
- If a connection attempt fails, what could be the cause and what do you do?
- How do you know if you are still online, and how do you log off?

Appropriate uses of different Internet protocols and data types (WWW, email, etc)
- Name TWO WWW search engines.
- What is a URL?
- Why might you sometimes use email to respond to a newsgroup post?
- What is shareware?
- In which of these is maintaining (upper / lower) case important: URLs, file names, passwords?
- What are "zip" files and why are they used?
- What is the difference between Java and JavaScript?
- In what ways can you use the Internet to obtain product information and technical support?
- Approximately how long would it take to download one megabyte of data using a fast modem?

Privacy and security measures related to on line tasks
- What information would you refuse to provide when filling out a form on a web page?
- What are cookies?
- Why should you not leave the terminal unattended while online?
- Which types of files can carry viruses?
- Why must you scan for viruses before and after extracting the files from a compressed archive?
- Who owns the copyright on the types of data you retrieve?

Information sources
- What manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Software applications

- May include a wide range of programs, some current examples of which may be Eudora, Netscape. Note: these programs are constantly being upgraded and replaced and appropriate up-to-date programs should be selected

Relevant terminology used

- May include but not be limited to ISDN, PPP, TCP / IP, URL, Java, JavaScript, HTML, Download, WWW, cookies, zip files and others

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Access the Internet and retrieve data using WWW and email and newsgroups
- Send emails or newsgroup posting with correctly formatted attachments
- Perform a search and save the text of a web page to disk
- Extract and virus-scan downloaded files
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- CUFMEM12A Update web pages
ICPMM296B Create and test a CD-ROM / DVD

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to create an interactive CD-ROM / DVD which starts automatically and has no errors in any of the interactive functions.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires a person to create and test a CD-ROM / DVD with a prescribed range of functions involving known routines and procedures with some accountability for the quality of outcomes.

Unit Sector
Multimedia

ELEMENT

PERFORMANCE CRITERIA

1. Confirm data requirements
   1.1 All details required for the job are checked and confirmed against the job specifications
   1.2 Media content is tested to ensure all interactivity performs according to job specifications
   1.3 Media is compressed correctly with images at the right resolution and any text in the correct format
   1.4 Media is compressed correctly with images at the right resolution and any text in the correct format

2. Prepare the CD-ROM / DVD structure
   2.1 Target audience is identified from job specifications and a welcome page is developed
   2.2 The welcome page identifies the navigational structure of the media
   2.3 Folders for containing the media are prepared according to interactivity requirements
   2.4 DOS-style eight-dot-three-character file names are used for all files

3. Set up auto functions
   3.1 Autorun is set up to automatically start up the CD-ROM / DVD media
   3.2 ShelExec.exe is incorporated into the autorun script to ensure default programs within the shell are started
   3.3 Autorun is linked to a reader in case the target audience do not have one pre-installed
   3.4 Where autorun is linked to Adobe Reader, JavaScript is added to the appropriate folder to launch the PDF file

4. Burn CD-ROM / DVD
   4.1 The CD-ROM / DVD layout is validated and saved correctly
   4.2 The preferred CD-ROM / DVD format is chosen for the job
   4.3 A test CD-ROM / DVD is burned to test the auto functions and confirm interactivity across different platforms
   4.4 A master disc is produced for mass duplication
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by developing a welcome page that identifies the navigational structure of the media
• Collecting, analysing and organising information by correctly compressing media at the right resolution with any text in the correct format
• Planning and organising activities by preparing the CD-ROM / DVD structure before setting up auto functions
• Teamwork when maintaining the production process in association with others
• Mathematical ideas and techniques by compressing media correctly to ensure images are at the right resolution
• Problem-solving skills by testing the auto functions to confirm interactivity across different platforms
• Use of technology by using computer hardware and software to create and test a CD-ROM / DVD

Required knowledge:
The following knowledge must be assessed as part of this unit:

• Use of compression technologies
• Media types
• Relevant multimedia software
• Relevant CD / DVD hardware for burning CDs / DVDs
• Multi media navigation
• Java script
• Different multi media file formats eg PDF, JPEG, TIF

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Job specifications

• Job sheets, batch processing orders, job specs

Interactivity

• Hyperlinks, sound, movies, animation, pop-ups
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

• Create an interactive CD-ROM / DVD that starts automatically and has no errors in any of the interactive functions
• Create TWO different interactive CD-ROMs / DVDs which start automatically, have no errors in any of the interactive functions and besides autorun they will link with a reader for computers without a reader installed
• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
• appropriate computer hardware and software

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

• direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.
**ICPMM321B Capture a digital image**

### Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to use digital camera technology for the production of colour separated images.

### Employability Skills
This unit contains employability skills.

### Application of the Unit
This unit requires the individual to use digital camera technology for the production of colour separated images.

### Unit Sector
Multimedia

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assess digital camera qualities</td>
<td>1.1 Camera software compatibility with hardware system is assessed and the appropriate software is selected for the job</td>
</tr>
<tr>
<td></td>
<td>1.2 Pixel resolution of the camera is matched to the required quality and resolution of outcome</td>
</tr>
<tr>
<td></td>
<td>1.3 The RAM capacity of the camera is checked to be appropriate to the number of images required to be captured</td>
</tr>
<tr>
<td></td>
<td>1.4 Shutter speed, focal lengths and camera feature modes (eg flash, scrollage, icon menu, close-up, wide angle and telephoto capacity) are assessed suitable for the quality and use of photographic images required</td>
</tr>
<tr>
<td></td>
<td>1.5 Lithium batteries are handled and stored according to OHS requirements</td>
</tr>
<tr>
<td>2. Set up for image capture</td>
<td>2.1 Camera is set up for image composition according to job specifications</td>
</tr>
<tr>
<td></td>
<td>2.2 Lighting is arranged according to job specifications</td>
</tr>
<tr>
<td></td>
<td>2.3 Light intensity is set for the correct exposure</td>
</tr>
<tr>
<td>3. Preview image</td>
<td>3.1 Tone curves are adjusted according to job specifications</td>
</tr>
<tr>
<td></td>
<td>3.2 The neutral balance of the image is arranged and adjusted</td>
</tr>
<tr>
<td></td>
<td>3.3 Adjustments to image composition and exposure are made</td>
</tr>
<tr>
<td>4. Photograph and upload a digital image</td>
<td>4.1 The digital camera is loaded and operated according to manufacturer's specifications appropriate to the quality of image to be photographed</td>
</tr>
<tr>
<td></td>
<td>4.2 The computer card interface / disk is uploaded onto the relevant computer and the image saved on hard disk</td>
</tr>
<tr>
<td></td>
<td>4.3 Photographic image files are created and stored on the computer according to software procedures</td>
</tr>
<tr>
<td></td>
<td>4.4 Photographic images are enhanced, cropped and altered electronically to deliver the required image</td>
</tr>
<tr>
<td></td>
<td>4.5 Photographic images are checked for fitness of purpose and conformance to the job brief</td>
</tr>
<tr>
<td></td>
<td>4.6 Photographic images are assessed fit for the relevant delivery mode (eg print, CD-ROM) and delivered appropriately</td>
</tr>
</tbody>
</table>
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by consulting with supervisors over the processing of digital images
• Collecting, analysing and organising information by assessing the suitability of shutter speed, focal lengths and camera feature modes (e.g., flash, scrollage, icon menu, close-up, wide angle and telephoto capacity) for the photographic image required
• Planning and organising activities by planning and coordinating digital image capture sessions
• Teamwork when maintaining the production process in association with others
• Mathematical ideas and techniques by choosing the correct shutter speed and focal length to capture digital images
• Problem-solving skills applied by identifying and correcting problems of image quality
• Use of technology applied by using digital camera technology

Required knowledge:
The following knowledge must be assessed as part of this unit:

Using a digital camera

• What is meant by pixel resolution and how does this affect the resolution of the image?
• Why is the RAM capacity of a digital camera relevant?
• Why are shutter speed and focal lengths important to check when capturing a digital image?
• What are the safety requirements for handling and storing lithium batteries?

Uploading and processing digital images using a computer

• How is the data uploaded to a computer from the computer card interface / disk?
• What is the process for filing and creating photographic image files on the computer?
• What is required to enhance, crop and alter photographic images electronically?
• What considerations need to be made to assess a digital photograph suitable for a newspaper, glossy brochure and CD-ROM?

Information sources

• What manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Degree of autonomy
- A digital photographic image is processed in the workplace in consultation with the supervisor to ensure that correct skills and procedures are used

Types of systems
- Digital cameras used in the pre-press sector and associated sectors with which a pre-press organisation may be required to work

Lighting
- Direct (main) fill in lighting / fill reflector

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency
Evidence of the following is essential:
- The photographed image meets the quality and look / feel requirements of the brief. The digital camera functions are used to capture the required image
- The underlying skills of capturing a digital image using a digital camera should be transferable across the associated sectors of the printing industry
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Assess the capacity of, and operate, a digital camera to upload and process THREE digital images using industry hardware and software to deliver a designated quality of image outcome
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment
Assessment must ensure:
- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- digital cameras, lighting
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.
ICPMM322B Edit a digital image

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to edit and manipulate an image captured digitally and to prepare for export to electronic image assembly.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires knowledge of digital image capture, and the integral properties and characteristics of preparation of colour separation for print and digital file handling.

Unit Sector
Multimedia

ELEMENT PERFORMANCE CRITERIA

1. Assess digital image
   1.1 Digital image is opened and resolution parameters assessed against job specifications
   1.2 Image is converted from RGB to CMYK colour space
   1.3 Image characteristics are evaluated for colour and tone requirements

2. Edit digital image
   2.1 Suitable software is engaged to enable print image profiling and / or manipulation to suit print requirement
   2.2 Image is retouched to conform to job specifications
   2.3 Local colour correction is employed to conform with job specifications
   2.4 Tone correction is undertaken to conform with job specifications
   2.5 Edited image is saved to conform with job specifications
   2.6 Image storage requirements are identified and employed
   2.7 Image is saved ready for export
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

**Required skills:**
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by communicating ideas and feedback from internal and external clients
- Collecting, analysing and organising information by collecting and discussing information between client and work team members
- Planning and organising activities by discussing and integrating digital image editing with other work team members as part of the workflow
- Teamwork when sharing knowledge and information
- Mathematical ideas and techniques by applying mathematical formula to determination of image resolution requirements
- Problem-solving skills by identifying problems in quality and workflow and determining and implementing solutions
- Use of technology by understanding technology applied in a coordinated manner

**Required knowledge:**
The following knowledge must be assessed as part of this unit:

**Performing image editing**

- In what circumstances may the image require editing or manipulation?
- Why is image profiling required when preparing for printing?
- Why is image storage capability relevant?
- Why would you select for example a JPEG or TIFF file format?
- What factors may influence the grey balance and colour in the final result?

**RANGE STATEMENT**
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

**Input**
- Digital camera device

**Edit / manipulate**
- Appropriate image edit / manipulation software

**Output**
- Digital image storage capability and appropriate image digital proofing capability

**Degree of autonomy**
- Work independently to job specification
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- The photographed image meets the quality and look / feel requirements of the brief. The digital camera functions are used to capture the required image
- The understanding of image editing should be transferable across associated sectors of the printing industry
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- appropriate image manipulation software, hardware and file storage capability

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.
ICPMM344B Manipulate and incorporate audio into multimedia presentations

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to edit, combine and incorporate audio into multimedia presentations.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit describes the competency required to edit, combine and incorporate audio into multimedia presentations.

Unit Sector
Multimedia

ELEMENT PERFORMANCE CRITERIA

1. Identify and describe formats of digital audio
   1.1 The distinguishing features and uses of analogue and digital audio are determined
   1.2 Terms describing audio characteristics (amplitude, sound waves, frequency, mono and stereo) are used correctly
   1.3 Contemporary digital audio formats and their application in achieving defined outcomes are identified
   1.4 Data rates for major digital sources and their relevance to defined outcomes are determined
   1.5 Appropriate methods for saving and producing digital audio outputs are determined for a range of sources and destinations
   1.6 Sampling techniques and sources for digital audio appropriate to defined outcomes are determined
   1.7 Uses of MIDI technology are determined

2. Use digital audio software
   2.1 Appropriate digital audio software is assessed and selected for the job
   2.2 Programs are used to edit and manipulate audio according to the job brief

3. Edit digital audio
   3.1 Single and multiple audio tracks are edited to achieve a defined outcome
   3.2 Multiple tracks of digital audio are joined according to job specifications
   3.3 Digital effects are employed to modify and integrate digital audio tracks according to job specifications
   3.4 Time encoding is applied to single and multiple edited digital audio tracks according to job specifications
   3.5 An audio track is inserted into a multimedia production sequence according to job specifications
4. Construct a digital audio track

4.1 Techniques for hooking sounds are identified
4.2 Defects on sound recordings are eliminated and / or treated
4.3 Special effects and mixing techniques are used on an audio track according to job specifications
4.4 Sequencers are used to create digital audio tracks according to job specifications
4.5 MIDI and sound cards are used to create digital audio according to job specifications
4.6 An audio track is produced using appropriate track construction software and hardware
4.7 Audio tracks are saved in the appropriate file formats
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Collecting, analysing and organising information by identifying digital audio formats
• Mathematical ideas and techniques by identifying digital audio formats
• Problem-solving skills by employing digital effects and modifying and integrating audio tracks
• Use of technology by incorporating audio into multimedia presentations

Required knowledge:
The following knowledge must be assessed as part of this unit:

The principles of analogue and digital audio

• What are the distinguishing features of analogue and digital audio?
• What is meant by amplitude, sound waves, frequency, mono and stereo?
• What are some contemporary digital audio formats?
• What data rates apply to selected digital sources?
• What is meant by sampling, sampling techniques and sources for sampling digital audio?
• What is MIDI technology?

Contemporary digital audio formats

• What are the distinguishing features of selected digital audio software?

Methods for saving and producing digital audio outputs

• What is an audio frame?
• How do you join multiple tracks of digital audio?
• What types of digital effects are used to modify and integrate digital audio tracks?
• What is the purpose of time encoding?
• What is a storybook design?

The principles of editing audio tracks

• Why are sequencers used to create digital audio tracks?
• What are the purposes of sound cards?

Information sources

• What manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Software

- May include sound editing software such as Protools and Fairlight. Note: these programs are constantly being upgraded and replaced and appropriate up-to-date programs should be selected

Equipment used

- May include digital recorders with / without timecode, analogue recording devices, multi track recorder, stereo recorder, portable mixers, microphones including lavalier or neck, shotgun and directional, special application, radio, stereo, amplifiers, microphone stands, microphone accessories, microphone windscreens, speakers, mixing console / desk, effects rack, tape machines, turntables, CD (compact disc) player, sequence sampler, computer DAT (digital audio tape), mini disc, reel to reel tape recorder, hard disc recorder, DVD (digital versatile disc), sound editing software including Protools and Fairlight, cables and connectors

Source material

- May include dialogue, additional dialogue / voice overs, FX (effects), music, atmosphere, Foley

Audio defects

- May include hissing, popping, black holes

Multimedia productions

- May include or be included in any aspects or sections of film / video production, educational product, game, promotional product, information product, training product, e-commerce and a range of others
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Incorporate audio elements into different multimedia sequences, according to job specifications and the Performance Criteria
- Incorporate audio elements into at least TWO different multimedia sequences, according to job specifications and the Performance Criteria. There should also be evidence of:
  - Ability to find and use information relevant to the task from a variety of information sources
  - Ability to use a range of software suitable for incorporating and manipulating sound
  - Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- CUFMEM12A Update web pages
ICPMM346B Incorporate video into multimedia presentations

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to edit, combine and incorporate video into multimedia presentations.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit describes the competency required to edit, combine and incorporate video into multimedia presentations.

Unit Sector
Multimedia

ELEMENT PERFORMANCE CRITERIA

1. Identify and describe formats of digital video
   1.1 The distinguishing features and uses of a range of digital video software are determined
   1.2 Current video software appropriate to a range of given outcomes is selected
   1.3 Limiting factors of computer hardware on video production for a specified job are determined
   1.4 Differences of image quality and image size required to deliver the desired outcome are determined
   1.5 Data input, processing and output relevant to video are explained
   1.6 The formats employed to create a given computer video sequence for a specified outcome are analysed

2. Design digital video
   2.1 Appropriate digital video software for the job is assessed and selected
   2.2 Digital video editing software is used to combine video assets
   2.3 Variations in video frame rates are controlled as required for the job to be undertaken
   2.4 Time stamping techniques are applied to the video frames as required for the job to be undertaken
   2.5 Digital video is saved using the appropriate file techniques

3. Edit digital video
   3.1 Single and multiple video tracks are edited to achieve a defined outcome
   3.2 Multiple tracks of digital video are joined according to job specifications
   3.3 Digital effects are employed to modify and integrate digital video tracks according to job specifications
   3.4 Time encoding is applied to single and multiple edited digital video tracks according to job specifications
   3.5 A video track is inserted into a multimedia production sequence according to job specifications

4. Present a digital video sequence
   4.1 Digital video is tested and combined with other digital imaging, sound and / or animation to create a multimedia sequence
   4.2 The multimedia sequence including video is saved and presented to the client
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Collecting, analysing and organising information by analysing formats to create a video sequence
• Planning and organising activities by determining limiting factors of computer hardware
• Mathematical ideas and techniques by determining differences of image quality and image size
• Problem-solving skills by determining limiting factors of computer hardware
• Use of technology by incorporating video into multimedia presentations

Required knowledge:
The following knowledge must be assessed as part of this unit:

Digital video formats
• What are the distinguishing features of a selected video software program?
• What are some of the limiting factors of video production on computer?
• Why are differences of image quality and image size obtained?

Contemporary video software
• What is involved in combining given video assets?
• Describe the features of and differences between TWO current video software packages.

Principles of video production
• How are variations in video frame rates controlled?
• Why are time stamping techniques applied to video frames?

The digital medium for video
• What needs to be considered when combing digital video with other digital imaging, sound and / or animation to create a multimedia sequence?

Information sources
• What manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Multimedia products or presentations
- May include educational game, promotional information, training, e-commerce and a range of others

Industry standard software
- May include a wide range of current programs examples of which are Adobe Premier, QuickTime, Media 100. Note: these programs are constantly being upgraded and replaced and appropriate up-to-date programs should be selected

Digital imaging
- May include titles / text, graphic images, 2D and 3D animation, 3D modelling, opticals, transitions such as dissolves, fade ins, fade outs, supers, subtitles, special effects

Sound
- May include sound effects, music, atmospherics, dialogue, additional dialogue, eg re-recorded and narration

Documentation
- May be computer-generated, manually written, scripts, production schedules, manufacturer’s specifications / instructions, contracts, edit decision lists (EDLs), list of sequences with relevant shot numbers, assembly order, marked-up scripts, marked-up transcripts, sound sheets including timecode log sheets for location sound recordings, wild line and sound effects log sheets

Visual effects
- May include keyers to combine, DVEs to move and distort, colour corrections to modify, texture generation to add blur, trackers to follow parts of the picture, production of titles, production of optical effects, graphic images, opticals, transitions such as dissolves, fade ins, fade outs, supers, subtitles, special effects

Video format
- May include VHS, SVHS, DVC, Umatic, SP, Beta-cam, Digital Beta-cam
Editing equipment

- May include computer hardware, non-linear digital editing and graphics software programs, monitors, keyboard and mouse, external hard drive, external disk drive, additional computer hardware, source and record machines, computer software programs, graphics computer program, digital video effects system (DVE), digital disk recorder (DDR), video transfer recorder (VTR)

Editing consumable materials

- May include computer disks, paper for hardcopy, compact discs

Memory

- May include disk, hard drive - internal, external

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Design, compile, edit and test multimedia sequences incorporating video, according to job specifications and the Performance Criteria
- Design, compile, edit and test at least TWO multimedia sequences incorporating video, according to job specifications and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- CUFMEM06A Design a multimedia product
- CUFMEM07A Apply principles of visual design and communication to the development of a multimedia product
ICPMM491B Create an extensible document

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to create a well-formed syntax error-free extensible markup language document.

Employability Skills
This unit contains employability skills.

Prerequisite Unit(s)
ICAB4135B Create a simple mark-up language document to specification

Application of the Unit
This unit requires the individual to create an extensible markup language (XML / PPML) document for content publishing that is well-formed, free of errors, meets the needs of the business and is extensible to meet future business needs. For this unit the extensible markup language document is the data-store and ICPMM492B Create an extensible style sheet transforms the XML / PPML into screen or print output.

Unit Sector
Multimedia

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Define document structure | 1.1 All details required for the job are checked and confirmed against the job specifications  
1.2 The markup language version and the character encoding used in the document or declaration statement are defined and / or inserted in the document  
1.3 An external or internal Document Type Definition (DTD) or markup language schema is chosen and correctly wrapped and referenced depending on project requirements  
1.4 The root element is correctly defined and all elements are accurately nested  
1.5 Attribute types and default values are declared, where necessary, to provide information about the data  
1.6 Occurrences of elements are stated and elements of mixed content declared |
| 2. Confirm validity | 2.1 Start and end tags are included and closed to ensure no element errors  
2.2 Namespaces are used to resolve name conflicts  
2.3 The document is well-formed, error-free and conforms to the markup language syntax rules  
2.4 The document conforms to the rules of a Document Type Definition (DTD) or the markup language schema |
| 3. Finalise and test document | 3.1 Character data (CDATA) sections are added to the document structure  
3.2 The final document is viewed with a markup language parser  
3.3 The markup language document is well-formed, free of errors and meets the needs of the business  
3.4 The document is linked to an extensible style sheet and template and tested  
3.5 The document is extensible to meet future business needs |
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information applied by detailing attribute types and default values
- Collecting, analysing and organising information by forming an error-free document that conforms to the markup language syntax rules
- Planning and organising activities by defining the document structure prior to confirming validity
- Teamwork when maintaining the production process in association with others
- Mathematical ideas and techniques by detailing attribute types and default values
- Problem-solving skills by developing a markup language document free of errors
- Use of technology by using industry software to create a markup language document

Required knowledge:
The following knowledge must be assessed as part of this unit:

SGML

- What is the Standard Generalised Markup Language and why is it important?
- How does SGML relate to XML and PPML?
- What is the difference between SGML, PPML and XML and when would you use SGML over XML?

XSL

- How do Cascading Style Sheets (CSS) and XSL differ?
- What is the intended purpose of XSL?

HTML

- When would you use an extensible markup language over HTML and why?
- In what ways could you use both with the one set of data?

Metadata

- What purposes does metadata serve within a markup language document?
- Why is PRISM important for content publishing?

PPML

- How does Personalised Print Markup Language relate to XML?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Document
- Contains elements, entity references, comments, processing instructions, marked sections and document type definition or markup language schema

Markup language
- New languages markup languages are becoming available regularly and examples include XML and PPML. This unit does not cover HTML which is covered by another unit ICAB4135B Create a simple mark-up language document to specification

PPML
- Personalised Print Markup Language

Document purpose
- Electronic publishing, e-commerce, web services, interchange of data amongst different applications, software configuration files

Data
- Includes mixed data

Electronic Publishing
- Electronic publishing in this context does not mean the use of page layout applications but rather the development of content to meet the needs of different audiences and different output devices
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

• Create content that is well-formed, free of errors, meets the needs of the business and is extensible to meet future business needs. The XML / PPML file can be parsed and validates
• TWO different extensible markup language documents are created and are well-formed, free of errors, meet the needs of the business and are extensible to meet future business needs. Both the XML / PPML files can be parsed and validate
• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
• a standalone computer and markup language parser

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

• direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

• ICPMM492B Create an extensible style sheet
• ICPPP494B Develop document content and structure
• ICPPP485B Create a digital data template
ICPMM492B Create an extensible style sheet

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to create an extensible style sheet.

Employability Skills
This unit contains employability skills.

Prerequisite Unit(s)
ICAB4135B Create a simple mark-up language document to specification

Application of the Unit
This unit requires the individual to create extensible style sheets for electronic publishing or online documents including computer screens and handheld devices. The individual will incorporate the presentation and transformation requirements in the style sheets and templates.

For this unit the extensible style sheet transforms the XML / PPML into screen or print output while ICPMM491B Create an extensible document is the data-store.

Unit Sector
Multimedia

ELEMENT PERFORMANCE CRITERIA

1. Prepare the source document
   1.1 The source document is validated as free of errors
   1.2 The style and transformation requirements of the source document are confirmed
   1.3 Advanced styling requirements are confirmed as required
   1.4 The different media, display formats and target audience preferred platforms and abilities are confirmed
   1.5 The source document is prepared for the style sheet

2. Create the style sheet
   2.1 Multiple templates are designed and applied to the style sheet
   2.2 The style sheet is developed using the required presentation styles
   2.3 Transformation requirements are incorporated into several style sheets
   2.4 The style sheet is associated / linked with the source document and tested

3. Test the style sheet
   3.1 The style sheets are validated to ensure correct presentation and transformation
   3.2 The style sheet is updated if errors occur and validated again
   3.3 The style sheet is linked to a data-store and to a digital template and tested
   3.4 The style sheet is extensible to meet future business needs
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information applied by developing style sheets that use the required presentation styles
- Collecting, analysing and organising information by confirming the different media, display formats and preferred target audience platforms and abilities
- Planning and organising activities by preparing the source document prior to creating the style sheets
- Teamwork when maintaining the production process in association with others
- Mathematical ideas and techniques applied by confirming the style and transformation requirements of the source document
- Problem-solving skills applied by developing an extensible style sheet free of errors
- The use of technology applied by using industry software to create an extensible style sheet

Required knowledge:
The following knowledge must be assessed as part of this unit:

Document Style Semantics and Specification Language (DSSSL)
- Explain an application of DSSSL where it can be used to develop an extensible style sheet.

XSL
- How do Cascading Style Sheets (CSS) and XSL differ?
- What is the intended purpose of XSL?

HTML
- When would you use an extensible markup language over HTML and why?
- In what ways could you use both with the one set of data?

PPML
- How does Personalised Print Markup Language relate to XML?

Metadata and PRISM
- Provide a work-based example of the application of Metadata and / or PRISM.
- What are the essential differences between these functions?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Advanced styling requirements

• Headers, footers, page numbers and page number citations and other pagination semantics for print-oriented rendering for a range of measurements

Media

• Screen, paper or voice for example

Display formats

• HTML, PDF, Braille and typesetting languages

Markup language

• New languages markup languages are becoming available regularly and examples include XML and PPML. This unit does not cover HTML which is covered by another unit ICAB4135B Create a simple mark-up language document to specification

Document purpose

• Electronic publishing, e-commerce, web services, interchange of data amongst different applications, software configuration files

Style sheets

• This unit does not cover Cascading Style Sheets (CSS)

Electronic Publishing

• Electronic publishing in this context does not mean the use of page layout applications but rather the development of content to meet the needs of different audiences and different output devices
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Create extensible style sheets for electronic publishing or online documents
- For valid and reliable assessment of this unit, evidence should be gathered over a period of time through a range of methods for assessment to indicate consistent performance
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- industry standard software and relevant hardware

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPMM491B Create an extensible document
- ICPPP494B Develop document content and structure
- ICPPP485B Develop a digital data template
ICPMM581B Manage multimedia production

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to manage the multimedia production cycle.

Employability Skills

This unit contains employability skills.

Application of the Unit

This unit covers the skills required to manage the multimedia production cycle.

Unit Sector

Multimedia

ELEMENT PERFORMANCE CRITERIA

1. Design a production cycle for a multimedia product
   1.1 Management components of the production cycle are identified and coordinated to achieve a defined outcome
   1.2 Concepts for multimedia integration are posited and their sequence planned
   1.3 Prototype sequences are designed and tested according to job specifications
   1.4 Multimedia production is undertaken that conforms to product specifications
   1.5 The final product is tested for conformance to specifications and released to client

2. Define the attributes of interactive multimedia products
   2.1 The attributes of hypermedia are defined and incorporated into a given production
   2.2 The attributes of hypertext are defined and incorporated into a given production
   2.3 Linear and interactive information structures are distinguished and incorporated into a given production

3. Manage research
   3.1 Client specifications are researched and checked with client to deliver the desired outcome
   3.2 Files, documents, images and footage relevant to project requirements are sourced and their functions documented and sequenced
   3.3 Liaison with clients is undertaken, records of interviews kept, and specifications monitored within the management of the project to achieve the required outcomes
   3.4 Files, documents, images and footage relevant to specific projects are filed for future reference with regard for client confidentiality
4. Manage the multimedia process

4.1 The order of process procedure is determined and documented to deliver the desired outcome
4.2 Costs are determined, checked with client, and documented to deliver the desired outcome
4.3 Quality outcomes are determined and documented and a quality system is established to monitor the quality of the product
4.4 The product outcome is produced fit for the purpose
4.5 The product is tested against specifications prior to client release
4.6 Endorsement of the product by the client is gained to ensure specifications have been fulfilled

REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by liaising with clients
• Collecting, analysing and organising information by researching client specifications
• Planning and organising activities by identifying the production cycle
• Teamwork when liaising with clients
• Mathematical ideas and techniques by maintaining costs within budget
• Problem-solving skills by testing product to ensure it meets specifications
• Use of technology by working on a multimedia product

Required knowledge:
The following knowledge must be assessed as part of this unit:

Multimedia production cycle

• What are the management components of the production cycle?
• What considerations are involved in multimedia integration?
• What is involved in designing and testing prototype sequences?
• What is involved in multimedia product testing?

Interactive multimedia product attributes

• What are the attributes of hypermedia?
• What are the attributes of hypertext?
• What is the difference between linear and interactive information structures?

The multimedia production process

• What are the quality considerations of multimedia production?

Managing research

• How are files, documents, images and footage relevant to project requirements sourced?
• What steps are necessary to ensure good liaison with clients?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Degree of autonomy

- Managing multimedia production is undertaken in the workplace working independently and being able to cope with contingencies

Types of systems

- Multimedia systems used in the pre-press sector and associated sectors with which a pre-press organisation may be required to work

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Establish, monitor and evaluate a production cycle including the project management of all technical aspects of the project
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Produce a portfolio covering a period of THREE months' information on the management of TWO multimedia projects that demonstrates establishing, monitoring and evaluating a production cycle including using attributes of specific multimedia interactivity. The portfolio should include material that covers defined components of a production cycle, concepts for multimedia integration, prototype sequences and attributes, product testing and quality considerations
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.
## ICPMM582B Manage multimedia projects

### Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to manage multimedia projects.

### Employability Skills
This unit contains employability skills.

### Application of the Unit
This unit covers the management of multimedia projects.

### Unit Sector
Multimedia

### PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Develop a project plan | 1.1 The elements of the project plan are identified according to the principles of project management  
1.2 Planning tools are identified for application to the project  
1.3 Time and budget factors are identified and incorporated into the plan |
| 2. Manage resources and time | 2.1 Hardware resources relevant to specific multimedia tasks are identified, evaluated and incorporated to achieve the required outcome  
2.2 Time management is integrated into project planning and monitoring  
2.3 Human resources are incorporated and supported within the project framework to achieve the required outcome  
2.4 Teamwork elements are identified and developed to achieve the required outcome |
| 3. Identify legal issues | 3.1 Copyright principles and conventions relevant to digital data are identified and legal precedents noted  
3.2 The copyright issues relating to multimedia authoring, digital imaging and digital sound are explained and strategies are devised to account for relevant contingencies  
3.3 Copyright ownership of multimedia authoring, digital imaging and digital sound is established prior to commencing a brief and relevant documentation verified  
3.4 Applications of law with reference to multimedia product warranties, software licences, consultants, sponsors and distribution are determined appropriate for the job to be undertaken and relevant to the industry sector |
| 4. Manage research | 4.1 Files, documents, images and footage relevant to project requirements are sourced and their functions documented and sequenced  
4.2 Liaison with clients is undertaken, records of interviews kept, and specifications monitored within the management of the project to achieve the required outcomes  
4.3 Files, documents, images and footage relevant to specific projects are filed for future reference with regard for client confidentiality |
5. Determine and manage multimedia budgets

5.1 Estimation models of costs are identified and applied to a range of multimedia products

5.2 Budget plans are established and checked against estimations to deliver accurate costings

5.3 Tendering processes and costs are determined and implemented to deliver the required outcome within designated time frames and costs

5.4 Project costs are determined, documented and monitored continuously to comply with business commitments and legal obligations

5.5 Business transactions are undertaken ethically and according to law

5.6 Multimedia project budget estimates and expenditure are contrasted and documented to assist in future business dealings

6. Manage project outcomes

6.1 Multimedia inputs are combined to form a definitive master

6.2 The master product is duplicated and distributed according to client specifications

6.3 The project outcomes are refined to meet quality standards
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by explaining copyright issues
• Collecting, analysing and organising information by identifying legal issues
• Planning and organising activities by developing a project plan
• Teamwork when liaising with clients and identifying teamwork elements
• Mathematical ideas and techniques by determining a budget
• Problem-solving skills by ensuring projects meet client specifications
• Use of technology by working on multimedia projects

Required knowledge:
The following knowledge must be assessed as part of this unit:

Developing a project plan
• What elements need to be included in a multimedia project plan?
• How are time and budget factors incorporated into a project plan?

Managing resources and time
• What hardware resources are relevant to specific multimedia tasks?
• How is time management integrated into project planning and monitoring?
• How are human resources incorporated and supported within the project framework?
• What teamwork elements should be implemented in a project plan?

Managing research
• How are files, documents, images and footage relevant to project requirements sourced?
• What steps are necessary to ensure good liaison with clients?

Managing project outcomes
• How is the multimedia master created?
• How is the master duplicated and distributed?

Legal issues
• What legal issues apply to multimedia production?
• What copyright principles and conventions are relevant to digital data?
• What are the copyright issues relating to multimedia authoring, digital imaging and digital sound?
• Who owns copyright of multimedia authoring, digital imaging and digital sound?
• What laws apply to multimedia product warranties, software licences, consultants, sponsors and distribution?

Multimedia budgets
• What estimation models might be used in multimedia production?
• What constitutes a budget plan?
• What is involved in tendering processes?
• How are project costs calculated?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Degree of autonomy

• Managing multimedia projects is undertaken in the workplace working independently and being able to cope with contingencies

Types of systems

• Multimedia systems used in the pre-press sector and associated sectors with which a pre-press organisation may be required to work

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

• Manage a multimedia project including establishing, monitoring and evaluating a production cycle and using attributes of specific multimedia interactivity
• Demonstrate an ability to find and use information relevant to the task from a variety of information sources
• Produce a portfolio that demonstrates multimedia project management including establishing, monitoring and evaluating a production cycle and using attributes of specific multimedia interactivity over TWO different completed projects. The portfolio should include material that covers planning tools, time and budget factors, resource management, time management, human resources, teamwork, research management and a multimedia master
• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.
ICPPR211B Mount and proof flexographic plates for basic printing

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to mount and proof flexographic plates for routine printing.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to prepare and mount flexographic plates and plate cylinders. Plates are proofed and cylinders are checked for registration.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Confirm routine job specifications
   1.1 Job requirements are read and interpreted from job documentation or production control system
   1.2 Set up is carried out correctly in minimum time with minimum wastage
   1.3 Prior inspections are completed and signed off

2. Prepare flexographic plates
   2.1 Plate height and relief are measured
   2.2 Plates are trimmed and prepared according to mounting system requirements
   2.3 Mounting adhesive is selected to achieve correct PCD (Pitch Circle Diameter) of specified plate cylinders and gears

3. Prepare plate cylinders
   3.1 Plate cylinders / seamless sleeves are selected, cleaned and prepared and correct gears are mounted
   3.2 Sleeves and correct gears on mandrels are selected, cleaned, prepared and mounted to meet routine job specifications
   3.3 TIR (Total Indicated Runout) is checked to be within specified tolerances on plate cylinders
   3.4 Selected mounting adhesive is applied to plate cylinders

4. Mount and/or proof flexographic plates on mounting/proofing machine
   4.1 Plates are prepared and mounted on cylinders using pin mount or microdot systems or sleeves according to chart number / print direction OR
   4.2 Plate mounting sheet is prepared to meet routine job specifications AND
   4.3 Plates are mounted to position on plate mounting sheet or camera targets AND
   4.4 Plate mounting sheet is installed and tensioned onto plate cylinder to specified chart number / print direction
   4.5 Plates are proofed and each plate cylinder is checked for register
   4.6 Flexographic plates are trimmed and taped down according to printing press requirements
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting job tickets and requirements
- Collecting, analysing and organising information by collecting and assessing data about printing process and machine specifications and characteristics and how these interact
- Planning and organising activities by providing input into production scheduling about time requirements for set up to ensure efficient operation
- Teamwork when working with other workers to coordinate set up to ensure efficient operation
- Mathematical ideas and techniques by calculating plate position
- Problem-solving skills by recognising proofing faults and determining adjustments to correct them
- Use of technology by using monitoring equipment and interpreting readouts

Required knowledge:
The following knowledge must be assessed as part of this unit:

Job requirements

- What would you do if vital information was missing from the job ticket?
- What checks were undertaken prior to set up (availability of materials etc.)?

Flexographic printing plates and mounting systems

- What OHS concerns are there when mounting and proofing plates?
- How were the correct plates chosen for the job?
- When would cushion type mounting material be used?
- How can damage to the plate be avoided when mounting plates?
- What options are available to seal the edges of plates when mounting?
- Why is it important to measure plate height?
- How can TIR affect press performance?
- What does the term V-block mounting mean?
- How is V-block mounting achieved?

Proofing and adjustment

- What procedures are followed to have the print approved?
- What quality control measurements should be applied to the proof to test against known standards?
- What do you check on the initial print prior to running?
- How are the final results recorded for future reference?
- How can you minimise registration errors?

Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
• Range of standard inks commonly used in 1-2 colour printing

Colour matching systems
• Use of visual colour assessment and densitometry to match basic standard colours under controlled lighting conditions

Types of plates
• Range of plate thicknesses used in flexography
• Range of mounting adhesives

Machines
• A range of stack, in-line and central impression flexographic printing machines with various plate cylinder drives and mounting systems

Design
• Colours, simple graphics and text. Minor variation in registration and position

Jobs
• Surface prints

Degree of autonomy
• Working to defined procedures under limited supervision

Routine
• Routine within this context relates to the set up and production of print runs that involve routine set up and routine production. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Prepare and mount flexographic plates and plate cylinders. Produce print direction chart and check registration, if necessary
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Mount and proof flexographic plates on TWO occasions for basic jobs, according to enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- flexographic printing machines, pin mounted or microdot mounting systems, print direction chart

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR313B Set up for basic flexographic printing
- ICPPR314B Produce basic flexographic printed product
ICPPR214B Produce basic flexographic printed product

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to produce a basic flexographic printed product.

Employability Skills

This unit contains employability skills.

Application of the Unit

This unit requires the individual to operate either a reel or sheet-fed flexographic press ensuring an efficient routine production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector

Printing

ELEMENT PERFORMANCE CRITERIA

1. Maintain routine operation of reel system (OR Element 2)

1.1 Reel stand and rewind sections are monitored and adjusted to ensure efficient continuous operation and maintain correct tension and to ensure no marks, blemishes or damage to finished product

1.2 Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation

1.3 Substrate is added and removed to process according to job instructions

1.4 Sheeting action is monitored and adjusted to ensure quality and efficient product delivery

1.5 Set-off / marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof

2. Maintain routine operation of sheet system (OR Element 1)

2.1 Feeder and delivery are monitored and adjusted to ensure continuous and efficient feeding and delivery to and from machine

2.2 Sheet pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operation

2.3 Transfer systems are monitored and adjusted to ensure correct and continuous sheet handling and efficient operation

2.4 Set-off / marking prevention system is monitored and adjusted to ensure quality of printed product meets the standard of approved proof

2.5 Substrate is added to process according to job instructions
3. Maintain basic flexographic printing process

3.1 Flexographic plate and plate cylinder or sleeve condition is monitored and adjusted to ensure the quality of printed product meets the standard of the approved proof

3.2 Flexographic impression roller condition is monitored to ensure the quality of printed product meets the standard of approved proof

3.3 Flexographic inking system and doctor blade are monitored and adjusted to ensure quality of printed product meets the standard of approved proof

3.4 Drying systems are monitored and adjusted to ensure quality of printed product meets the standard of approved proof

3.5 Basic in-line printing / converting / binding / finishing process(es) are monitored and adjusted to ensure quality of printed product meets the standard of approved proof

4. Maintain routine production process

4.1 Production process is operated in association with fellow workers and according to enterprise procedures and planned daily schedule

4.2 Production is maintained according to OHS requirements, manufacturer's specifications and enterprise procedures

4.3 Manual and / or automatic control is used according to job specifications

4.4 Performance is monitored and verified using the process control system according to enterprise procedures

4.5 Ink performance, colour, register and position of print are monitored and adjusted throughout production run

4.6 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention

4.7 Process adjustments to eliminate problems are reported according to enterprise procedures

4.8 Faulty performance of equipment is identified and reported according to enterprise procedures

4.9 Waste is sorted according to enterprise procedures

5. Identify and rectify faults

5.1 Problem in flexographic machine operation is identified and reported according to enterprise procedures

5.2 Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level

5.3 Flexographic machine operation is checked to ensure correct operation

5.4 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures
6. Conduct shutdown of production process

   6.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures

   6.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

   6.3 Reels and cores are removed from press if web-fed

   6.4 Unused ink is drained back to containers and correctly labelled and stored according to manufacturer’s / supplier's specifications and enterprise procedures

   6.5 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

   6.6 All product is removed from operating area

7. Clean and wash up printing machine at end of print run

   7.1 Cylinders or sleeves, plate and roller surfaces are cleaned ready for next run

   7.2 Inking rollers and doctor blades or chamber blade systems are cleaned with correct solvents according to OHS guidelines

   7.3 Ink pumps, tanks and hoses are cleaned correctly

   7.4 Impression rollers / central impression and press rollers are cleaned

   7.5 In-line printing / converting / binding / finishing units are cleaned ready for next run

   7.6 Reel or sheet-feed transportation and delivery systems are disengaged and cleaned ready for next run

   7.7 Press is lubricated and protected according to duration of shutdown

   7.8 Production records or other documentation are accurately completed where required by enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by providing feedback to internal and external clients about printing, in-line processes and job specifications
- Collecting, analysing and organising information by collating details of job and machine specifications and printing processes to ensure efficient production
- Planning and organising activities by coordinating sequences for printing and wash-up
- Teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production
- Mathematical ideas and techniques by calculating consumables requirements
- Problem-solving skills by identifying print problems and correcting during print run
- Use of technology by using monitoring systems, understanding their output and feeding into production management systems

Required knowledge:
The following knowledge must be assessed as part of this unit:

Reel transportation and delivery
- What OHS concerns are there when loading and handling heavy reels?
- How is the printing side of the substrate determined?
- What would be the effect on the print of excessive tension on the unwinding reel?
- What can happen if the web is not spliced correctly?

Sheet transportation and delivery
- What OHS factors need to be considered when operating the sheet transportation and delivery systems?
- Why are the sheets fanned before loading into the press?
- Why is it important that the double sheet detector be set and checked during the print run?
- What will happen if the web is not spliced correctly?
- What components can be adjusted to ensure correct delivery?
- What effect could excessive suction on the slow-down wheels have?

Flexographic printing operations
- How frequently should the quality of the product be assessed?
- What could be done if the print was filling in when printing?
- What effect would dirt under the doctor blade have on the print?
- Why does the doctor blade oscillate?
- What action can be taken if the ink in the duct is foaming?
- What are the signs of wear in the image area of the plate?

In-line processes
- What are the OHS concerns for the in-line component of the press?
- How frequently should the in-line components of the job be examined?

Quality control and problem solving
• What should be monitored to ensure quality?
• What precautions should be taken to ensure that the rewound product is of consistent acceptable quality?
• How is printed material that is not of an acceptable standard identified?
• How is product that is deemed unacceptable by the operator marked?
• Who would be consulted if there was a problem with the print that was not able to be fixed by the operator?
• Where can information concerning the correct operation of the machine be found?

Shut down and wash up the press
• What dangers exist from solvents and solutions used to clean the inking system, plate and the press?
• What methods are used to ensure proper storage of the plates following printing?
• What parts of the machine should be thoroughly cleaned following the print run?
• What components are to be inspected for wear following the print run?
• What records are important for following or repeat prints?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
• Range of standard inks commonly used in 4-colour printing

Colour matching systems
• Use of visual colour assessment and densitometry to match basic standard colours under controlled lighting conditions

Machines
• A range of stack, in-line and central impression flexographic printing machines with manual, semi-automated, fully automated or computerised process control

Design
• 4 colours, simple graphics and text. Minor variation in registration and position
In-line processes

- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g., flat-bed cutting, folding) it should be assessed as such.

Substrate types

- Range of substrates within the major categories of paper, pressure sensitive material, board, corrugated board, plastics and related films, or metal

Substrate handling

- Wide or narrow reel or large or small sheet handling systems

Degree of autonomy

- Working to defined procedures under limited supervision

Routine

- Routine within this context relates to the set up and production of print runs. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Operate either a reel or sheet-fed flexographic press ensuring an efficient production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
- Produce TWO basic flexographic printing jobs (if possible including at least ONE in-line process) according to job specifications, enterprise procedures and the Performance Criteria.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- flexographic press

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPSU201B Prepare, load and unload reels and cores on and off machine
- ICPSU202B Prepare, load and unload product on and off machine
- ICPSU208B Operate and monitor machines (basic)
- ICPPR211B Mount and proof flexographic plates for basic printing
- ICPPR313B Set up for basic flexographic printing
ICPPR222B Produce basic gravure printed product

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to produce routine gravure printed product.

Employability Skills

This unit contains employability skills.

Application of the Unit

This unit requires the individual to operate a gravure press ensuring an efficient production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector

Printing

ELEMENT

PERFORMANCE CRITERIA

1. Maintain routine operation of reel system
   1.1 Reel stand and rewind section are is monitored and adjusted to ensure efficient continuous operation and to maintain correct tension and to ensure no marks, blemishes or damage to finished product
   1.2 Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation
   1.3 Substrate is added to and remove from process according to job instructions
   1.4 Sheeting section is monitored and adjusted to ensure quality and efficient product delivery
   1.5 Set-off / marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof

2. Maintain basic gravure printing process
   2.1 Gravure cylinder condition is monitored and adjusted to ensure the quality of printed product meets the standard of the approved proof
   2.2 Gravure impression roller condition is monitored and maintained to ensure the quality of printed product meets the standard of approved proof
   2.3 Gravure inking system and doctor blade are monitored and adjusted to ensure quality of printed product meets the standard of approved proof
   2.4 Drying systems are monitored and adjusted to ensure quality of printed product meets the standard of approved proof
   2.5 Basic in-line printing / converting / binding / finishing process(es) are monitored and adjusted to ensure quality of product meets the standard of the approved proof
3. Maintain routine production process

3.1 Production process is operated in association with fellow workers and according to company specifications and planned daily schedule

3.2 Production is maintained within OHS requirements and company and manufacturer's specifications

3.3 Manual and / or automatic control is used as per specification

3.4 Performance is monitored and verified using the process control system according to enterprise procedures

3.5 Ink performance, colour, register and position of print are monitored and adjusted throughout production run

3.6 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention

3.7 Process adjustments to eliminate problems are reported according to enterprise procedures

3.8 Waste is sorted according to enterprise procedures

4. Identify and rectify faults

4.1 Problem in gravure machine operation is identified and reported according to enterprise procedures

4.2 Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level

4.3 Gravure machine operation is checked to ensure correct operation

4.4 Faulty performance of equipment is identified and reported according to enterprise procedures

5. Conduct shutdown of production process

5.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures

5.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

5.3 Unused ink is correctly labelled and stored according to manufacturer / supplier specifications and enterprise procedures

5.4 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

5.5 All product is removed from operating area

5.6 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures

5.7 Repair / adjustment is verified prior to resumption of operations
6. Clean and wash up printing machine at end of print run

6.1 Cylinders and roller surfaces are cleaned ready for next run
6.2 Inking system is washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements
6.3 In-line printing / converting / binding / finishing units are cleaned ready for next run
6.4 Reel feed, transportation and delivery systems are disengaged and cleaned ready for next run
6.5 Production records or other documentation are accurately completed where required by enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by providing feedback to internal and external clients about printing and in-line processes and job specifications
• Collecting, analysing and organising information by collating details of job and machine specifications and printing processes to ensure efficient production
• Planning and organising activities by coordinating sequences for printing and wash-up
• Teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production
• Mathematical ideas and techniques by calculating consumables requirements
• Problem-solving skills by identifying print problems and correcting during print run
• Use of technology by using monitoring systems, understanding their output and feeding into production management systems

Required knowledge:
The following knowledge must be assessed as part of this unit:

Reel transportation and delivery
• What OHS concerns are there when loading and handling heavy reels?
• How is the printing side of the substrate determined?
• What would be the effect on the print of excessive tension on the rewinding reel?
• What will happen if the web is not spliced correctly?

Gravure printing operations
• How frequently should the quality of the product be assessed?
• What could be done if the print was filling in when printing?
• What effect would dirt under the doctor blade have on the print and the cylinder?
• Why does the doctor blade oscillate?
• How would a nick in the doctor blade be addressed?
• What action can be taken if the ink in the duct is foaming?
• What are the signs of wear in the image area of the plate?
• At what level should the ink level be maintained?

In-line processes
• What are the OHS concerns for the in-line component of the press?
• How frequently should the in-line components of the job be examined?

Quality control and problem solving
• What precautions should be taken to ensure that the rewound product is of consistent acceptable quality?
• How is printed material that is not of an acceptable standard identified?
• What should be monitored to ensure quality?
• How is product that is deemed unacceptable by the operator marked?
• Who would be consulted if there were a problem with the print that was not able to be fixed by the operator?
• Where can information concerning the correct operation of the machine be found?
Shut down and wash up the press

- What dangers exist from solvents and solutions used to clean the inking system, cylinder and the press?
- What methods are used to ensure proper storage of the cylinders following printing?
- What parts of the machine should be thoroughly cleaned following the print run?
- What components are to be inspected for wear following the print run?
- What records are important for following or repeat prints?

Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings

- Range of standard inks commonly used in 1-2 colour printing

Colour matching systems

- Use of visual colour assessment and densitometry to match basic standard colours under controlled lighting conditions

Machines

- A range of in-line gravure printing machines with manual, semi-automated, fully automated or computerised process control

Design

- 1-2 colours, simple graphics or text, minor variations in registration and position

In-line processes

- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such

Substrate types

- Range of substrates within the major categories of paper, board, plastics and related films, or metal

Substrate handling

- Wide or narrow reel handling systems
Degree of autonomy

- Working to defined procedures under limited supervision

Routine

- Routine within this context relates to the set up and production of print runs. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Operate a gravure press ensuring an efficient routine production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Produce TWO basic gravure printing jobs (if possible including at least ONE in-line process) according to job specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- gravure printing machine with in-line processes
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPSU201B Prepare, load and unload reels and cores on and off machine
- ICPSU208B Operate and monitor machines (basic)
- ICPPR321B Set up for basic gravure printing
ICPPR232B Produce basic lithographic printed product

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to produce basic lithographic printing, including small offset product.

Employability Skills

This unit contains employability skills.

Application of the Unit

This unit requires the individual to operate a lithographic press ensuring an efficient routine production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector

Printing

ELEMENT PERFORMANCE CRITERIA

1. Maintain routine operation of reel system (OR Element 2)
   1.1 Reel stand and rewind section are monitored and adjusted to maintain correct tension and to ensure no marks or blemishes to finished product and to ensure efficient continuous operation
   1.2 Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation
   1.3 Substrate is added to and removed from process according to job instructions
   1.4 Sheeting section is monitored and adjusted to ensure quality and efficient product delivery

2. Maintain routine operation of sheet system (OR Element 1)
   2.1 Feeder and delivery sections are monitored and adjusted to ensure continuous and efficient feeding to machine
   2.2 Sheet pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operation
   2.3 Transfer systems are monitored and adjusted to ensure correct and continuous sheet handling and efficient operation
   2.4 Substrate is added to and removed from process according to job instructions
### 3. Maintain basic routine lithographic printing process

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Lithographic plate and plate cylinder condition is monitored and adjusted to ensure the quality of printed product meets the standard of the approved proof</td>
</tr>
<tr>
<td>3.2</td>
<td>Lithographic blanket and blanket cylinder condition is monitored and adjusted to ensure the quality of printed product meets the standard of approved proof</td>
</tr>
<tr>
<td>3.3</td>
<td>Lithographic impression cylinder condition is monitored and adjusted to ensure quality of printed product meets the standard of approved proof</td>
</tr>
<tr>
<td>3.4</td>
<td>Lithographic inking condition is checked and maintained to ensure quality of printed product meets the standard of approved proof</td>
</tr>
<tr>
<td>3.5</td>
<td>Lithographic dampening system condition is monitored and adjusted maintained to ensure quality of printed product meets the standard of approved proof</td>
</tr>
</tbody>
</table>

### 4. Maintain routine production process

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Production process is operated in association with fellow workers and according to company specifications and planned daily schedule</td>
</tr>
<tr>
<td>4.2</td>
<td>Production is maintained within OHS requirements and company and manufacturer's specifications</td>
</tr>
<tr>
<td>4.3</td>
<td>Manual and / or automatic control is used as per specification</td>
</tr>
<tr>
<td>4.4</td>
<td>Performance is monitored and verified according to enterprise procedures</td>
</tr>
<tr>
<td>4.5</td>
<td>In performance, colour, register and position of print are monitored and adjusted maintained throughout production run</td>
</tr>
<tr>
<td>4.6</td>
<td>Faulty performance of equipment is identified and reported according to enterprise procedures</td>
</tr>
<tr>
<td>4.7</td>
<td>Waste is sorted according to enterprise procedures</td>
</tr>
</tbody>
</table>

### 5. Rectify minor lithographic machine faults

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level</td>
</tr>
<tr>
<td>5.2</td>
<td>Problems with lithographic machine operation is identified and reported according to enterprise procedures</td>
</tr>
<tr>
<td>5.3</td>
<td>Lithographic machine operation is checked to ensure correct operation</td>
</tr>
</tbody>
</table>
6. Conduct shutdown of production process
   6.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures
   6.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements
   6.3 Unused ink is correctly labelled and stored according to manufacturer / supplier specifications and enterprise procedures
   6.4 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures
   6.5 All product is removed from operating area
   6.6 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures
   6.7 Repair / adjustment is verified prior to resumption of operations

7. Clean and wash up printing machine at end of print run
   7.1 Cylinders, plate and roller surfaces are cleaned ready for next run
   7.2 Inking system and dampening system are washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements
   7.3 In-line printing / converting / binding / finishing units are cleaned ready for next run
   7.4 Reef Reel-fed, transportation and delivery systems are disengaged and cleaned ready for next run
   7.5 Sheet feed, transport and delivery system are disengaged and cleaned ready for next run
   7.6 Production records or other documentation are accurately completed where required by enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by providing feedback to internal and external clients about printing, in-line processes and job specifications
• Collecting, analysing and organising information by collating details of job and machine specifications and printing processes to ensure efficient production
• Planning and organising activities by coordinating sequences for printing and wash-up
• Teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production
• Mathematical ideas and techniques by calculating consumables requirements
• Problem-solving skills by identifying print problems and correcting during print run
• Use of technology by using monitoring systems, understanding their output and feeding into production management systems

Required knowledge:

The following knowledge must be assessed as part of this unit:

Reel or sheet transportation and delivery

• What OHS concerns are there when loading and handling heavy reels?
• Why are the sheets fanned before loading into the press?
• Why is it important that the double sheet detector be set and checked during the print run?
• What would be the effect on the print of excessive tension on the rewinding reel?
• What will happen if the web is not spliced correctly?
• If sheeted, what components can be adjusted to ensure correct delivery?
• What effect could excessive suction on the slow-down wheels have?

Lithographic printing operations

• What could be done if the non-image area of the print was scumming when printing?
• What could cause emulsification while printing on a lithographic printing press?
• What are the signs of wear in the image area of the plate?
• At what level should the ink level be maintained?

In-line processes

• What are the OHS concerns for the in-line components of the press?
• How frequently should the in-line components of the job be examined?

Quality control and problem solving

• What precautions should be taken to ensure that the rewound product is of consistent acceptable quality?
• How is printed material that is not of an acceptable standard identified?
• How frequently should the quality of the product be assessed?
• How is product that is deemed unacceptable by the operator marked?
• What should be monitored to ensure quality?
• Who would be consulted if there were a problem with the print that was not able to be fixed by the operator?
• Where might you find information concerning the correct operation of the machine?

**Shutdown and wash-up of the press**

• What dangers exist from solvents and solutions used to clean the inking system, plates, cylinders and the press?
• What effect could excessive gum have on the plate image?
• What parts of the machine should be thoroughly cleaned following the print run?
• What components are to be inspected for wear following the print run?
• What records are important for following or repeat prints?

**Information sources**

• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents

**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

**Inks / coatings**

• Range of standard inks commonly used in printing

**Colour matching systems**

• Use of visual colour assessment and matching under controlled lighting conditions

**Machines**

• A range of single sheet, stream and reel-fed machines with manual, semi-automated, fully automated or computerised process control

**Design**

• Simple graphics and text. Minor variation in registration and position

**In-line processes**

• Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g., flat-bed cutting, folding) it should be assessed as such

**Substrate types**

• Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal
Substrate handling  
• Wide or narrow reel or large or small sheet handling systems

Degree of autonomy  
• Working to defined procedures under limited supervision

Routine  
• Routine within this context relates to the set up and production of print runs. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

• Routine within this context relates to the set up and production of print runs. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis

• Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate

• Demonstrate an ability to find and use information relevant to the task from a variety of information sources

• Produce TWO basic lithographic printing jobs (if possible including at least ONE in-line process) according to job specifications, enterprise procedures and the Performance Criteria

• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment

• lithographic printing machine
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPSU201B Prepare, load and unload reels and cores on and off machine
- ICPSU202B Prepare, load and unload product on and off machine
- ICPSU208B Operate and monitor machines (basic)
- ICPPR331B Set up for basic lithographic printing
ICPPR242B Produce basic pad printed product

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce basic pad printing product.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to operate a pad printing machine ensuring an efficient routine production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector
Printing

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Maintain routine pad printing process</td>
<td>1.1 Location of objects into fixtures is monitored and adjusted if necessary&lt;br&gt;1.2 Printing plate condition is monitored to ensure the quality of printed product meets the standard of the approved proof&lt;br&gt;1.3 Printing pad condition is monitored and maintained to ensure the quality of printed product meets the standard of approved proof&lt;br&gt;1.4 Spatula and doctor blade are monitored and adjusted to ensure quality of printed product meets the standard of approved proof OR&lt;br&gt;1.5 Ink cup is monitored and adjusted to ensure quality of printed product meets the standard of approved proof&lt;br&gt;1.6 Printing ink viscosity is monitored and adjusted to ensure quality of printed product meets the standard of approved proof</td>
</tr>
<tr>
<td>2. Maintain manual pre- and post-treatments</td>
<td>2.1 Manual loading is monitored and adjusted to ensure quality of printed product meets the standard of approved proof&lt;br&gt;2.2 Manual pre-treatment is monitored and adjusted to ensure quality of printed product meets the standard of approved proof&lt;br&gt;2.3 Drying racks are monitored and adjusted to ensure quality of printed product meets the standard of approved proof</td>
</tr>
</tbody>
</table>
3. Maintain routine production process

3.1 Production process is operated in association with fellow workers and according to company specifications and planned daily schedule

3.2 Production is maintained within OHS requirements and company and manufacturer’s specifications

3.3 Manual and / or automatic control is used as per specification

3.4 Performance is monitored and verified using the process control system according to enterprise procedures

3.5 Ink performance, colour, register and position of print are monitored and adjusted throughout production run

3.6 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention

3.7 Process adjustments to eliminate problems are reported according to enterprise procedures

3.8 Waste is sorted according to enterprise procedures

4. Identify and rectify faults

4.1 Problem in pad printing machine operation is identified and reported according to enterprise procedures

4.2 Adjustments or corrections are carried out according to specified procedures and consistent with operator’s skill level

4.3 Pad printing machine operation is checked to ensure correct operation

4.4 Faulty performance of equipment is identified and reported according to enterprise procedures

5. Conduct shutdown of production process

5.1 Correct shutdown sequence is followed according to manufacturer’s specifications and enterprise procedures

5.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

5.3 Unused ink is correctly labelled and stored according to manufacturer / supplier specifications and enterprise procedures

5.4 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

5.5 All product is removed from operating area

5.6 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures

5.7 Repair / adjustment is verified prior to resumption of operations

6. Clean and wash up printing machine at end of print run

6.1 Plates and pads are cleaned ready for next run

6.2 Inking system is washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements

6.3 Pre- and post-treatment units are cleaned ready for next run

6.4 Production records or other documentation are accurately completed where required by enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by providing feedback to internal and external clients about printing, in-line processes and job specifications
• Collecting, analysing and organising information by collating details of job and machine specifications and printing processes to ensure efficient production
• Planning and organising activities by coordinating sequences for printing and wash-up
• Teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production
• Mathematical ideas and techniques by calculating consumables requirements
• Problem-solving skills by identifying print problems and correcting during print run
• Use of technology by using monitoring systems, understanding their output and feeding into production management systems

Required knowledge:
The following knowledge must be assessed as part of this unit:

OHS
• What are the major OHS concerns when operating this machine?
• Where are the MSDSs stored and what information do they contain?

Different machine cycle modes
• Explain how the colour density of a light image on a dark substrate can be improved by selection of a different machine cycle mode.
• How do you select the appropriate machine cycle mode to provide the highest production output for a particular product?

Inks
• How do you determine that ink has been mixed to the correct viscosity?
• How do you correct ink viscosity during production?
• What are TWO causes of unreleased ink remaining on the printing pad and how do you identify them?

Pads
• How do you recognise a damaged pad?
• What is the correct method of cleaning a pad during production?

Pre- and post-treatment requirements
• What simple pre-treatment is commonly required for injection-moulded objects?
• How long should the ink on this job take to cure before scratch and adhesion tests can be performed?

Print problem identification and correction
• Describe FOUR effects that will be visible in the image if the ink viscosity is incorrect.
• How do you adjust the machine to correct a shift in the image position on the product?
Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
- Range of standard inks commonly used in single colour printing

Colour matching systems
- Use of visual colour assessment to match basic standard colours under controlled lighting conditions

Machines
- A range of pad printing machines with manual, semi-automated or computerised operation

Design
- Single colour, simple graphics and text. Minor variations in registration and position

Pre and post-treatment processes
- Range of pre- and post-treatment processes commonly used in pad printing

Substrate types
- Range of substrates within the major categories of paper, wood, glass (ceramics), plastics, metal

Substrate handling
- Manual handling

Manual handling
- Working to defined procedures under limited supervision

Routine
- Routine within this context relates to the set up and production of print runs. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis.
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

• Operate a pad printing machine ensuring an efficient 1-colour production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
• Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
• Demonstrate an ability to find and use information relevant to the task from a variety of information sources
• Produce TWO basic pad printing jobs (if possible on different substrates) to meet job specifications, enterprise procedures and the Performance Criteria
• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
• a pad printing machine

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

• direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

• ICPSU202B Prepare, load and unload product on and off machine
• ICPSU208B Operate and monitor machines (basic)
• ICPPR341B Set up for basic pad printing
ICPPR252B Produce basic relief printed product

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce basic relief printed product.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to operate a platen, cylinder or rotary printing machine ensuring an efficient routine production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Maintain operation of reel system (OR Element 2)
   1.1 Reel stand and rewind section is monitored and adjusted to maintain correct tension and to ensure no marks or blemishes to finished product and to ensure efficient continuous operation
   1.2 Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation
   1.3 Substrate is added to and removed from process according to job instructions
   1.4 Sheeting section is monitored and adjusted to ensure quality and efficient product delivery
   1.5 Set off / marking prevention system is monitored and adjusted to ensure quality of printed product meets the standard of the approved proof

2. Maintain operation of sheet system (OR Element 1)
   2.1 Feeder and delivery sections are is monitored and adjusted to ensure continuous and efficient feeding to machine
   2.2 Sheet pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operation
   2.3 Transfer systems are monitored and adjusted to ensure correct and continuous sheet handling and efficient operation
   2.4 Substrate is added to and removed from the process according to job instructions
   2.5 Set off / marking prevention system is monitored and adjusted to ensure quality of printed product meets the standard of the approved proof
3. Maintain basic routine relief printing process

3.1 Relief forme or plate cylinder condition is monitored and adjusted to ensure the quality of printed product meets the standard of the approved proof

3.2 Relief impression surface condition is monitored and adjusted to ensure the quality of printed product meets the standard of approved proof

3.3 Relief inking system is monitored and adjusted to ensure quality of printed product meets the standard of approved proof

4. Maintain routine production process

4.1 Production process is operated in association with fellow workers and according to company specifications and planned daily schedule

4.2 Production is maintained within OHS requirements and company and manufacturer’s specifications

4.3 Manual and / or automatic control is used as per specification

4.4 Performance is monitored and verified using the process control system according to enterprise procedures

4.5 Ink performance, colour, register and position of print are monitored and adjusted throughout production run

4.6 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention

4.7 Process adjustments to eliminate problems are reported according to enterprise procedures

4.8 Waste is sorted according to enterprise procedures

5. Identify and rectify problems

5.1 Waste is sorted according to enterprise procedures

5.2 Problem in relief machine operation is identified and reported according to enterprise procedures

5.3 Adjustments or corrections are carried out according to specified procedures and consistent with operator’s skill level

5.4 Relief machine operation is checked to ensure correct operation

6. Conduct shutdown of production process

6.1 Relief machine operation is checked to ensure correct operation

6.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

6.3 Unused ink is correctly labelled and stored according to manufacturer / supplier specifications and enterprise procedures

6.4 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

6.5 All product is removed from operating area

6.6 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures

6.7 Repair / adjustment is verified prior to resumption of operations
7. Clean and wash up printing machine at end of print run

7.1 Cylinders, plate and roller surfaces are cleaned ready for next run

7.2 Inking system is washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements

7.3 In-line printing / converting / binding / finishing units are cleaned ready for next run

7.4 Reel feed, transportation and delivery systems are disengaged and cleaned ready for next run

7.5 Sheet feed, transport and delivery systems are disengaged and cleaned ready for next run

7.6 Production records or other documentation are accurately completed where required by enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by providing feedback to internal and external clients about printing processes and job specifications
- Collecting, analysing and organising information by collating details of job and machine specifications and printing processes to ensure efficient production
- Planning and organising activities by coordinating sequences for printing and wash-up
- Teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production
- Mathematical ideas and techniques by calculating consumables requirements
- Problem-solving skills by identifying print problems and correcting during print run
- Use of technology by using monitoring systems, understanding their output and feeding into production management systems

Required knowledge:
The following knowledge must be assessed as part of this unit:

Reel or sheet transportation and delivery

- What OHS concerns are there when loading and handling heavy reels?
- Why are the sheets fanned before loading into the press?
- Why is it important that the double sheet detector be set and checked during the print run?
- Why is the tracking of the web important to position and register?
- What will happen if the web is not spliced correctly?
- If sheeted, what components can be adjusted to ensure correct delivery?
- What effect could excessive suction on the slow-down wheels have?

Relief printing operations

- How frequently should the quality of the product be assessed?
- What would be the possible cause of a halo effect on the relief print?
- What are the signs of wear in the image area of the plate?
- How is product that is deemed unacceptable by the operator marked?
- At what level should the ink level be maintained?

In-line processes

- What are the OHS concerns for the in-line components of the press?
- How frequently should the in-line components of the job be examined?

Quality control and problem solving

- What precautions should be taken to ensure that the rewound product is of consistent acceptable quality?
- How is printed material that is not of an acceptable standard identified?
- What should be monitored to ensure quality?
- What action could be taken if mild set off was found on the back of the print?
- Who would be consulted if there were a problem with the print that could not be fixed by the operator?
Where can information concerning the correct operation of the machine be found?

**Shut down and wash up the press**
- What dangers exist from solvents and solutions used to clean the inking system, plates, cylinders and the press?
- How should plates be stored following printing?
- What parts of the machine should be thoroughly cleaned following the print run?
- What components should be inspected for wear following the print run?
- What records are important for following or repeat prints?

**Information sources**
- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?

**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

**Inks / coatings**
- Range of standard inks commonly used in 1-2 colour printing

**Colour matching systems**
- Use of visual colour assessment and densitometry to match basic standard colours under controlled lighting conditions

**Machines**
- A range of platen, cylinder and rotary printing machines with manual, semi-automated, fully automated or computerised process control

**Design**
- 1-2 colours, simple graphics and text. Minor variation in registration and position

**In-line processes**
- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such

**Substrate types**
- Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal
Substrate handling

- Wide or narrow reel or large or small sheet handling systems

Degree of autonomy

- Working to defined procedures under limited supervision

Routine

- Routine within this context relates to the set up and production of print runs. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Operate a platen, cylinder or rotary printing machine ensuring an efficient routine production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Produce TWO basic relief printing jobs (if possible including at least ONE in-line process) according to manufacturer's and job specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPSU201B Prepare, load and unload reels and cores on and off machine
- ICPSU202B Prepare, load and unload product on and off machine
- ICPSU208B Operate and monitor machines (basic)
- ICPPR351B Set up for basic relief printing
ICPPR261B Set up for foil stamping

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to set up for gold blocking and hot foil stamping.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to set up a die or block and the reel or sheet systems and jigs for gold blocking or hot foil stamping. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Confirm job specifications
   1.1 Job requirements are read and interpreted from job documentation or production control system
   1.2 Set up is carried out correctly in minimum time with minimum wastage
   1.3 Availability of all job related components is checked

2. Set up machine
   2.1 Die or block is selected and checked against job ticket
   2.2 Die or block is locked into chase and checked for correct positioning
   2.3 Chase is mounted in press
   2.4 Foil transfer or feed system is set up and adjusted according to image size and job specifications
   2.5 If required, in-line loading and ejection units are set up for basic processes and adjusted according to machine requirements and job specifications

3. Set up reel system (OR Element 4 OR Element 5)
   3.1 Unwind and rewind reels are is set up and adjusted according to job specifications
   3.2 Webbing procedures are carried out and web-control system is set up and adjusted according to job specifications
   3.3 Reels are spliced / joined according to job specifications
   3.4 Printed web viewing devices are set up and adjusted according to job specifications
   3.5 Folder and sheeter are set up and adjusted suit job specifications
   3.6 Set off / marking prevention devices are set up and adjusted according to job specifications

4. Set up sheet system (OR Element 3 OR Element 5)
   4.1 Feeder and delivery is set up and adjusted according to job specifications
   4.2 Sheet pick-up and transportation system is set up and adjusted according to job specifications
   4.3 Transfer and control systems are set up and adjusted according to job specifications
   4.4 Set off / marking prevention devices are set up and adjusted according to job specifications
   4.5 Substrate is added to and removed from process according to job instructions
5. Set up product jigs onto machine table (OR Element 3 OR Element 4)

5.1 Jigs are selected to suit product to be stamped
5.2 Jigs are fitted to machine table according to job specifications
5.3 Table height is adjusted to suit product

6. Select foils

6.1 Foils are selected according to job specifications and end-user requirements
6.2 Quality and suitability of foils are checked and appropriate action is taken
6.3 Foils are selected according to suitability of substrate, physical and chemical performance and properties
6.4 Foils are prepared according to OHS requirements, and manufacturer’s / supplier’s instructions with suitable precautions to minimise waste
6.5 Foils are appropriately labelled, handled and stored according to manufacturer’s / supplier’s instructions to prevent damage and hazards to personnel and prolong shelf life

7. Conduct proof run

7.1 Material to be used for proof is organised correctly
7.2 Machine is operated according to manufacturer’s and enterprise procedures to produce a specified proof
7.3 Proof is visually inspected and / or tested or laboratory testing organised according to enterprise procedures
7.4 Production does not commence without client OK or authority where appropriate
7.5 Results are interpreted and adjustment changes are carried out according to product and machine specifications to determine adjustment requirements
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting job tickets and requirements
- Collecting, analysing and organising information by collecting and assessing data about foil stamping process and machine specifications and characteristics and how these interact
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when maintaining the production process in association with others
- Mathematical ideas and techniques by calculating die position and requirements for foil and substrate
- Problem-solving skills by recognising proofing faults and determining adjustments to correct them
- Use of technology by using monitoring equipment and interpreting readouts

Required knowledge:
The following knowledge must be assessed as part of this unit:

Interpreting job specifications
- What would you do if vital information were missing from the job ticket?
- What checks should be undertaken prior to set up (availability of materials etc)？

Web or sheet or product transportation (as relevant)
- What are the major OHS concerns when setting up transportation systems?
- How do you determine the printing side of the material?
- What may happen if a previously printed reel is not dry?
- What is the purpose of nip rollers?
- How is the sheet position determined for the job?
- Why is the same side lay used in both print and foil stamping?
- How are the appropriate front lays selected?
- How high should the side and front lays be set?
- Why should a register check be carried out?
- How do you determine appropriate product jigs?
- How do you determine correct table height?

Foils and substrates
- What characteristics must be considered when selecting foil for foil stamped product?
- What type of foil would be required for foiling on plastic films?
- List THREE products and the foils that are appropriate for them.

Machine set up
- What are the OHS concerns related to the set up?
- What would the image be positioned to when setting up?
- What effect would a soft packing have on the foil stamped product?
- What methods can be used to create harder packing?
- What effect does a higher dwell time have on the foil stamped product?
• What temperature would be the starting point when setting up?
• What could happen if the temperature was set too high?
• At what height should the die be mounted?
• How should the required pressure be determined?

Proofing and adjusting
• What precautions should be taken to protect from burns?
• Why wouldn't the first sheet or object printed be used as a proof during set up?
• What is the cause of an uneven print (top to bottom)?
• If the foil was not sticking to the substrate what action could be taken?
• How long do temperature adjustments take to become effective?
• What are the signs of a temperature setting that is too high??
• How much should the foil draw through the press on each pass?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Foils
• Range of foils used in gold blocking and hot foil stamping

Colour matching systems
• Use of visual colour assessment and matching under controlled lighting conditions

Machines
• A range of foil stamping machines, including machines with computerised monitoring and / or control

Design
• Simple graphics and text. Minor variation in registration and position

In-line processes
• Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such
Substrate types

- Range of substrates within the major categories of paper, pressure sensitive material, board, wood, plastics and related films, metal injection moulded plastics, moulded plastics, lacquered substrate

Substrate handling

- Wide or narrow reel or large or small sheet or 3D object handling systems

Degree of autonomy

- Working to defined procedures under limited supervision

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Set up a die or block and the reel or sheet systems and jigs for gold blocking or hot foil stamping. The individual will conduct a proof run and adjust settings to ensure production speeds are attained
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Demonstrate all safety devices on the machine
- Set up for foil stamping on TWO occasions (if possible including at least ONE in-line process if relevant) according to manufacturer's and job specifications, enterprise procedures and the listed Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- gold blocking or hot foil stamping machine
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPSU201B Prepare, load and unload reels and cores on and off machine
- ICPSU202B Prepare, load and unload product on and off machine
- ICPSU207B Prepare machine for operation (basic)
- ICPPR262B Produce foil stamped product
ICPPR262B Produce foil stamped product

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce gold blocking and hot foil stamping product.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to operate a gold blocking or hot foil stamping machine ensuring an efficient production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector
Printing

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Maintain operation of reel system (OR Element 2 OR Element 3) | 1.1 Reel stand and rewind section is monitored and adjusted to maintain correct tension and to ensure no marks, blemishes or damage to finished product and to ensure efficient continuous operation  
1.2 Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web and efficient operation  
1.3 Substrate is added to and removed from process according to job instructions  
1.4 Sheeting section is monitored and adjusted to ensure quality and efficient product delivery  
1.5 Set-off / marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof |
| 2. Maintain operation of sheet system (OR Element 1 OR Element 3) | 2.1 Feeder and delivery is monitored and adjusted to ensure continuous and efficient feeding to machine  
2.2 Sheet pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operation  
2.3 Transfer systems are monitored and adjusted to ensure correct and continuous sheet handling and efficient operation  
2.4 Substrate is added to and removed from process according to job instructions  
2.5 Set-off / marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof |
| 3. Maintain in-line loading and ejection (OR Element 4 OR Element 5) | 3.1 In-line loading is monitored and adjusted to ensure quality and efficient product delivery  
3.2 In-line ejection is monitored and adjusted to ensure quality and efficient product delivery |
### 4. Maintain production process

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Production process is operated in association with fellow workers and according to company specifications and planned daily schedule</td>
</tr>
<tr>
<td>4.2</td>
<td>If necessary, the location of objects into fixtures / jigs is monitored and adjusted</td>
</tr>
<tr>
<td>4.3</td>
<td>Foil transfer system is monitored and adjusted to ensure quality of printed product meets the standard of approved proof</td>
</tr>
<tr>
<td>4.4</td>
<td>Basic in-line printing / converting / binding / finishing process(es) are monitored and adjusted to ensure quality of product meets the standard of the approved proof</td>
</tr>
<tr>
<td>4.5</td>
<td>Production is maintained within OHS requirements and company and manufacturer's specifications</td>
</tr>
<tr>
<td>4.6</td>
<td>Manual and / or automatic control is used as per specification</td>
</tr>
<tr>
<td>4.7</td>
<td>Performance is monitored and verified using the process control system according to enterprise procedures</td>
</tr>
<tr>
<td>4.8</td>
<td>Foil performance and position of print are monitored and adjusted throughout production run</td>
</tr>
<tr>
<td>4.9</td>
<td>Waste is sorted according to enterprise procedures</td>
</tr>
</tbody>
</table>

### 5. Identify and rectify problems

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention</td>
</tr>
<tr>
<td>5.2</td>
<td>Process adjustments to eliminate problems are reported according to enterprise procedures</td>
</tr>
<tr>
<td>5.3</td>
<td>Faulty performance of equipment is identified and reported according to enterprise procedures</td>
</tr>
<tr>
<td>5.4</td>
<td>Problem in foil stamping machine operation is identified and reported according to enterprise procedures</td>
</tr>
<tr>
<td>5.5</td>
<td>Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level</td>
</tr>
<tr>
<td>5.6</td>
<td>Foil stamping machine operation is checked to ensure correct operation</td>
</tr>
</tbody>
</table>

### 6. Conduct shutdown of production process

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures</td>
</tr>
<tr>
<td>6.2</td>
<td>Shutdown is conducted in association with fellow workers and in compliance with OHS requirements</td>
</tr>
<tr>
<td>6.3</td>
<td>Unused foil is correctly labelled and stored according to manufacturer / supplier specifications and enterprise procedures</td>
</tr>
<tr>
<td>6.4</td>
<td>Waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures</td>
</tr>
<tr>
<td>6.5</td>
<td>All product is removed from operating area</td>
</tr>
<tr>
<td>6.6</td>
<td>Machine faults requiring repair are identified and reported to designated person according to enterprise procedures</td>
</tr>
<tr>
<td>6.7</td>
<td>Repair / adjustment is verified prior to resumption of operations</td>
</tr>
</tbody>
</table>
7. Clean printing machine at end of print run

7.1 In-line printing / converting / binding / finishing units are cleaned ready for next run

7.2 Reel feed, transportation and delivery systems are disengaged and cleaned ready for next run OR

7.3 Sheet feed, transport and delivery systems are disengaged and cleaned ready for next run OR

7.4 Jig and conveyors are disengaged and cleaned ready for next run

7.5 Production records or other documentation are accurately completed where required by enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by providing feedback to internal and external clients about printing, in-line processes and job specifications
- Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production
- Mathematical ideas and techniques by calculating consumables and personnel requirements to meet production schedules
- Problem-solving skills by identifying print problems and correcting during print run
- Use of technology by using monitoring systems, understanding their output and feeding into production management systems

Required knowledge:

The following knowledge must be assessed as part of this unit:

Maintaining in-feed and delivery of reel or sheet or 3D object transportation section

- What are the major OHS concerns when operating a transportation system?
- Why are the sheets fanned before loading into the press?
- What effect would the printing of double sheets have on the foil stamped product?
- Why is the tracking of the web important to position and register?
- What will happen if the web is not spliced correctly?
- What identification should be used for web splices?
- What precautions should be taken to ensure that the rewound product is of consistent acceptable quality?
- If sheeted, what components can be adjusted to ensure correct delivery?
- How is printed material that is not of an acceptable standard identified?
- What aspects of loading and ejection need to be monitored?

Maintaining the foil stamping process

- What are the major OHS concerns when foil stamping?
- What considerations will contribute to determining the ideal press speed?
- At what interval should the product be checked for consistency?
- What could be the cause of the non-image areas of the print filling in?
- What remedial action could be taken if the edges of the print were jagged?
- Why is the use of anti set off spray not recommended when foil stamping?
- How do you adjust the machine to correct a shift in the image position on the object?

Shutdown and cleaning of the press

- What dangers exist from solvents and solutions used to clean the press and printing dies?
- How should dies be stored following printing?
- What is the effect of poorly stored dies?
What parts of the machine should be thoroughly cleaned following the print run?
What components are to be inspected for wear following the print run?
What records are important for following or repeat prints?

Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Foils

- Range of foils used in gold blocking and hot foil stamping

Colour matching systems

- Use of visual colour assessment and matching under controlled lighting conditions

Machines

- A range of foil stamping machines, including machines with computerised monitoring and/or control

Design

- Simple graphics and text. Minor variation in registration and position

In-line processes

- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g., flat-bed cutting, folding) it should be assessed as such

Substrate types

- Range of substrates within the major categories of paper, pressure sensitive material, board, wood, plastics and related films, metal injection moulded plastics, moulded plastics, lacquered substrates

Substrate handling

- Wide or narrow reel or large or small sheet or 3D object handling systems

Degree of autonomy

- Working to defined procedures under limited supervision
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Operate a gold blocking or hot foil stamping machine ensuring an efficient production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Produce TWO foil stamped products (if possible including at least ONE in-line process if relevant) according to job specifications, enterprise procedures and the Performance Criteria

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- a gold blocking or hot foil stamping machine

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPSU201B Prepare, load and unload reels and cores on and off machine
- ICPSU202B Prepare, load and unload product on and off machine
- ICPSU208B Operate and monitor machines (basic)
- ICPPR261B Set up for foil stamping
ICPPR271B

Set up for basic coating

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to set up for routine spot or overall coating.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to set up rollers and the reel or sheet systems for coating a range of aqueous coatings, UV varnishes and machine varnishes. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.

Unit Sector
Printing

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Confirm job specifications</td>
<td>1.1 Job requirements are read and interpreted from job documentation or production control system</td>
</tr>
<tr>
<td></td>
<td>1.2 Set up is carried out correctly in minimum time with minimum wastage</td>
</tr>
<tr>
<td></td>
<td>1.3 Availability of all job related components is checked</td>
</tr>
<tr>
<td>2. Set up reel system (OR Element 3)</td>
<td>2.1 Unwind and rewind reels are is set up and adjusted according to job specifications</td>
</tr>
<tr>
<td></td>
<td>2.2 Webbing procedures are carried out and web-control system is set up and adjusted according to job specifications</td>
</tr>
<tr>
<td></td>
<td>2.3 Reels are spliced / joined according to job specifications</td>
</tr>
<tr>
<td></td>
<td>2.4 Printed web viewing devices are set up and adjusted according to job specifications</td>
</tr>
<tr>
<td></td>
<td>2.5 Set off / marking prevention devices are set up and adjusted according to job specifications</td>
</tr>
<tr>
<td>3. Set up sheet system (OR Element 2)</td>
<td>3.1 Feeder and delivery is set up and adjusted according to job specifications</td>
</tr>
<tr>
<td></td>
<td>3.2 Sheet pick-up and transportation system is set up and adjusted according to job specifications</td>
</tr>
<tr>
<td></td>
<td>3.3 Transfer and control systems are set up and adjusted according to job specifications</td>
</tr>
<tr>
<td></td>
<td>3.4 Substrate is removed from process according to job instructions</td>
</tr>
<tr>
<td></td>
<td>3.5 Set off / marking prevention devices are set up and adjusted according to job specifications</td>
</tr>
</tbody>
</table>
4. Select and prepare coating

4.1 Coating is selected according to job specifications and end-user requirements

4.2 Quality and suitability of coating is checked and appropriate action is taken

4.3 Coatings and additives are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste

4.4 Correct weight / volume of coating is prepared to match the requirements of the job specification and the coating process

4.5 Check the viscosity of coating is correct for the job

4.6 Formulation of the coating is appropriately recorded

5. Set up machine for coating

5.1 Appropriate rollers / cylinders are selected and secured to the machine and set

5.2 Application system is set up and adjusted according to job specifications

5.3 Coating delivery system is set up with correct flow and return flow determined by air pressure or pump speeds and adjusted according to job specifications

5.4 Cut a coating blanket or install a plate for non-image areas

5.5 Check that blanket or plate packing is suitable to the job

5.6 Check that the coating temperature is suitable for the job

5.7 Drying system is set up and adjusted according to job specifications

6. Conduct proof run

6.1 Material to be used for proof is organised correctly

6.2 Machine is set up and operated to produce a specified proof according to OHS requirements, manufacturer's specifications and enterprise procedures

6.3 Proof is visually inspected and / or tested or laboratory testing organised according to enterprise procedures

6.4 Production does not commence without client OK or authority where appropriate

6.5 Results are interpreted and adjustment changes are carried out according to product and machine specifications

6.6 Adjustment changes are carried out according to product and machine specifications
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting job tickets and requirements
- Collecting, analysing and organising information by collecting and assessing data about coating process and machine specifications and characteristics and how these interact
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when maintaining the production process in association with others
- Mathematical ideas and techniques by calculating plate position and coating viscosity
- Problem-solving skills by recognising proofing faults and determining adjustments to correct them
- Use of technology by using monitoring equipment and interpreting readouts

Required knowledge:
The following knowledge must be assessed as part of this unit:

Interpreting job specifications

- Where on the work ticket is the information listing the type of coating required?
- What would you do if vital information were missing from the job ticket?
- What checks should be undertaken prior to set up (availability of materials etc)?

Sheet or reel transportation

- What are the major OHS concerns when setting up the sheet or reel transportation system?
- How is the coating side of the material chosen?
- What would be the effect of low web tension on the print?
- What is the effect of inefficient web splices?
- How was the sheet or reel position determined for the job?
- What effect does side lay selection have on the job?
- How would the appropriate front lays be selected?
- How would a register check be carried out?
- Why is a two-sheet cut out used on most feeders (sheet)?
- How does the machine know if a sheet is missing or late?
- How does the machine know if there has been a web break?

Sheet or reel delivery

- List THREE safety risks associated with the rewind of the machine.
- What would be the effect of excessive web tension at the rewind of the machine?
- What effect will too much vacuum on the slow-down wheels have on the job?
- What determines the position of register or bustle wheels?
- What effect would excessive jogging have on the stack?

Coating preparation

- What OHS concerns are relevant to the use of coatings?
- List THREE types of coatings.
- How is the suitability of the coating determined for the job?
• How is the ability of the coat to adhere to the product determined?
• How do you determine the amount of coating required?
• What range of viscosities should you run with on an aqueous coating?
• What is the effect of incorrect viscosity?
• How do you adjust the viscosity of a coating?

**Machine set up**

• What methods does the coating use to solidify?
• What is required to dry UV coating?
• What printing principle is being utilised to apply aqueous coating?
• Why is it important that gluing tabs are not coated?
• What temperature is the drier set at to dry aqueous coating?
• How do you determine which image carrier (plate or blanket) to use?

**Proofing and adjustments**

• How is the position of the coating checked against the print?
• What effect could skeleton wheels have on the surface of the coating?
• How can the amount of gloss on the surface be measured?
• Who is responsible for the final "OK" on the job?
• What effect do you get when you don’t have enough coating on a sheet?
• What effect would a UV coating have on a wet print?

**Information sources**

• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?

**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

**Coatings**

• A range of aqueous coatings, UV varnishes and machine varnishes

**Colour matching systems**

• Use of visual colour assessment and densitometry to match basic standard tints under controlled lighting conditions

**Machines**

• A range of printing machines or dedicated coating machines with manual, semi-automated, fully automated or computerised process control
In-line processes

- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g., flat-bed cutting, folding) it should be assessed as such.

Substrate types

- Paper and paperboard and other substrates as appropriate

Substrate handling

- Narrow or wide reel handling, and small and large sheet systems

Degree of autonomy

- Working to defined procedures under limited supervision

Routine

- Routine within this context relates to the set up and production of print runs. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Set up rollers and the reel or sheet systems for coating a range of aqueous coatings, UV varnishes and machine varnishes. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
- Demonstrate all safety devices on the machine.
- Set up for two basic coating operations (one spot coating and one overall coating and if possible including at least one in-line process) according to manufacturer's and job specifications, enterprise procedures and the Performance Criteria.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
• printing machines or dedicated coating machines

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

• direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

• ICPSU201B Prepare, load and unload reels and cores on and off machine
• ICPSU202B Prepare, load and unload product on and off machine
• ICPSU207B Prepare machine for operation (basic)
• ICPSU211B Prepare ink and additives
• ICPPR272B Produce basic coated product
ICPPR272B Produce basic coated product

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce basic spot or overall coated product.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to produce a basic coated product on either a reel- or sheet-fed machine ensuring an efficient production flow that maintains product quality standards. Any production problems are identified and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Maintain operation of reel system (OR Element 2)
   1.1 Reel stand and rewind section is monitored and adjusted to maintain correct tension and to ensure no marks or blemishes to finished product and to ensure efficient continuous operation
   1.2 Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation
   1.3 Substrate is added to and removed from process according to job instructions
   1.4 Sheet section is monitored and adjusted to ensure quality and efficient product delivery

2. Maintain operation of sheet system (OR Element 1)
   2.1 Feeder and delivery is monitored and adjusted to ensure continuous and efficient feeding to machine
   2.2 Sheet pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operation
   2.3 Transfer systems are monitored and adjusted to ensure correct and continuous sheet handling and efficient operation
   2.4 Substrate is added to and removed from process according to job instructions

3. Maintain coating process
   3.1 Roller condition is monitored and adjusted to ensure the quality of printed product meets the standard of approved proof
   3.2 Coating system is monitored and adjusted to ensure quality of product meets the standard of approved proof
   3.3 Drying systems are monitored and adjusted to ensure quality of product meets the standard of approved proof
   3.4 Quality and viscosity of varnish are monitored and adjusted as necessary to ensure quality of product
4. Maintain production process

4.1 If required, basic or complex in-line printing / converting / binding / finishing processes are monitored and adjusted to ensure quality of product meets the standard of the approved proof

4.2 If required, delivery is monitored and adjusted to ensure quality and efficient product delivery

4.3 Production process is operated in association with fellow workers and according to company specifications and planned daily schedule

4.4 Production is maintained within OHS requirements and company and manufacturer's specifications

4.5 Manual and / or automatic control is used as per specification

4.6 Performance is monitored and verified using the process control system according to enterprise procedures

4.7 Coating performance, register and position of coating are monitored and adjusted throughout production run

4.8 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention

4.9 Process adjustments to eliminate problems are reported according to enterprise procedures

4.10 Waste is sorted according to enterprise procedures

5. Identify and rectify problems

5.1 Faulty performance of equipment is identified and reported according to enterprise procedures

5.2 Problems in coating machine are identified and reported according to enterprise procedures

5.3 Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level

5.4 Coating machine operation is checked to ensure correct operation

6. Conduct shutdown of production process

6.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures

6.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

6.3 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

6.4 All product is removed from operating area

6.5 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures

6.6 Repair / adjustment is verified prior to resumption of operations
7. Clean and wash up coating machine at end of print run

7.1 Cylinders, plate and roller surfaces are cleaned ready for next run
7.2 Coating delivery system is washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements
7.3 In-line slitting units are cleaned ready for next run
7.4 Reef feed, transportation and delivery systems are disengaged and cleaned ready for next run
7.5 Production records or other documentation are accurately completed where required by enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by providing feedback to internal and external clients about printing, in-line processes and job specifications
- Collecting, analysing and organising information by collating details of job and machine specifications and coating processes to ensure efficient production
- Planning and organising activities by coordinating sequences for coating and wash-up
- Teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production
- Mathematical ideas and techniques by calculating consumables requirements
- Problem-solving skills by identifying coating problems and correcting during print run
- Use of technology by using monitoring systems, understanding their output and feeding into production management systems

Required knowledge:
The following knowledge must be assessed as part of this unit:

Interpreting job information
- What would you do if vital information was missing from the job ticket?
- What checks should be undertaken prior to set up (availability of materials etc.)?

Reel or sheet transportation and delivery
- What OHS concerns are there related to loading and handling heavy reels?
- Why are the sheets fanned before loading into the press?
- Why is it important that the double sheet detector be set and checked during the print run?
- What would be the effect on the print of excessive tension on the rewinding reel?
- What will happen if the web is not spliced correctly?
- What precautions should be taken to ensure that the rewound product is of consistent acceptable quality?
- If sheeted, what components can be adjusted to ensure correct delivery?
- How is printed material that is not of an acceptable standard identified?

Maintaining coating operations
- What are the major OHS concerns when coating?
- What action could be taken if the aqueous coating was smudging on the delivery section of the machine?
- What effects could anti set off spray have on the finished job?
- At what level should the coating be maintained in the pan?
- What effect does the UV lamp have on the UV coating?

Wash-up and shutdown of machine
- What dangers exist from solvents and solutions used to clean the coating system, plates, cylinders and the press?
- What parts of the machine should be thoroughly cleaned following the coating of the job?
What components are to be inspected for wear following the print run?
What records are important for following or repeat prints?

Information sources
- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Coatings
- A range of aqueous coatings, UV varnishes and machine varnishes

Colour matching systems
- Use of visual colour assessment and densitometry to match basic standard tints under controlled lighting conditions

Machines
- A range of printing machines or dedicated coating machines with manual, semi-automated, fully automated or computerised process control

In-line processes
- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such

Substrate types
- Paper and paper board and other substrates as appropriate

Substrate handling
- Narrow or wide reel handling, and small and large sheet systems

Degree of autonomy
- Working to defined procedures under limited supervision
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Produce a basic coated product on either a reel- or sheet-fed machine ensuring an efficient production flow that maintains product quality standards. Any production problems are identified and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Competency on elements and performance criteria is achieved within the limitations of the process or machinery used
- Produce TWO basic coating jobs (one spot coating and one overall coating and if possible including at least ONE in-line process) according to job specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- a print machine or a dedicated coating machine

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPSU201B Prepare, load and unload reels and cores on and off machine
- ICPSU202B Prepare, load and unload product on and off machine
- ICPSU208B Operate and monitor machines (basic)
- ICPPR271B Set up for basic coating
ICP05 Printing and Graphic Arts Training Package (Version 2)  Date this PDF was generated: 05 October 2010
ICPRR281B Set up and produce basic digital print

ICP281B Set up and produce basic digital print

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to set up and produce digital print in a basic print production environment.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to set up either reel- or sheet-fed digital printing systems to manufacturer's specifications. The individual will perform routine maintenance tasks to ensure production speeds are attained, print quality is achieved and servicing requirements are minimised.

The competency is best applied in the instant printing and copy shop business environment.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Check components and functions of a digital print system
   1.1 All areas of user replaceable consumables are checked and replacements made
   1.2 Substrate feeding mechanisms and transport units are checked and cleared of any misfeeds
   1.3 Correct set up for data and electrical power is completed
   1.4 Shutdown and restart procedures are performed according to manufacturer's specifications
   1.5 Print driver and / or job download software are correctly installed and set up on workstation computer and / or digital front-end processor

2. Maintain digital printing system to maximise productivity and quality
   2.1 Routine maintenance tasks are performed according to manufacturer's specifications
   2.2 Substrate transport and inking systems are cleaned to ensure optimum productivity and quality
   2.3 Temperature and humidity conditions are checked to ensure even flow of substrate
   2.4 Substrate registration mechanisms are checked to ensure alignment of printed images
   2.5 Ink density calibration is performed on a digital print system to meet job specifications
   2.6 Basic maintenance solutions to minimise ink residue, substrate misfeed, paper particle dust, uncalibrated systems and ink coverage are implemented

3. Maintain and perform optimum substrate handling procedures
   3.1 A paper handling and storage system for a digital print environment is developed that maintains substrate integrity and digital image quality
   3.2 Machine status is checked, print counters and consumable levels are reviewed and time estimated for reordering, servicing and reporting purposes
4. Confirm job specifications
   4.1 Print job specifications are read and interpreted from job documentation or production control system
   4.2 Availability of all job components is checked according to enterprise procedures
   4.3 Finishing requirements of job are checked and internal workflow and / or outsource arrangements are coordinated according to enterprise procedures
   4.4 Run time of job is calculated and completion time is estimated, allowing consideration for other production demands

5. Set up reel system (or Element 6)
   5.1 Unwind reel is adjusted according to job specifications
   5.2 Rewind reel is set up and adjusted according to job specifications
   5.3 Minor in-line processes are set up and adjusted according to job specifications

6. Set up sheet transportation system on sheet-fed machine (or Element 5)
   6.1 Substrate is loaded into correct feeding mechanism and all substrate properties are correctly specified in the user control interface
   6.2 Adjustments to the delivery unit are identified and made using the user control interface according to job specifications
   6.3 The on-line finishing unit is adjusted using the user control interface according to job specifications

7. Access and verify electronic data files
   7.1 The on-line finishing unit is adjusted using the user control interface according to job specifications
   7.2 A digital front end processor is used to locate and retrieve electronic data files according to job specifications
   7.3 Preview or pre-flight check of electronic data files is performed to verify correct job set up according to job specifications
   7.4 Basic troubleshooting methods are applied to identify and rectify unverified data files, file errors and job requirement inconsistencies as per manufacturer's specifications

8. Submit data files to a digital print system
   8.1 Job priority is determined according to job specifications and production schedules
   8.2 Data file is submitted to print and image quality and machine productivity checks are performed

9. Produce digital proof and run digital print job
   9.1 A proof run is conducted to confirm proof conforms to job specifications and / or for client approval, if required
   9.2 Entire print run is conducted according to job specifications ensuring that machine productivity and quality are monitored and rectified throughout the duration of the print job

10. Coordinate and / or perform document finishing and client delivery
    10.1 Steps required for document finishing are identified if not performed on in-line finishing units on a web or sheet-fed system according to job specifications
    10.2 Finished print work is packaged in a manner to prevent damage and to conform to delivery requirements according to job specifications
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting job tickets and requirements
- Collecting, analysing and organising information by collecting and assessing data about coating process and machine specifications and characteristics and how these interact
- Planning and organising activities by providing information about time and materials requirements for set up, production and finishing to ensure efficient operation
- Teamwork when recognising proofing faults and determining adjustments to correct them
- Mathematical ideas and techniques by calculating substrate properties and production speeds to determine run length
- Problem-solving skills by recognising proofing faults and determining adjustments to correct them
- Use of technology by using computerised technology to access data files and adjusting them

Required knowledge:

The following knowledge must be assessed as part of this unit:

Job requirements and electronic data processing

- What would you do if vital information was missing from the job ticket (manual or electronic)?
- What checks should be undertaken prior to set up (availability of material, maintenance)?
- If a file does not transfer correctly what action should be taken to correct the problem?
- What are the main points to be checked before submitting a file to print?

Inking or imaging system

- What OHS procedures should be followed when loading ink / toner?
- What determined the selection of the specific ink / toner for the printed product?
- What checks were performed ensure quality of ink / toner?

Sheet or web transportation and delivery

- What would you do if the required substrate was unavailable?
- What is the maximum weight of substrate that can be printed on a specific machine?
- What is the minimum weight of substrate that can be printed on a specific machine?
- What are the possible faults associated with printing on lightweight paper?
- What pre-prepared substrates are available for a specific machine?
- What is the maximum delivery quantity for the machine?
- What are the possible problems with incorrect feeding and delivery?

Data access and manipulation

- What checks are made to ensure the data is in a format that can be used in digital print?
- What are the benefits of using electronic data rather than scanning hard copy?
- What are the ways to submit a PDF file to the digital printer?
In-line and on-line processes

- What OHS procedures should be followed when setting up in-line processes?
- What in-line options are available on the machine?
- What on-line finishing options are available on the machine?
- How do you set up the in-line / on-line processes?

Proofing and adjustment

- Under what circumstances would a job be modified before printing?
- Why would margins be changed when the job reaches the printer?
- What steps would need to be followed for a client approval of the print?
- What is the proof checked against?
- Who gives the final approval for basic jobs?
- How could you adjust colour, toner / ink coverage or density problems?

Document finishing and client delivery

- What are the various types of binding?
- What procedures would you follow if the binding method required by the client was not available at your site?
- What options could you suggest if the document size was too thick to staple?
- Why is packaging finished print work important?

Information Sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?
- What other sources of information can you identify?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inking systems

- Range of toners commonly used in colour printing, including special colours

Colour matching systems

- Use of visual colour assessment and matching under controlled lighting conditions

Machines

- Range of non-impact printing machines including inkjet and laser with or without colour manipulation capability, and including machines with computerised monitoring and / or control

Design

- Simple graphics and text. Minor variation in registration position
In-line processes

- Minor in-line processes such as perforating, numbering, date coding and imposition that do not constitute another defined unit of competency. Major in-line process is defined as a separate competency eg flat-bed cutting or folding

Substrates

- Range of print media and paper

Degree of autonomy

- Working to defined procedures under limited supervision

Manufacturer's specifications

- Technical, administrator and user specifications documented by a manufacturer for a range of printing machines

User replaceable consumables

- Consumables required to be changed by an individual if damaged or reached expiry. Used by a range of printing machines for correct functioning such as ink, toner, developer, waste toner, cleaning web, fuser, substrates

User control interface

- Computerised monitoring and data entry device used to enter machine default settings, job specification settings, monitor machine status and perform machine productivity enhancements

Calibration

- Mechanical and / or electronic and / or visual controls used to identify and correct ink coverage and density inconsistencies in a range of printing equipment

Enterprise procedures

- May include rules, standards, OHS guidelines, communication protocols and behaviour codes of a range of workplace environments
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Set up a reel- or sheet-fed digital printer. Access data and conduct a digital proof run. Adjust settings and ensure production speeds are attained
- Demonstrate use of computerised control and monitoring systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Demonstrate all safety devices on machine
- Perform preventive maintenance as per manufacturer's specifications
- Set up and produce four digitally printed jobs:
  - Single-sided, multi-page, stapled, black and white
  - Double-sided, multi-page, hole punched, b / w
  - Single-sided, multi-page, stapled, 2-colour
  - Double-sided, multi-page, hole punched, 2-colour
- For valid and reliable assessment of this unit, evidence should be gathered over a period of time through a range of methods for assessment to indicate consistent performance.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- a digital printing machine
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPSU201B Prepare, load and unload reels and cores on and off machine
- ICPSU202B Prepare, load and unload product on and off machine
- ICPSU207B Prepare machine for operation (basic)
- ICPPR282B Produce and manage basic digital print
ICPPR282B Produce and manage basic digital print

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce and manage digital print for a basic print production environment.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to produce and manage digital printing systems to achieve maximum productivity. The individual will perform troubleshooting and conduct maintenance, manage digital print client service operations, construct a range of electronic data files, perform basic colour management techniques, design electronic workflow systems, produce and manage a print run and coordinate finishing and delivery.

The competency is best applied in the instant printing and copy shop business environment.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Troubleshoot and maintain operations of a digital print system
   1.1 Errors in operation of the hardware and consumable components in the printing module of a digital printing system are identified and rectified
   1.2 The source of errors related to the electronic data file, digital front end, workstation or industry software or hardware printing systems is located and rectified and / or technical assistance is coordinated according to manufacturer's specifications
   1.3 Preventive maintenance is performed according to manufacturer's specifications to ensure digital print system functions at optimum productivity with minimum downtime and wastage
   1.4 Incompatibilities between versions of hardware and software used in digital printing are identified and rectified

2. Liaise with clients
   2.1 Print service and quality expectations are clearly communicated to a client according to enterprise procedures
   2.2 Advice is provided to clients on how to set up electronic data files for digital printing according to enterprise procedures, manufacturer's specifications and digital print equipment capabilities
   2.3 Advice is provided to clients on appropriate substrates and document finishing methods for digital printing jobs, according to the client's budget and job specifications

3. Perform basic electronic document impositions
   3.1 Electronic file imposition using a range of industry software is completed according to job specifications
   3.2 Document finishing requirements for an imposed digital print job are finalised with co-workers or external services, if required, according to equipment availability and enterprise procedures
<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
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<tbody>
<tr>
<td>4.</td>
<td>Perform basic digital colour management</td>
</tr>
<tr>
<td>4.1</td>
<td>RGB, CMYK and PMS colour charts are outputted and differences between computer monitor colour and digitally printed colour are adjusted</td>
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<tr>
<td>4.2</td>
<td>Common problems of colour digital printing are rectified and communicated to clients according to job specifications</td>
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<td>5.</td>
<td>Access and verify electronic data files</td>
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<tr>
<td>5.1</td>
<td>A workstation computer and industry software are used to locate and retrieve electronic data files according to job specifications</td>
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<tr>
<td>5.2</td>
<td>A digital front end processor is used to locate and retrieve electronic data files according to job specifications</td>
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<tr>
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<td>Preview or pre-flight check of electronic data files is performed to verify correct job set up according to job specifications</td>
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<tr>
<td>6.</td>
<td>Submit data files to a digital print system</td>
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<tr>
<td>6.1</td>
<td>Job priority is determined according to job specifications and production schedules</td>
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<tr>
<td>6.2</td>
<td>Data files are submitted to print and image quality and machine productivity checks are performed</td>
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<td>7.</td>
<td>Produce digital proof and run print job</td>
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<tr>
<td>7.1</td>
<td>A proof run is conducted to confirm proof conforms to job specifications and / or for client approval, if required</td>
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<tr>
<td>7.2</td>
<td>A print run is conducted according to job specifications ensuring that machine productivity and quality are monitored and rectified throughout the duration of the print job</td>
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<tr>
<td>8.</td>
<td>Coordinate and / or perform document finishing and client delivery</td>
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<tr>
<td>8.1</td>
<td>The steps required for document finishing if not performed on in-line finishing units are determined on a web or sheet-fed system according to enterprise procedures</td>
</tr>
<tr>
<td>8.2</td>
<td>Finished print work is packaged in a manner to prevent damage and to conform to delivery requirements according to job specifications</td>
</tr>
</tbody>
</table>
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by interpreting the job brief and providing advice to internal and external clients about options and limitations
• Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
• Planning and organising activities by providing information about time and materials requirements for production scheduling
• Teamwork when cooperating with other workers and coordinating the production unit to ensure efficient operation
• Mathematical ideas and techniques by calculating electronic file memory requirements for print job management and scheduling
• Problem-solving skills by defining whether printing or data processing faults minimise machine downtime and wastage
• Use of technology by using software to construct electronic files for digital printing

Required knowledge:
The following knowledge must be assessed as part of this unit:

Troubleshooting and problem solving
• What safety devices are in place when working on the machine?
• If there is a paper misfeed, how do you know where to access and clear it?
• What could you do if there was a problem with front to back registration?
• What problems can occur if substrate weight and machine specifications do not match?
• What problems can occur downloading files from a digital front end and how can they be solved?
• How can you distinguish between a problem with downloading from a digital front end and a problem with the printing module?
• What can you do if a digital front end loses communication with the printing module?

Quality control
• What precautions can be taken to maintain fit, proportion and position of printed images?
• How do you ensure that the machine has been calibrated to manufacturer's specifications?
• What do you do if image colour is not consistent?
• How do you ensure that correct dimensions and measurements have been set up in the pre-press stage?
• What quality issues can arise if improper substrate handling procedures are not performed?

Information sources
• What machine manuals, safety and other documentation are relevant to machine operation and maintenance and where are they kept?
• Where can you find information relating to industry software applications?
• If you have the incorrect version of software or need an update, how would you locate and
acquire this?
  • What other sources of information can you identify?

Job requirements and processing systems
  • What would you do if vital information was missing from the job ticket (manual or electronic)?
  • What checks were undertaken prior to set up (availability of material, maintenance)?
  • If a file does not transfer correctly what action should be taken to correct the problem?

Data access and manipulation
  • What checks are made to ensure the data is in a format that can be used in digital printing?
  • What are the benefits of using electronic data rather than scanning hard copy?
  • What are the ways to submit a PDF file to the digital printer?

Communication and client interaction
  • What measures can be taken to ensure clients have correct procedures for providing electronic files?
  • How would you explain to a client about differences in colour displayed on a computer monitor to printed output?
  • What recommendations could you make to a client who has created an electronic file in an incompatible software application?
  • How would you estimate a turnaround time for a client with a tight deadline?
  • What steps would need to be followed for a client approval of the print?

Proofing and adjustment
  • Under what circumstances would a job be modified before printing?
  • Why would margins be changed when the job reaches the printer?
  • What is the proof checked against?
  • Who gives the final approval for basic jobs?
  • How could you adjust colour, toner / ink coverage or density problems?

Substrate transportation, delivery, in-line and on-line processes
  • What would you do if the required substrate were unavailable?
  • What is the maximum and minimum weight of substrate that can be printed on a specific machine?
  • What are the maximum feeding and delivery quantities for the machine?
  • What are the possible problems with incorrect feeding and delivery?
  • What OHS procedures should be followed when setting up in-line processes?
  • What in-line options are available on the machine?
  • What on-line finishing options are available on the machine?

Document finishing and client delivery
  • What are the various types of binding?
  • What procedures would you follow if the binding method required by the client was not available at your site?
  • What options could you suggest if the document size was too thick to staple?
  • Why is packaging finished print work important?
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

**Inking systems**  
- Range of toners commonly used in 2-colour printing, including special colours

**Colour matching systems**  
- Use of visual colour assessment and matching under controlled lighting conditions

**Machines**  
- Range of non-impact printing machines including inkjet and laser with or without colour manipulation capability, and including machines with computerised monitoring and/or control

**Design**  
- Simple graphics and text. Minor variation in registration position

**In-line processes**  
- Minor in-line processes such as perforating, numbering, date coding and imposition that do not constitute another defined unit of competency. Major in-line process is defined as a separate competency eg flat-bed cutting, folding

**Substrates**  
- Range of print media and paper

**Degree of autonomy**  
- Working to defined procedures under limited supervision

**Manufacturer's specifications**  
- Technical, administrator and user specifications documented by a manufacturer for a range of printing machines

**User replaceable consumables**  
- Consumables required to be changed by an individual if damaged or reached expiry. Used by a range of printing machines for correct functioning such as ink, toner, developer, waste toner, cleaning web, fuser, substrates

**User control interface**  
- Computerised monitoring and data entry device used to enter machine default settings, job specification settings, monitor machine status and perform machine productivity enhancements
Registration mechanisms

- Mechanical and/or electronic controls used to adjust substrate position throughout substrate feeding and transport units of a range of printing machines

Calibration

- Mechanical and/or electronic and/or visual controls used to identify and correct ink coverage and density inconsistencies in a range of printing equipment

Enterprise procedures

- May include rules, standards, OHS guidelines, communication protocols and behaviour codes of a range of workplace environments

Electronic data files

- Range of proprietary or non-proprietary data file formats compatible with a range of workstation computers and industry software
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Demonstrate use of computerised control and monitoring systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Produce a flowchart that demonstrates FOUR examples of digital print workflows for digital printing (one basic document file, one variable data document file, one colour document file and one electronically imposed document file)
- Create and print a document that provides information to clients on digital print services available and outlines correct methods for submitting electronic files to the services available
- Electronically construct, digitally print and coordinate finishing for the following set of business stationery that has text and graphic elements:
  - Four-colour A4 Letterhead, which includes static text and graphic elements and variable data name and address elements. Minimum variable components - 10.
  - 100 four-colour business cards with crop marks. Maximum number of business cards to the maximum sheet size of the printer eg 20 cards on SRA3.
  - Four-colour 16-page A4 business proposal document, perfect bound with own choice of binding.
  - Four-colour 4-page advertising brochure using saddle stitch binding method printed on A4 or A3 substrate size
- For valid and reliable assessment of this unit, evidence should be gathered over a period of time through a range of methods for assessment to indicate consistent performance
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity
Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
• a digital printing machine and digital front end

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

• direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

• ICPSU201B Prepare, load and unload reels and cores on and off machine
• ICPSU202B Prepare, load and unload product on and off machine
• ICPSU208B Operate and monitor machines (basic)
• ICPPR281B Set up and produce basic digital print
• ICPPR383B Prepare for personalised digital printing
ICPPR313B

Unit Descriptor

Set up for basic flexographic printing
This unit describes the performance outcomes, skills and knowledge required to set up machines for routine flexographic printing.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to set up flexographic printing machines. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.

Mounting and proofing plates is covered in ICPPR211B Mount and proof flexographic plates for basic printing.

Unit Sector
Printing

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Confirm routine job specifications</td>
<td>1.1 Job requirements are read and interpreted from job documentation or production control system</td>
</tr>
<tr>
<td></td>
<td>1.2 Set up is carried out correctly in minimum time with minimum wastage</td>
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<tr>
<td></td>
<td>1.3 Availability of all job related components is checked</td>
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<tr>
<td></td>
<td>1.4 Proofed job is checked for conformance with job specifications</td>
</tr>
<tr>
<td>2. Set up routine reel system (OR Element 3)</td>
<td>2.1 Reels are checked for treatment levels, coatings, printing side and age of product</td>
</tr>
<tr>
<td></td>
<td>2.2 Unwind reels are secured on reel shaft according to job specifications</td>
</tr>
<tr>
<td></td>
<td>2.3 Reels are correctly positioned on unwind stand according to job specifications</td>
</tr>
<tr>
<td></td>
<td>2.4 Correctly cut cores are positioned and mounted securely on rewind shafts</td>
</tr>
<tr>
<td></td>
<td>2.5 Press is webbed for single-sided surface print according to job specifications</td>
</tr>
<tr>
<td></td>
<td>2.6 Edge guide is centred and set according to job specifications</td>
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<tr>
<td></td>
<td>2.7 Unwind tension is set to suit substrate according to job specifications</td>
</tr>
<tr>
<td></td>
<td>2.8 Rewind tension is set to suit substrate according to job specifications</td>
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<tr>
<td></td>
<td>2.9 Nip rollers are set according to job specifications</td>
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<tr>
<td></td>
<td>2.10 PIV (Positively Infinitely Variable) drive is set for appropriate tensioning of substrate</td>
</tr>
</tbody>
</table>
3. Set up routine sheet system (OR Element 2)

3.1 Feeder is set up and adjusted according to job specifications

3.2 Sheet pick-up and transportation system is set up and adjusted according to job specifications

3.3 Transfer systems are set up and adjusted according to job specifications

3.4 Delivery is set up and adjusted according to job specifications

3.5 Substrate is removed from stacker according to job specifications

3.6 Sheet transfer and control system is set up and adjusted according to job specifications

3.7 Set off / marking prevention devices are set up and adjusted according to job specifications

4. Select and prepare inks and solvents

4.1 Inks and solvents are selected according to routine job specifications and end-user requirements

4.2 Quality and suitability of inks and solvents are checked and appropriate action is taken

4.3 Inks and solvents are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste

4.4 Correct colour and weight / volume of ink are mixed and viscosities checked and modified according to press requirements and routine job specifications

4.5 Ink formula and approved colour draw downs appropriately recorded

4.6 Inks and solvents are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions and the relevant hazardous liquids storage regulations

5. Set up machine for basic flexographic printing

5.1 Flexographic plate cylinders are installed and register adjustments centred OR

5.2 Sleeves are installed in press and register adjustments made OR

5.3 Plate mounting sheets are mounted on cylinders in press and register adjustments made

5.4 Plate cylinders are gauged up or pre-set to impression

5.5 Inking system is set up and roller nips / blades are set correctly

5.6 Ink circulation is maintained at correct level and flow for machine requirements

5.7 Viscosities are adjusted according to job specifications

5.8 Air volume and drier temperatures or curing systems are selected to suit inks, substrate, solvents and according to job specifications

5.9 Air volume is adjusted between colours to maximise drying and minimise air overspill
6. Set up in-line units for basic process(es)
   6.1 Minor in-line printing / converting / binding units are set up for basic process(es) and adjusted to suit machine requirements and job specifications
   6.2 Assistance is given in the set up of major in-line printing / converting / binding units. (Note: if entire set up is done refer to appropriate Set up competency standards.)

7. Conduct proof run
   7.1 Material to be used for proof is organised correctly
   7.2 Press is set up and operated according to OHS guidelines
   7.3 Print impressions are set to minimum kiss impression
   7.4 Web tensions are correctly set at unwind, between stations and rewind
   7.5 The print is checked for register
   7.6 Drying is checked as sufficient to key ink to the substrate
   7.7 The viscosities are adjusted to obtain the correct colour at proof speed and checked against colour matching system
   7.8 The substrate is checked against job specifications

8. Organise proof inspection and / or testing
   8.1 Proof is visually inspected and / or tested or laboratory testing is organised according to enterprise procedures
   8.2 Production does not commence without client approval or authority where appropriate

9. Readjust settings to production speed
   9.1 Production speed print results are interpreted and appropriate adjustments are made to press, ink and substrate settings
   9.2 Adjustments are made according to product specifications and press performance
   9.3 Web is spliced at production speed and further samples are obtained for quality inspections at appropriate intervals
   9.4 Press setting is documented and samples are retained
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by interpreting job tickets and requirements
• Collecting, analysing and organising information by collecting and assessing data about printing process and machine specifications and characteristics and how these interact
• Planning and organising activities by providing input into production scheduling about time requirements for set up to ensure efficient operation
• Teamwork when working with other workers to coordinate set up to ensure efficient operation
• Mathematical ideas and techniques by calculating substrate requirements
• Problem-solving skills by recognising proofing faults and determining adjustments to correct them
• Use of technology by using monitoring equipment and interpreting readouts

Required knowledge:
The following knowledge must be assessed as part of this unit:

Job requirements

• What would you do if vital information was missing from the job ticket?
• What checks were undertaken prior to set up (availability of materials etc.)?

Flexographic printing plates and cylinders or sleeves or plate mounting sheets

• What precautions should be taken to avoid damaging plates and cylinders?

Reel in-feed

• What OHS factors need to be considered when operating the reel in-feed and delivery system?
• How was the printing side of the material chosen?
• What would be the effect of low web tension on the print?
• What other types of web splices could be used appropriately for the job?

Sheet in-feed

• What OHS factors need to be considered when operating the sheet in-feed and delivery system?
• Why is the sheet normally set up in the middle of the machine?
• What effect does side lay selection have on the job?
• How would the appropriate front lays be selected?
• What determines the position of the sheet before it is transported to the printing unit?
• How would a register check be carried out?
• Why is a two-sheet cut used on most feeders?
• How does the machine know if a sheet is missing or late?

Reel delivery system

• What would be the effect of excessive web tension at the rewind of the machine?
• How would you minimise THREE risks associated with the rewind of the machine?
Sheet delivery system

- Why is the application of spray powder sometimes advisable?
- What are the effects of too much spray powder?
- Why may slowdown devices be used in the delivery?
- What effect would excessive jogging have on the stack?

Selection and preparation of inks and additives

- What are the major environmental and OHS concerns with regard to inks and additives?
- How is the suitability of ink matched to the particular job?
- What would happen if the ink were too viscose?
- How would an ink that was slightly light be modified to meet the needs of the job?
- What methods are available to check the ink for correct colour?
- Who passes the colour prior to running the job?

Machine set up

- What OHS factors need to be considered when setting up the machine?
- How are the machine specifications determined, relating to the specific job?
- What steps should be taken to ensure that the inking system is adjusted correctly?
- Why is the inking system ink level maintained at a certain level?
- What precautions are necessary when handling doctor / chamber blades?
- What is the optimum make ready speed for the job?

Basic in-line processes

- What steps are taken to incorporate the in-line processes into the make ready?
- How is the equipment used in in-line processing protected against damage during set up?
- What precautions should be taken if UV drying is utilised to dry the ink film?

Proofing and adjustment

- What methods can be used to minimise waste during make ready?
- What procedures are followed to have the print approved?
- What quality control measurements should be applied to the proof to test against known standards?
- What do you check on the initial print prior to running?
- How are the settings to be adjusted determined?
- What processes are used to plot the success of the machine adjustment?
- How are the final results recorded for future reference?

Relevant test procedures

- Identify and describe the tests for scuffing and coefficient of friction.
- Under what circumstances should these tests be applied?

Leaching

- What is leaching?
- Under what circumstances might it occur?
- How can it be rectified?

Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
What information is included in these documents?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
- Range of standard inks commonly used in colour printing

Colour matching systems
- Use of visual colour assessment and densitometry to match basic standard colours under controlled lighting conditions

Machines
- A range of stack, in-line and central impression flexographic printing machines with manual, semi-automated, fully automated or computerised process control

Design
- Colours, simple graphics and text. Minor variation in registration and position

In-line processes
- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such

Substrate types
- Range of substrates within the major categories of paper, pressure sensitive material, board, corrugated board, plastics and related films, or metal

Substrate handling
- Wide or narrow reel and small or large sheet handling systems

Degree of autonomy
- Working to defined procedures under limited supervision

Routine
- Routine within this context relates to the set up and production of print runs. The set up of equipment and production are straightforward and do not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

**Critical aspects for assessment and evidence required to demonstrate competency**

Evidence of the following is essential:

- Set up flexographic printing machines for routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Demonstrate all safety devices on the machine
- Set up a press on TWO occasions for basic flexographic printing (if possible including at least ONE in-line process), according to manufacturer's specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

**Context of and specific resources for assessment**

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment

**Method of assessment**

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPSU201B Prepare, load and unload reels and cores on and off machine
- ICPSU202B Prepare, load and unload product on and off machine
- ICPSU207B Prepare machine for operation (basic)
- ICPSU211B Prepare ink and additives
- ICPPR211B Mount and proof flexographic plates for basic printing
- ICPPR214B Produce basic flexographic printed product
ICPPR314B  Produce complex flexographic printed product

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce non-routine flexographic printed product.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to operate a reel-fed flexographic press ensuring an efficient non-routine production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector
Printing

ELEMENT  PERFORMANCE CRITERIA

1. Maintain non-routine operation of reel transportation system
   1.1 Reel stand is monitored and adjusted to ensure efficient continuous operation
   1.2 Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation
   1.3 Substrate is added to process according to job instructions

2. Maintain non-routine operation of reel delivery system on web-fed machine
   2.1 Reel rewind section is monitored and adjusted to maintain correct tension and to ensure no marks, blemishes or damage to finished product
   2.2 Substrate is removed from process according to non-routine job instructions
   2.3 Sheeting section is monitored and adjusted to ensure quality and efficient product delivery
   2.4 Set-off / marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof

3. Maintain complex flexographic printing process
   3.1 Flexographic plate and plate cylinder or sleeve condition is monitored and adjusted to ensure the quality of printed product meets the standard of the approved proof
   3.2 Flexographic impression roller condition is monitored to ensure the quality of printed product meets the standard of approved proof
   3.3 Flexographic inking system and doctor blade condition are monitored and adjusted to ensure quality of printed product meets the standard of approved proof
   3.4 Drying systems are monitored and adjusted to ensure quality of printed product meets the standard of approved proof
   3.5 In-line printing / converting / binding / finishing processes are monitored and adjusted to ensure quality of product meets the standard of the approved proof
4. Maintain non-routine production process

4.1 Production process is operated in association with fellow workers and according to company specifications and planned daily schedule

4.2 Production is maintained within OHS requirements and company and manufacturer's specifications

4.3 Manual and / or automatic control is used as per specification

4.4 Performance is monitored and verified using the process control system according to enterprise procedures

4.5 Ink performance, colour, register and position of print are monitored and adjusted throughout production run

4.6 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention

4.7 Process adjustments to eliminate problems are reported according to enterprise procedures

4.8 Faulty performance of equipment is identified and reported according to enterprise procedures

4.9 Waste is sorted according to enterprise procedures

5. Identify and rectify faults

5.1 Problem in flexographic machine is identified and reported according to enterprise procedures

5.2 Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level

5.3 Flexographic machine operation is checked to ensure correct operation

5.4 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures

6. Conduct shutdown of production process

6.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures

6.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

6.3 Reels and cores are removed from press

6.4 Unused ink is drained back to containers and correctly labelled and stored according to manufacturer / supplier specifications and enterprise procedures

6.5 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

6.6 All product is removed from operating area
<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>Clean and wash up printing machine at end of print run</td>
</tr>
<tr>
<td>7.1</td>
<td>Cylinders or sleeves, plate and roller surfaces are cleaned ready for next run</td>
</tr>
<tr>
<td>7.2</td>
<td>Inking rollers and doctor blades or chamber blade systems are cleaned with correct solvents according to OHS guidelines</td>
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<tr>
<td>7.3</td>
<td>Ink pumps, tanks and hoses are cleaned correctly</td>
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<tr>
<td>7.4</td>
<td>Impression rollers / central impression and press rollers are cleaned</td>
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<tr>
<td>7.5</td>
<td>In-line printing / converting / binding / finishing units are cleaned ready for next run</td>
</tr>
<tr>
<td>7.6</td>
<td>Reel feed, transportation and delivery systems are disengaged and cleaned ready for next run</td>
</tr>
<tr>
<td>7.7</td>
<td>Press is lubricated and protected according to duration of shutdown</td>
</tr>
<tr>
<td>7.8</td>
<td>Production records or other documentation are accurately completed where required by enterprise procedures</td>
</tr>
</tbody>
</table>
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by interpreting the job brief and providing advice to clients about options and limitations
• Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
• Planning and organising activities by providing information about time and materials requirements for production scheduling
• Teamwork when maintaining the production process in association with others
• Mathematical ideas and techniques by calculating substrate requirements, plate position and pressures
• Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
• Use of technology by using monitoring equipment and making adjustments

Required knowledge:
The following knowledge must be assessed as part of this unit:

Reel transportation and web control
• What could cause the reel to wander?
• What could cause the web to break at the unwind unit?
• What is the difference between a "flying paster" and "zero speed" type reel-stand?
• What print fault would result from the reel being run out of centre?
• What possible faults in the unwind section could cause a web break?

Reel delivery for rewinding and sheeting
• What are the OHS risks associated with rewinding and sheeting?
• What safety feature is in the delivery system if the web jams up?
• Why would the sheet cut-off wander?
• What is the effect of poorly adjusted nip rollers when rewinding and sheeting?

Printing and drying units
• What could be the result if the plate lifts on the leading edged during a print run?
• How could a build-up of ink on the impression cylinder affect the printed product?
• What could cause the ink to foam in the ink tray?
• What is the effect of too much reducer in the ink?
• What action reduces wear of the doctor blade?
• Why is it necessary that all solvents be removed from the final ink film?
• What is the link between driers and set off and marking?
• What causes UV ink to dry?
• What could cause the substrate to distort?
• What would be the effect in the chillers if the drying temperature was too low?
• What is the effect of incorrect drying temperature on the finished product?
• Why is it not advisable to eat or drink near the machine when using UV inks?

In-line processes
• Why is it necessary to frequently examine the in-line components of the job?
• How is the consistency of the punching unit checked?
• What would be the result of excessive pressure on the slitters?

Maintaining production process
• What safety features within the organisation aid in maintaining effective production?
• Who would be held legally responsible for the removal of machine guards and / or disconnection of micro switches?
• What is the effect of inadequate communication within the work team on a flexographic printing machine?
• What are the ramifications if machine guards are removed and / or micro switches are disconnected on a machine?
• What other measurement besides optimum solid ink density can be measured to assess print quality?
• What is the most accurate method of checking register during a production run?
• Why is it necessary to take immediate action when production problems are anticipated?
• What action is taken to eliminate further processing of unacceptable printed product?
• What will be the result to the substrate if the relative humidity is increased in the press room?
• What is the procedure to care for a newly delivered substrate to the press room?
• Why should waste be sorted?
• What is the advantage of keeping reusable waste?

Client liaison
• What industry standards can be applied to enhance effective communication with the client?
• What are the necessary procedures that the client should follow to "OK" a printed product?

Flexographic machine operating problems
• When would it be necessary to call service personnel to correct a machine problem?
• What enterprise procedures are in place to report any machine operating problems?

Shutdown procedures
• What would be the result if correct shutdown procedures were not followed?
• Why is it necessary that correct shutdown procedures are conducted with fellow workers?
• What advantages result from proper labelling and storage of excess inks and materials?
• Why should the printed product be clearly labelled prior to removal from the press room?
• What further operations are required for printed reels upon removal from the printing machine?
• How should the printed job be stored after removal from the printing machine?

Cleaning and washing up the printing unit
• What OHS concerns should be observed when handling ink?
• What safety precautions should be observed when cleaning the printing cylinders?
• Why is it necessary to thoroughly clean and wash up the printing unit prior to the next print run?
• Why should the anilox cells be thoroughly cleaned?
• How can plates be stored so as to minimise damage?

Cleaning feed, transportation, delivery and in-line sections
What OHS precautions should be observed when cleaning these sections of the machine?
Why is it necessary to maintain a clean substrate handling section of the machine?

Completing production records

- How are completed records used in the final analysis of the job?
- What are the benefits of comprehensive records when considering the production of future jobs?

Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?
- What other sources of information are available?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
- Range of inks commonly used in 4 or more colour printing, including standard and special colours

Colour matching systems
- Use of viscosity controls, densitometers and spectrophotometry

Machines
- Range of stack, in-line and central impression flexographic printing machines with manual, semi-automated, fully automated or computerised process control

Design
- 4 or more colours, complex graphics and text. Critical "tight" registration, fit and position, registration should be at least that required for four-colour process work

In-line processes
- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such

Substrate types
- Range of substrates within the major categories of paper, pressure sensitive material, board, corrugated board, plastics and related films, or metal
Substrate handling

- Wide and narrow reel delivery systems

Degree of autonomy

- Working independently in consultation with others

Non-routine

- Non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Operate a reel-fed flexographic press ensuring an efficient 3 or more colour production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Monitor production output and make necessary adjustments to maintain print quality on a flexographic machine whilst producing a complex print on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to job specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- flexographic press
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR411B Mount and demount flexographic plates for complex printing
- ICPPR413B Set up for complex flexographic printing
ICPPR321B  
**Unit Descriptor**  
This unit describes the performance outcomes, skills and knowledge required to set up for routine gravure printing.

**Employability Skills**  
This unit contains employability skills.

**Application of the Unit**  
This unit requires the individual to set up gravure printing machines for routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.

**Unit Sector**  
Printing

### ELEMENT PERFORMANCE CRITERIA

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<thead>
<tr>
<th>ELEMENT</th>
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<tbody>
<tr>
<td>1. Confirm routine job specifications</td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Job requirements are read and interpreted from job documentation or production control system</td>
</tr>
<tr>
<td>1.2</td>
<td>Set up is carried out correctly in minimum time with minimum wastage</td>
</tr>
<tr>
<td>1.3</td>
<td>Availability of all job related components is checked</td>
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<tr>
<td>2. Set up reels</td>
<td></td>
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<tr>
<td>2.1</td>
<td>Unwind and rewind reels is are set up and adjusted according to job specifications</td>
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<td>2.2</td>
<td>Webbing procedures are carried out according to job specifications</td>
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<td>2.3</td>
<td>Web-control system is set up and adjusted according to job specifications</td>
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<tr>
<td>2.4</td>
<td>Reels are spliced / joined according to job specifications</td>
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<td>2.5</td>
<td>Printed web viewing devices are set up and adjusted according to job specifications</td>
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<td>2.6</td>
<td>The folder and sheeter are set up and adjusted according to job specifications</td>
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<tr>
<td>2.7</td>
<td>Set off / marking prevention devices are set up and adjusted according to job specifications</td>
</tr>
<tr>
<td>3. Select and prepare inks and additives (basic)</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Inks, dyes or additives are selected according to job specifications and end-user requirements</td>
</tr>
<tr>
<td>3.2</td>
<td>Quality and suitability of inks, dyes or additives are checked and appropriate action is taken</td>
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<tr>
<td>3.3</td>
<td>Inks, dyes and additives are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste</td>
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<tr>
<td>3.4</td>
<td>Correct colour and weight / volume of ink are mixed and prepared to match the requirements of the printing process and job specifications</td>
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<tr>
<td>3.5</td>
<td>Formulation of the ink, colour match and the approved colour are appropriately recorded</td>
</tr>
<tr>
<td>3.6</td>
<td>Inks, dyes and additives are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions to prevent damage and hazards to personnel and prolong shelf life</td>
</tr>
</tbody>
</table>
4. Set up machine for basic gravure printing
   4.1 Gravure cylinders are selected, installed, set up and adjusted according to job specifications
   4.2 Impression roller is set up and adjusted according to job specifications
   4.3 Inking system / doctor blade is set up and adjusted according to the gravure process and job specifications
   4.4 Drying system is set up and adjusted according to job specifications

5. Conduct proof run
   5.1 Material to be used for proof is organised correctly
   5.2 Machine is operated according to manufacturer's and enterprise procedures to produce a specified proof
   5.3 Proof is visually inspected and / or tested or laboratory testing organised according to enterprise procedures
   5.4 Production does not commence without client OK or authority where appropriate
   5.5 If necessary, results are interpreted and adjustments made according to product and machine specifications
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by interpreting job tickets and requirements
• Collecting, analysing and organising information by collecting and assessing data about printing process and machine specifications and characteristics and how these interact
• Planning and organising activities by providing input into production scheduling about time requirements for set up to ensure efficient operation
• Teamwork when working with other workers to coordinate set up to ensure efficient operation
• Mathematical ideas and techniques by calculating cylinder position and substrate requirements for the job
• Problem-solving skills by recognising proofing faults and determining adjustments to correct them
• Use of technology by using monitoring equipment and interpreting readouts

Required knowledge:
The following knowledge must be assessed as part of this unit:

Job requirements
• What would you do if vital information was missing from the job ticket?
• What checks were undertaken prior to set up (availability of materials etc.)?

Cylinders
• How were the correct cylinders chosen for the job?
• Name THREE important considerations when handling gravure cylinders?
• What parts of the unit need to be checked to ensure the cylinder is correctly installed?

Reel in-feed on the machine
• What OHS factors need to be considered when operating the reel in-feed and delivery systems?
• How was the printing side of the material chosen?
• What would be the effect of low web tension on the print?
• What other types of web splices could be used appropriately for the job?

Delivery system on the machine
• Name THREE risks associated with the rewind of the machine.
• What would be the effect of excessive web tension at the rewind of the machine?

Selection and preparation of inks and additives
• What are the environmental and OHS concerns with regard to inks and additives?
• How is the suitability of ink matched to the particular job?
• What would happen if the ink were too viscose?
• How would an ink that was slightly light be modified to meet the needs of the job?
• What methods are available to check the ink for correct colour?
• Who passes the colour prior to running the job?
Machine set up

- What precautions are necessary when handling doctor blades?
- How are the machine specifications determined, relating to the specific job?
- What steps should be taken to ensure that the inking system was adjusted correctly?
- Why is the inking system ink level maintained at a certain level?
- What is the optimum make ready speed for the job?

Basic in-line processes

- What steps are taken to incorporate the in-line processes into the make ready?
- How is the equipment used in in-line processing protected against damage during set up?

Proofing and adjustment

- What methods can be used to minimise waste during make ready?
- What procedures are undertaken to have the print approved?
- What quality control measurements should be applied to the proof to test against known standards?
- What do you check on the initial print prior to running?
- How are the settings to be adjusted determined?
- What process is used to plot the success of the machine adjustment?
- How are the final results recorded for future reference?

Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings

- Range of standard inks commonly used in 1-2 colour printing

Colour matching systems

- Use of visual colour assessment and densitometry to match basic standard colours under controlled lighting conditions

Machines

- A range of in-line gravure printing machines with manual, semi-automated, fully automated or computerised process control

Design

- 1-2 colours, simple graphics and text. Minor variations in registration and position
In-line processes
- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g., flat-bed cutting, folding) it should be assessed as such.

Substrate types
- Range of substrates within the major categories of paper, board, or plastics or metal.

Substrate types
- Wide or narrow reel handling systems.

Degree of autonomy
- Working to defined procedures under limited supervision.

Routine
- Routine within this context relates to the set up and production of print runs. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis.

EVIDENCE GUIDE
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement, and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency
Evidence of the following is essential:
- Correctly set up gravure printing machines for routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.
- Demonstrate use of computerised control, monitoring, and data entry systems if available and appropriate.
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
- Demonstrate all safety devices on the machine.
- Set up a press on TWO occasions for basic gravure printing (if possible including at least ONE in-line process) according to manufacturer's specifications, enterprise procedures, and the Performance Criteria.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- gravure printing machine with in-line units

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPSU201B Prepare, load and unload reels and cores on and off machine
- ICPSU207B Prepare machine for operation (basic)
- ICPSU211B Prepare ink and additives
- ICPPR322B Produce basic gravure printed product
**ICPPR322B**  
**Produce complex gravure printed product**

**Unit Descriptor**
This unit describes the performance outcomes, skills and knowledge required to produce non-routine gravure printed product.

**Employability Skills**
This unit contains employability skills.

**Application of the Unit**
This unit requires the individual to operate a gravure press ensuring an efficient non-routine production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

**Unit Sector**
Printing

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
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</table>
| 1. Maintain non-routine operation of reel transportation system | 1.1 Reel stand is monitored and adjusted to ensure efficient continuous operation  
1.2 Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation  
1.3 Substrate is added to process according to job instructions |
| 2. Maintain non-routine operation of reel delivery system | 2.1 Reel rewind section is monitored and adjusted to maintain correct tension and to ensure no marks, blemishes or damage to finished product  
2.2 Substrate is removed from process according to job instructions  
2.3 Sheeting section is monitored and adjusted to ensure quality and efficient product delivery  
2.4 Set-off / marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof |
| 3. Maintain complex gravure printing process | 3.1 Gravure cylinder condition is monitored and adjusted to ensure the quality of printed product meets the standard of the sample sheet  
3.2 Gravure impression roller condition is monitored and maintained to ensure the quality of printed product meets the standard of sample sheet  
3.3 Gravure inking system and doctor blade are monitored and adjusted to ensure quality of printed product meets the standard of sample sheet  
3.4 Drying systems are monitored and adjusted to ensure quality of printed product meets the standard of approved proof |
| 4. Maintain operation of in-line processes | 4.1 In-line printing / converting / binding / finishing processes are monitored  
4.2 In-line printing / converting / binding / finishing process are adjusted to ensure quality of product meets the standard of the approved proof |
5. Maintain non-routine production process

5.1 Production process is operated in association with fellow workers and according to company specifications and planned daily schedule

5.2 Production is maintained within OHS requirements and company and manufacturer's specifications

5.3 Manual and / or automatic control is used as per specification

5.4 Performance is monitored and verified using the process control system according to enterprise procedures

5.5 Ink performance, colour, register and position of print are monitored and adjusted throughout production run

5.6 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention

5.7 Process adjustments to eliminate problems are reported according to enterprise procedures

5.8 Waste is sorted according to enterprise procedures

6. Identify and rectify faults

6.1 Problem in gravure machine is identified and reported according to enterprise procedures

6.2 Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level

6.3 Gravure machine operation is checked to ensure correct operation

6.4 Faulty performance of equipment is identified and reported according to enterprise procedures

7. Conduct shutdown of production process

7.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures

7.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

7.3 Unused ink is correctly labelled and stored according to manufacturer / supplier specifications and enterprise procedures

7.4 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

7.5 All product is removed from operating area

7.6 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures

7.7 Repair / adjustment is verified prior to resumption of operations
8. Clean and wash up printing machine at end of print run

8.1 Cylinders, plate and roller surfaces are cleaned ready for next run

8.2 Inking system is washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements

8.3 In-line printing / converting / binding / finishing units are cleaned ready for next run

8.4 Reel feed, transportation and delivery systems are disengaged and cleaned ready for next run

8.5 Sheet feed, transport and delivery systems are disengaged and cleaned ready for next run

8.6 Production records or other documentation are accurately completed where required by enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by interpreting the job brief and providing advice to clients about options and limitations
• Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
• Planning and organising activities by providing information about time and materials requirements for production scheduling
• Teamwork when maintaining the production process in association with others
• Mathematical ideas and techniques by calculating substrate requirements, plate position and pressures
• Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
• Use of technology by using monitoring equipment and making adjustments

Required knowledge:

The following knowledge must be assessed as part of this unit:

Reel transportation and web control

• What could cause the reel to wander?
• What could cause the web to break at the unwind unit?
• What is the difference between a "flying paster" and "zero speed" type reel-stand?
• What print fault would result from the reel being run out of centre?
• What possible faults in the unwind section could cause a web break?

Reel delivery for rewinding and sheeting

• What are the OHS risks associated with rewinding and sheeting?
• What safety feature is in the delivery system if the web jams up?
• Why would the sheet cut-off wander?
• What is the effect of poorly adjusted nip rollers when rewinding and sheeting?

Printing and drying unit

• How could a build-up of ink on the impression cylinder affect the printed product?
• What could cause the ink to foam in the ink tray?
• What is the effect of too much reducer in the ink?
• What action reduces wear of the doctor blade?
• Why is it necessary that all solvents be removed from the final ink film?
• What is the link between driers and set off and marking?
• What could cause the substrate to distort?
• What would be the effect in the chillers if the drying temperature was too low?
• What is the effect of incorrect drying temperature on the finished product?

In-line processes

• Why is it necessary to frequently examine the in-line components of the job?
• How is the consistency of the punching unit checked?
• What would be the result of excessive pressure on the slitters?
• What is the benefit of identification numbers on jobs with multiple similar images?
• How is the ratio of print to in-line speed controlled?

Maintaining production process
• What is the effect of inadequate communication within the work team on a gravure printing machine?
• What safety features within the organisation aid in maintaining effective production?
• What are the ramifications if machine guards are removed and / or micro switches are disconnected on a machine?
• Who would be held legally responsible for the removal of machine guards and / or disconnection of micro switches?
• What is the most accurate method of checking register during a production run?
• Why is it necessary to take immediate action when production problems are anticipated?
• What action is taken to eliminate further processing of unacceptable printed product?
• What will be the result to the substrate if the relative humidity is increased in the press room?
• What is the procedure to care for a newly delivered substrate to the press room?
• Why should waste be sorted?
• What is the advantage of keeping reusable waste?
• Client liaison
• What industry standards can be applied to enhance effective communication with the client?
• What are the necessary procedures that the client should follow to "OK" a printed product?

Gravure machine operating problems
• When would it be necessary to call service personnel to correct a machine problem?
• What enterprise procedures are in place to report any machine operating problems?

Shutdown procedures
• What would be the result if correct shutdown procedures were not followed?
• Why is it necessary that correct shutdown procedures are conducted with fellow workers?
• What advantages result from proper labelling and storage of excess inks and materials?
• Why should the printed product be clearly labelled prior to removal from the press room?
• What further operations are required for printed reels upon removal from the printing machine?
• How should the printed job be stored after removal from the printing machine?

Cleaning and washing up the printing unit
• What OHS concerns should be observed when handling ink?
• What safety precautions should be observed when cleaning the printing cylinders?
• Why is it necessary to thoroughly clean and wash up the printing unit prior to the next print run?
• Why should the doctor blades be thoroughly cleaned?
• Why should doctor blades be handled with extreme care?
• How can printing cylinders be stored so as to minimise damage?

Cleaning feed, transportation, delivery and in-line sections
• What OHS precautions should be observed when cleaning these sections of the machine?
Why is it necessary to maintain a clean substrate handling section of the machine?

Completing production records

- How are completed records used in the final analysis of the job?
- What are the benefits of comprehensive records when considering the production of future jobs?

Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?
- What other sources of information are available?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

**Inks / coatings**
- Range of inks commonly used in 3 or more colour printing, including standard and special colours

**Colour matching systems**
- Use of viscosity controls, densitometers and spectrophotometry

**Machines**
- Range of stack, in-line and central impression printing machines with manual, semi-automated, fully automated or computerised process control

**Design**
- 3 or more colours, complex graphics and text. Critical "tight" registration, fit and position, registration should be at least that required for four-colour process work

**In-line processes**
- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such

**Substrate types**
- Range of substrates within the major categories of paper, pressure sensitive materials, board, plastics and related films, or metal
Substrate handling

- Wide and narrow reel handling systems

Degree of autonomy

- Working independently in consultation with others

Non-routine

- Non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Operate a gravure press ensuring an efficient non-routine production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Monitor production output and make necessary adjustments to maintain print quality on a gravure machine whilst producing a complex print on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to job specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- gravure printing machine and in-line units
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR421B Set up for complex gravure printing
ICPPR331B  
**Set up for basic lithographic printing**

This unit describes the performance outcomes, skills and knowledge required to set up for basic lithographic printing sheet-fed and web-fed machines, including small offset.

**Employability Skills**

This unit contains employability skills.

**Application of the Unit**

This unit requires the individual to set up either wide or narrow reel or sheet-fed lithographic printing machines for routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained in minimum time with minimum wastage.

**Unit Sector**

Printing

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<th>PERFORMANCE CRITERIA</th>
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<tr>
<td>1. Confirm job specifications</td>
<td>1.1 Job requirements are read and interpreted from job documentation or production control system&lt;br&gt;1.2 Standard set up is planned for carried out correctly in minimum time with minimum wastage&lt;br&gt;1.3 Availability of all job related components is checked</td>
</tr>
<tr>
<td>2. Set up reel system (OR Element 3)</td>
<td>2.1 Unwind and rewind reels is are set up and standard settings adjusted according to job specifications&lt;br&gt;2.2 Webbing procedures are carried out according to standard operating procedures and OHS&lt;br&gt;2.3 Web-control system is set up and standard settings adjusted according to job specifications&lt;br&gt;2.4 Reels are spliced / joined according to job specifications&lt;br&gt;2.5 Printed web viewing devices are set up and standard settings adjusted according to job specifications&lt;br&gt;2.6 The folder and sheeter are is set up and standard settings adjusted according to job specifications</td>
</tr>
<tr>
<td>3. Set up sheet system (OR Element 2)</td>
<td>3.1 Feeder and delivery sections are is set up and standard settings adjusted according to job specifications&lt;br&gt;3.2 Registration system is identified and adjusted according to job specifications&lt;br&gt;3.3 Sheet pick-up, and transportation, control and transfer systems is are set up and standard settings adjusted according to job specifications&lt;br&gt;3.4 Substrate is removed from process according to job instructions</td>
</tr>
</tbody>
</table>
4. Select and prepare inks and additives (basic)

4.1 Inks, dyes or additives are checked and appropriate action is taken and end-user requirements.

4.2 Quality and suitability of inks, dyes or additives are selected according to job specifications and end-user requirements.

4.3 Inks, dyes and additives are prepared according to OHS requirements, and manufacturer’s / supplier’s instructions with suitable precautions to minimise waste.

4.4 Correct colour and weight / volume of ink are mixed and prepared to match the requirements of the printing process and job specifications.

4.5 Formulation of the ink, colour match and the approved colour are appropriately recorded.

4.6 Inks, dyes and additives are appropriately labelled, handled and stored according to manufacturer’s / supplier’s instructions to prevent damage and hazards to personnel and prolong shelf life.

5. Set up machine for basic offset lithographic printing

5.1 Plate cylinder are set up and adjusted and lithographic plates are selected and installed according to job specifications.

5.2 Blanket and blanket cylinder are set up and adjusted according to job specifications.

5.3 Impression cylinder is set up and adjusted according to job specifications.

5.4 Inking system is set up and adjusted according to the lithographic process and job specifications.

5.5 Dampening system is set up and adjusted according to job specifications.

6. Conduct ok print run

6.1 Material to be used for proof ok sheet / section is organised correctly.

6.2 Machine is operated according to manufacturer’s and enterprise procedures to produce a specified proof ok / section.

6.3 Ok / section is visually inspected and / or tested or laboratory testing organised according to enterprise procedures.

6.4 Production does not commence without client OK or authority where appropriate.

6.5 If necessary, results are interpreted and adjustment are carried out according to product and machine specifications.
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting job tickets and requirements
- Collecting, analysing and organising information by collecting and assessing data about printing process and machine specifications and characteristics and how these interact
- Planning and organising activities by providing input into production scheduling about time requirements for set up to ensure efficient operation
- Teamwork when working with others to coordinate set up to ensure efficient operation
- Mathematical ideas and techniques by calculating plate position and substrate requirements for the job
- Problem-solving skills by recognising proofing faults and determining adjustments to correct them
- Use of technology by using monitoring equipment and interpreting readouts

Required knowledge:
The following knowledge must be assessed as part of this unit:

Interpreting job specifications
- What would you do if vital information was missing from the job ticket?
- What checks should be undertaken prior to set up (availability of materials etc)?

Preparing and fitting plates
- What problem can result from the cylinder not being cleaned prior to plate fitting?
- How is the grip edge of the plate identified?
- What would be the effect of over packing the printing plate cylinder?
- How could pitch lines be used to assist in plate installation?
- What tools or actions are likely to damage the plate?
- Why should plates be consistently tensioned?

Reel in-feed
- What OHS precautions must be observed when webbing up the machine?
- How do you determine the printing side of the material?
- What would be the effect of low web tension on the print?
- What is the purpose of nip rollers?
- What other types of web splices could be used appropriate for the job?

Sheet in-feed and transfer
- What OHS factors need to be considered when setting up the sheet in-feed and transfer systems?
- Why is the sheet normally set up in the middle of the machine?
- What effect does side lay selection have on the job?
- How would the appropriate front lays be selected?
- What determines the position of the sheet before it is transported to the printing unit?
- How would a register check be carried out?
- Why is a two-sheet cut used on most feeders?
- How does the machine know if a sheet is missing or late?
Reel delivery system

- What would be the effect of excessive web tension at the rewind of the machine?
- Name THREE risks associated with the rewind of the machine

Sheet delivery system

- Why is the application of spray powder sometimes advisable?
- What are the effects of too much spray powder?
- Why may slowdown devices be used in the delivery?
- What effect would excessive jogging have on the stack?

Preparation of inks and additives

- What are the main OHS and environmental concerns of inks and additives?
- What details are necessary to check the suitability of an ink for a job?
- What would happen if the ink were too tacky?
- How would an ink that was slightly light be modified to meet the needs of the job?
- What methods are available to check the ink for correct colour?
- Who passes the colour prior to running the job?

Machine set up

- What OHS factors need to be considered when setting up the machine?
- How are the cylinder (plate, blanket and impression) specifications determined for the specific job?
- What effects may an incorrectly set dampening system have on the job?
- Why does the ink profile vary across the machine?
- What is the optimum ink duct sweep?

Basic in-line processes

- In what machine position should you engage in-line processing units?
- What precautions are necessary when setting up in-line processing units?
- What precautions were taken if UV drying was utilised to dry the ink film?

Proofing and adjustment

- What methods can be used to minimise waste during make ready?
- What do you check on the initial print prior to running?
- How is the machine proof tested?
- What are the ideal conditions for inspecting the proof?
- What methods are available to check and adjust ink colour and consistency?
- What adjustments may have caused mis-register?
- What adjustments are made to position the image laterally?
- What adjustments are made to position the image circumferentially?
- Who has the final say in the "OK" of the job?

Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings  
• Range of standard inks commonly used in printing

Colour matching systems  
• Use of visual colour assessment to match basic standard colours under controlled lighting conditions

Machines  
• A range of single sheet, stream and reel-fed machines with manual, semi-automated, fully automated or computerised process control

Design  
• Simple graphics and text. Minor variation in registration and position

Substrate types  
• Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal

Substrate handling  
• Wide or narrow reel or large or small sheet handling systems

Degree of autonomy  
• Working to defined procedures under limited supervision

Routine  
• Routine within this context relates to the set up and production of print runs. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis
## EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

### Critical aspects for assessment and evidence required to demonstrate competency

<table>
<thead>
<tr>
<th>Evidence of the following is essential:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Set up either wide or narrow reel or sheet-fed lithographic printing machines for routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.</td>
</tr>
<tr>
<td>• Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.</td>
</tr>
<tr>
<td>• Demonstrate an ability to find and use information relevant to the task from a variety of information sources.</td>
</tr>
<tr>
<td>• Demonstrate all safety devices on the machine.</td>
</tr>
<tr>
<td>• Set up for TWO basic lithographic printing jobs according to manufacturer's specifications, enterprise procedures and the Performance Criteria.</td>
</tr>
<tr>
<td>• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.</td>
</tr>
</tbody>
</table>

### Context of and specific resources for assessment

<table>
<thead>
<tr>
<th>Assessment must ensure:</th>
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</thead>
<tbody>
<tr>
<td>• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.</td>
</tr>
<tr>
<td>• a lithographic printing machine.</td>
</tr>
</tbody>
</table>

### Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

| • direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate. |

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

| • ICPSU201B Prepare, load and unload reels and cores on and off machine. |
| • ICPSU202B Prepare, load and unload product on and off machine. |
| • ICPSU207B Prepare machine for operation (basic). |
| • ICPSU211B Prepare ink and additives. |
| • ICPPR232B Produce basic lithographic printed product. |
ICPPR332B Produce complex lithographic printed product

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce complex lithographic printed product.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to operate a lithographic press ensuring an efficient non-routine production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Maintain non-routine operation of reel system (OR Element 2)
   1.1 Reel stand and rewind sections are monitored and adjusted to maintain correct tension and to ensure no marks, blemished or damage to finished product and to ensure efficient continuous operation
   1.2 Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation
   1.3 Substrate is added to and removed from the process according to job instructions
   1.4 Sheeting section is monitored and adjusted to ensure quality and efficient product delivery
   1.5 Set-off / marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof

2. Maintain non-routine operation of sheet system (OR Element 1)
   2.1 Feeder and delivery sections are monitored and adjusted to ensure continuous and efficient feeding to machine
   2.2 Sheet pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operation
   2.3 Transfer systems are monitored and adjusted to ensure correct and continuous sheet handling and efficient operation
   2.4 Substrate is added to and removed from the process according to job instructions
   2.5 Set-off / marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof
3. Maintain complex lithographic printing process

3.1 Non-routine lithographic plate and plate cylinder condition are monitored and adjusted to ensure the quality of printed product meets the standard of the sample sheet

3.2 Non-routine lithographic blanket and blanket cylinder condition are monitored and adjusted to ensure the quality of printed product meets the standard of sample sheet

3.3 Non-routine lithographic impression cylinder condition is monitored and adjusted to ensure quality of printed product meets the standard of sample sheet

3.4 Non-routine lithographic inking system is checked and maintained to ensure quality of printed product meets the standard of sample sheet

3.5 Non-routine lithographic dampening system condition is monitored and adjusted to ensure quality of printed product meets the standard of sample sheet

3.6 Set off / marking prevention and drying system is monitored and adjusted to ensure quality of printed product meets the standard of sample sheet

3.7 Drying systems are monitored and adjusted to ensure quality of printed product meets the standard of approved proof

4. Maintain production process

4.1 Production process is operated in association with fellow workers and according to company specifications and planned daily schedule

4.2 Production is maintained within OHS requirements and company and manufacturer's specifications

4.3 Manual and / or automatic control is used as per specification

4.4 Performance is monitored and verified using the process control system according to enterprise procedures

4.5 Ink performance, colour, register and position of print are monitored and adjusted throughout production run

4.6 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention

4.7 Process adjustments to eliminate problems are reported according to enterprise procedures

4.8 Faulty performance of equipment is identified and reported according to enterprise procedures

4.9 Waste is sorted according to enterprise procedures

5. Identify and investigate lithographic machine operating problem

5.1 Problem in lithographic machine operation is investigated

5.2 Problem in lithographic machine is identified and reported according to enterprise procedures

6. Rectify minor lithographic machine faults

6.1 Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level

6.2 Lithographic machine operation is checked to ensure correct operation
7. Conduct shutdown of production process

7.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures

7.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

7.3 Unused ink is correctly labelled and stored according to manufacturer / supplier specifications and enterprise procedures

7.4 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

7.5 All product is removed from operating area

7.6 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures

7.7 Repair / adjustment is verified prior to resumption of operations

8. Clean and wash up printing machine at end of print run

8.1 Cylinders, plate and roller surfaces are cleaned ready for next run

8.2 Inking system and dampening system are washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements

8.3 In-line printing / converting / binding / finishing units are cleaned ready for next run

8.4 Reel feed, transportation and delivery systems are disengaged and cleaned ready for next run

8.5 Sheet feed, transport and delivery systems are disengaged and cleaned ready for next run

9. Complete records

9.1 Production records or other documentation are accurately completed where required by enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting the job brief and providing advice to clients about options and limitations
- Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when maintaining the production process in association with others
- Mathematical ideas and techniques by calculating substrate requirements, plate position and pressures
- Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
- Use of technology by using monitoring equipment and computerised production records

Required knowledge:
The following knowledge must be assessed as part of this unit:

Reel transportation and web control
- What OHS concerns are there when operating the reel transportation system?
- What could cause the reel to wander?
- What could cause the web to break at the unwind unit?
- What is the difference between a “flying paster” and “zero speed” type reel-stand?
- What print fault would result from the reel being run out of centre?
- What possible faults in the unwind section could cause a web break?

Sheet transportation and transfer
- What OHS concerns are there when operating the sheet transportation system?
- What would be result of worn suckers at the feeder suction head?
- What type of two sheet detection is on this machine?
- How much movement should the sheet have when being registered by the side lay?
- What could cause mis-register of the sheet at the feeder?
- What are the visible signs of the sheet being registered in the feeder?
- How can gripper malfunction affect sheet control and transfer?
- When would sheet transfer mechanisms require adjusting?
- What would cause the feeder stack to become uneven?
- What would be the result of the feeder stack not being loaded level?
- How can any unevenness of the feeder stack be rectified?

Reel delivery for rewinding and sheeting
- What are the OHS risks associated with rewinding and sheeting?
- What safety feature is in the delivery system if the web jams up?
- Why would the sheet cut-off wander?
- What is the effect of poorly adjusted nip rollers when rewinding and sheeting?
- What further operations are required for printed reels upon removal from the printing machine?
How should the printed job be stored after removal from the printing machine?
Why is it necessary to label each printed reel?

Sheet delivery
- What effect will machine speed have on sheet delivery?
- What is the advantage of spraying moving sheets with anti set off powder in the delivery?
- What items in the delivery could cause marking of the printed image?
- What remedial steps may be necessary to eliminate marking of the printed image?
- What is the function of a sheet decurler fitted to the delivery of some machines?
- What faults could result from incorrectly set grippers in the transfer section of a machine?
- How should the printed job be stored after removal from the printing machine?

Printing unit
- What could be the result if the plate develops a crack at the grip edge during a print run?
- What would be the effect of a sticky blanket surface?
- What print faults would result from the blanket not being tensioned correctly?
- What would be the cause of blanket packing creep during printing?
- How could a build-up of ink on the impression cylinder affect the printed product?
- What could cause the ink to lie back in the duct?
- What could cause ink stripping on the inking rollers?
- What print faults would result from excessive use of fountain solution on the plate?
- What is the recommended pH range for fountain solutions?
- What could cause the conductivity of the fountain solution to change over an eight-hour shift?
- What problems can be caused by excessive conductivity of the fountain solutions?

Drying unit
- Why is it not advisable to eat or drink near the machine when using UV inks?
- What is the link between driers and set off and marking?
- What causes UV ink to dry?
- What could cause the substrate to blister?
- What would be the effect in the chillers if the drying temperature was too low?
- What is the effect of incorrect drying temperature on the finished product?

In-line processes
- How is the consistency of the punching unit checked?
- What would be the result of excessive pressure on the slitters?
- What would be the result of a dirty former?
- What would be the result of defective pins in the folder?
- What is the result of adjusting the rollers at the base of the former?
- What could cause the web to jam up in the folder?

Maintaining production process
- What is the effect of inadequate communication within the work team on a lithographic printing machine?
- What safety features within the organisation aid in maintaining effective production?
- What are the ramifications if machine guards are removed and / or micro switches are disconnected on a machine?
- Who would be held legally responsible for the removal of machine guards and / or disconnection of micro switches?
• What is the disadvantage of using a closed looped system for automatic control of the printed product?
• What other measurement besides optimum solid ink density can be measured to assess print quality?
• What is the most accurate method of checking register during a production run?
• Why is it necessary to take immediate action when production problems are anticipated?
• What action is taken to eliminate further processing of unacceptable printed product?
• How will a stack of paper be affected if the relative humidity is increased in the press room?
• What is the procedure to care for a newly delivered skid of paper to the press room?
• Why should waste be sorted?
• What is the advantage of keeping reusable waste?

Client liaison
• What industry standards can be applied to enhance effective communication with the client?
• What are the necessary procedures that the client should follow to "OK" a printed product?

Lithographic machine operating problems
• When would it be necessary to call service personnel to correct a machine problem?
• What enterprise procedures are in place to report any machine operating problems?

Shutdown procedures
• What would be the result if correct shutdown procedures were not followed?
• Why is it necessary that correct shutdown procedures are conducted with fellow workers?
• What advantages result from proper labelling and storage of excess inks and materials?
• Why should the printed product be clearly labelled prior to removal from the press room?

Cleaning and washing up the printing unit
• What OHS concerns should be observed when handling ink?
• What safety precautions should be observed when cleaning the printing cylinders?
• Why is it necessary to thoroughly clean and wash up the printing unit prior to the next print run?
• Why should the offset rubber blanket be washed with water as well as some other form of solvent?
• How can plates be stored so as to minimise damage?

Cleaning feed, transportation, delivery and in-line sections
• What are the OHS precautions to be observed when cleaning these sections of the machine?
• Why is it necessary to maintain a clean substrate handling section of the machine?

Completing production records
• How are completed records used in the final analysis of the job?
• What are the benefits of comprehensive records when considering the production of future jobs?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and...
where are they kept?
• What information is included in these documents?
• What other sources of information are available?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
• Wide range of inks commonly used in printing

Colour matching systems
• Use of densitometers and spectrophotometry

Machines
• Range of single sheet, stream-fed or reel-fed printing machines with manual, semi-automated, fully automated or computerised process control. Includes machines with digitally imaged plates

Design
• Complex graphics and text. Critical "tight" registration, fit and position, registration should be at least that required for four-colour process work

In-line processes
• Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such

Substrate types
• Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal

Substrate handling
• Wide and narrow reel, and large and small sheet handling systems

Degree of autonomy
• Working independently in consultation with others
Non-routine

- Non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Operate a lithographic press ensuring an efficient non-routine production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
- Monitor production output and make necessary adjustments to maintain print quality on a lithographic machine whilst producing a complex print on TWO occasions (if possible using different types and sizes of substrates and if possible including at least TWO in-line processes) according to job specifications, enterprise procedures and the Performance Criteria.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
- lithographic printing machine.
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR431B Set up for complex lithographic printing
ICPPR341B

Unit Descriptor

Set up for basic pad printing

This unit describes the performance outcomes, skills and knowledge required to set up for basic pad printing.

Employability Skills

This unit contains employability skills.

Application of the Unit

This unit requires the individual to set up pad printing machines for routine print jobs. The individual will set up manual pre- and post-treatment processes, conduct a proof run and adjust settings to ensure production speeds are attained.

Unit Sector

Printing

ELEMENT PERFORMANCE CRITERIA

1. Confirm job specifications
   1.1 Job requirements are read and interpreted from job documentation or production control system
   1.2 Set up is carried out correctly in minimum time with minimum wastage
   1.3 Availability of all job related components is checked

2. Install tampons (printing pads) into machine
   2.1 Appropriate tampons are selected according to job specifications
   2.2 Tampons are secured into machine

3. Set up fixtures onto machine bed
   3.1 Appropriate fixtures are selected and secured to xy table
   3.2 Height of machine bed is adjusted to suit size of object to be printed
   3.3 Xy table of machine bed is adjusted to suit position of image on object

4. Select and prepare inks and additives
   4.1 Inks and additives are selected according to job specifications and end-user requirements
   4.2 Quality and suitability of inks and additives are checked and appropriate action is taken
   4.3 Inks and additives are prepared according to OHS requirements and manufacturer's / supplier's instructions with suitable precautions to minimise waste
   4.4 Correct colour and weight / volume of ink are mixed and prepared to match the requirements of the printing process and routine job specifications
   4.5 Formulation of the ink, colour match and the approved colour are appropriately recorded
   4.6 Inks and additives are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions to prevent damage and hazards to personnel and prolong shelf life
| 5. Set up machine for basic pad printing | 5.1 Plate holder is set up and adjusted according to job specifications  
5.2 Appropriate plate and plate holder are selected and plate is secured into plate holder  
5.3 Tampons are set up and adjusted according to job specifications  
5.4 Spatula and doctor blade are set up and adjusted according to the requirements of the pad printing process and routine job specifications OR  
5.5 Ink cup is set up and adjusted according to job specifications |
| --- | --- |
| 6. Set up manual pre- and post-treatment processes | 6.1 Manual loading is set up according to routine object requirements and job specifications  
6.2 Manual pre-treatment is set up to suit routine object and according to job specifications  
6.3 Drying racks are set up to suit object and according to job specifications |
| 7. Conduct proof run | 7.1 Material to be used for proof is organised correctly  
7.2 Machine is operated according to manufacturer’s requirements and enterprise procedures to produce a specified proof  
7.3 Proof is visually inspected and / or tested or laboratory testing is organised according to enterprise procedures  
7.4 Production does not commence without client approval or authority where appropriate  
7.5 Results are interpreted and adjustments are carried out according to product and machine specifications |
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

**Required skills:**

The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting job tickets and requirements
- Collecting, analysing and organising information by collecting and assessing data about printing process and machine specifications and characteristics and how these interact
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when working with others to coordinate set up to ensure efficient operation
- Mathematical ideas and techniques by calculating cliche and tampon position and substrate requirements for the job
- Problem-solving skills by recognising proofing faults and determining adjustments to correct them
- Use of technology by using monitoring equipment and interpreting readouts

**Required knowledge:**

The following knowledge must be assessed as part of this unit:

**Substrate identification**

- What class of substrate does this (given) object come from?

**Ink selection**

- How do you determine if an ink will suit a particular substrate?
- How do you determine if an ink is mixed to the correct viscosity?
- What is the pot life of a two-component ink?

**Pad selection**

- How do you determine the correct pad shape for these TWO (given) applications?
- What effect do pad shape and hardness have on print quality?
- What are the ideal storage conditions for pads?

**Plate selection**

- How do you determine correct plate type for these THREE (given) applications?

**Doctor blades**

- What OHS concerns are there when setting presses and doctor blades?
- How do you adjust the machine so that doctor blade is operating correctly?
- What is the effect of a damaged doctor blade?

**Pre- and post-treatment requirements**

- What OHS concerns are there when pre- and post-treating substrates?
- How would you pre-treat an oily surface to ensure it is ready for printing?

**Print problem identification and correction**

- What are the causes and solutions for FOUR common print problems (eg hairlines around image, loss of density in the centre of a solid image, fine lines of ink running
through image, distortion of image)?

**Information sources**

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?

**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

**Inks / coatings**

- Range of standard inks commonly used in single colour printing

**Colour matching systems**

- Use of visual colour assessment to match basic standard colours under controlled lighting conditions

**Machines**

- A range of pad printing machines with manual, semi-automated or computerised operation

**Design**

- Single colour simple graphics and text. Minor variations in registration and position

**Pre- and post-treatment processes**

- Range of pre- and post-treatment process commonly used in pad printing

**Substrate types**

- Range of substrates within the major categories of paper, wood, glass (ceramics), plastics, metal

**Substrate handling**

- Manual handling

**Degree of autonomy**

- Working to defined procedures under limited supervision

**Routine**

- Routine within this context relates to the set up and production of print runs. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Set up pad printing machines for routine print jobs. The individual will set up manual pre- and post-treatment processes and conduct a proof run and adjust settings to ensure production speeds are attained.
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
- Demonstrate all safety devices on the machine.
- Set up a machine for basic pad printing on TWO occasions (if possible on different substrates) to meet manufacturer's and job specifications, enterprise procedures and the Performance Criteria.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
- pad printing machine.

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPSU202B Prepare, load and unload product on and off machine
- ICPSU207B Prepare machine for operation (basic)
- ICPSU211B Prepare ink and additives
- ICPPR242B Produce basic pad printed product
**ICPPR342B Produce complex pad printed product**

**Unit Descriptor**
This unit describes the performance outcomes, skills and knowledge required to produce complex pad printed product.

**Employability Skills**
This unit contains employability skills.

**Application of the Unit**
This unit requires the individual to operate a pad printing machine ensuring an efficient non-routine production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

**Unit Sector**
Printing

<table>
<thead>
<tr>
<th><strong>ELEMENT</strong></th>
<th><strong>PERFORMANCE CRITERIA</strong></th>
</tr>
</thead>
</table>
| 1. Maintain non-routine pad printing process | 1.1 Location of objects into fixtures is monitored and adjusted if necessary  
1.2 Printing plates condition is monitored to ensure the quality of printed product meets the standard of the approved proof  
1.3 Printing pads condition is monitored and maintained to ensure the quality of printed product meets the standard of approved proof  
1.4 Spatulas and doctor blades are monitored and adjusted to ensure quality of printed product meets the standard of approved proof OR  
1.5 Ink cups are monitored and adjusted to ensure quality of printed product meets the standard of approved proof  
1.6 Printing ink viscosity is monitored and adjusted to ensure quality of printed product meets the standard of approved proof |
| 2. Maintain in-line systems | 2.1 In-line loading is monitored and adjusted to ensure quality of printed product meets the standard of approved proof  
2.2 In-line pre-treatment is monitored and adjusted to ensure quality of printed product meets the standard of approved proof  
2.3 In-line drying is monitored and adjusted to ensure quality of printed product meets the standard of approved proof  
2.4 In-line ejection is monitored and adjusted to ensure quality of printed product meets the standard of approved proof |
3. Maintain non-routine production process

3.1 Production process is operated in association with fellow workers and according to company specifications and planned daily schedule

3.2 Production is maintained within OHS requirements and company and manufacturer's specifications

3.3 Manual and/or automatic control is used as per specification

3.4 Performance is monitored and verified using the process control system according to enterprise procedures

3.5 Ink performance, colour, register and position of print are monitored and adjusted throughout production run

3.6 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention

3.7 Process adjustments to eliminate problems are reported according to enterprise procedures

3.8 Waste is sorted according to enterprise procedures

4. Identify and rectify faults

4.1 Problem in pad printing machine operation is identified and reported according to enterprise procedures

4.2 Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level

4.3 Pad printing machine operation is checked to ensure correct operation

4.4 Faulty performance of equipment is identified and reported according to enterprise procedures

5. Conduct shutdown of production process

5.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures

5.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

5.3 Unused ink is correctly labelled and stored according to manufacturer/supplier specifications and enterprise procedures

5.4 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

5.5 All product is removed from operating area

5.6 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures

5.7 Repair/adjustment is verified prior to resumption of operations

6. Clean and wash up printing machine at end of print run

6.1 Plates and pads are cleaned ready for next run

6.2 Inking system is washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements

6.3 Pre- and post-treatment units are cleaned ready for next run

6.4 Production records or other documentation are accurately completed where required by enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by interpreting the job brief and providing advice to clients about options and limitations
• Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
• Planning and organising activities by providing information about time and materials requirements for production scheduling
• Teamwork when maintaining the production process in association with others
• Mathematical ideas and techniques by calculating substrate requirements, plate position and pressures
• Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
• Use of technology by using monitoring equipment and computerised production records

Required knowledge:
The following knowledge must be assessed as part of this unit:

OHS
• What are the major OHS concerns when operating this machine?
• Where are the MSDSs stored and what information do they contain?

Different machine cycle modes
• Explain how the colour density of a light image on a dark substrate can be improved by selection of a different machine cycle mode.
• How do you select the appropriate machine cycle mode to provide the highest production output for a particular product?
• Describe TWO special cycle modes that are available on your machine and their application.

Inks
• How do you determine that ink has been mixed to the correct viscosity?
• How do you correct ink viscosity during production?
• What are TWO causes of unreleased ink remaining on the printing pad and how do you identify them?
• How does the addition of a catalyst affect the pot life of ink and what other factors affect pot life?

Pads
• How do you recognise a damaged pad?
• What is the correct method of cleaning a pad during production?
• In multicoloured printing what can be the effect of different pad shapes for different colours?

Pre- and post-treatment requirements
• How do you determine the time the ink should take to cure before scratch and adhesion tests can be performed?
• What method can be used to check for correct pre-treatment of polypropylene during production?
• How do ensure that drying conditions are correct for the product?

Print problem identification and correction
• Describe FOUR effects that will be visible in the image if the ink viscosity is incorrect.
• How do you identify the cause of incorrect registration and prevent its recurrence?
• What would cause a fine coating of ink over the whole cliche surface?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
• Range of standard inks commonly used in multicoloured printing

Colour matching systems
• Use of visual colour assessment to match basic standard colours and / or Pantone shades under controlled lighting conditions

Machines
• A range of pad printing machines with manual, semi-automated, fully automated or computerised operation

Design
• Multicoloured, complex graphics and text. Critical tight registration, fit and position
• Pre- and post-treatment processes
• Range of pre- and post-treatment techniques used in pad printing

Substrate types
• Range of substrates within the major categories of paper, wood, glass (ceramics), plastics, metal

Substrate handling
• Manual handling
Degree of autonomy  
- Working independently under limited supervision

Non-routine  
- Non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Operate a pad printing machine ensuring an efficient non-routine production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Produce TWO complex pad printing jobs (if possible on different substrates) according to job specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- a pad printing machine
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR441B Set up for complex pad printing
ICPPR351B

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to set up for basic relief printing.

Employability Skills

This unit contains employability skills.

Application of the Unit

This unit requires the individual to set up reel- or sheet-fed platen, cylinder or rotary printing machines for routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.

Unit Sector

Printing

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Confirm job specifications | 1.1 Job requirements are read and interpreted from job documentation or production control system  
1.2 Set up is carried out correctly in minimum time with minimum wastage  
1.3 Availability of all job related components is checked |
| 2. Set up reel system (OR Element 3) | 2.1 Unwind and rewind reels is are set up and adjusted according to job specifications  
2.2 Webbing procedures are carried out and web-control system is set up and adjusted according to job specifications  
2.3 Reels are spliced / joined according to job specifications  
2.4 Printed Web viewing devices are set up and adjusted according to job specifications  
2.5 Folder and sheeters are set up and adjusted according to job specifications  
2.6 Set off / marking prevention devices are set up and adjusted according to job specifications |
| 3. Set up sheet transportation system on sheet-fed machine (OR Element 2) | 3.1 Feeder and delivery sections are is set up and adjusted according to job specifications  
3.2 Sheet pick-up and transportation system is set up and adjusted according to job specifications  
3.3 Transfer and control system systems are set up and adjusted according to job specifications  
3.4 Set off / marking prevention devices are set up and adjusted according to job specifications  
3.5 Substrate is added to and removed from process according to job instructions |
4. Select and prepare inks and additives (basic)

4.1 Quality and suitability of inks, dyes or additives are selected according to job specifications and end-user requirements

4.2 Quality and suitability of inks, dyes or additives are checked and appropriate action is taken

4.3 Inks, dyes and additives are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste

4.4 Correct colour and weight / volume of ink are mixed and prepared to match the requirements of the printing process and job specifications

4.5 Formulation of the ink, colour match and the approved colour are appropriately recorded

4.6 Inks, dyes and additives are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions to prevent damage and hazards to personnel and prolong shelf life

5. Set up machine for basic relief printing

5.1 Appropriate relief plates are selected and secured to the machine

5.2 Relief plates or formes or cylinders are positioned and set up and adjusted according to job specifications (platen and rotary)

5.3 Impression is set up and adjusted according to job specifications (platen and rotary)

5.4 Inking system is set up and adjusted according to the relief process and job specifications (platen and rotary)

5.5 Drying system is set up and adjusted according to job specifications

6. Conduct proof run

6.1 Material to be used for proof is organised correctly

6.2 Machine is operated according to manufacturer's and enterprise procedures to produce a specified proof

6.3 Proof is visually inspected and / or tested or laboratory testing organised according to enterprise procedures

6.4 Production does not commence without client OK or authority where appropriate

6.5 Results are interpreted and adjustment changes are carried out according to product and machine specifications to determine adjustment requirements
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting job tickets and requirements
- Collecting, analysing and organising information collecting and assessing data about printing process and machine specifications and characteristics and how these interact
- Planning and organising activities by providing input into production scheduling about time requirements for set up to ensure efficient operation
- Teamwork when working with others to coordinate set up to ensure efficient operation
- Mathematical ideas and techniques by calculating plate position and substrate requirements for the job
- Problem-solving skills by recognising proofing faults and determining adjustments to correct them
- Use of technology by using monitoring equipment and interpreting readouts

Required knowledge:
The following knowledge must be assessed as part of this unit:

Interpreting job specifications
- What would you do if vital information was missing from the job ticket?
- What checks should be undertaken prior to set up (availability of materials etc.)?

Relief plates
- What would be the effect of plates with poor relief?
- Why is the calliper of the mounting material important?
- How is the position of the plate on the mount determined?
- What techniques could be used to ensure the edges of the plate do not lift?

Reel in-feed
- What are the major OHS concerns when setting up the reel in-feed?
- How do you determine the printing side of the material?
- What would be the effect of low web tension on the print?
- What other types of web splices could be used appropriately for the job?

Sheet in-feed
- What are the major OHS concerns when setting up the sheet in-feed?
- How is the sheet position determined for the job?
- What effect does side lay selection have on the job?
- How would the appropriate front lays be selected?
- How would a register check be carried out?
- Why is a two-sheet cut used on most feeders?
- How does the machine know if a sheet is missing or late?

Reel delivery system
- What would be the effect of excessive web tension at the rewind of the machine?
- Name THREE risks associated with the rewind of the machine.
Sheet delivery system

- Why is the application of spray powder sometimes advisable?
- What are the effects of too much spray powder?
- Why may slowdown devices be used in the delivery?
- What effect would excessive jogging have on the stack?

Preparation of inks and additives

- What are the main environmental and OHS concerns about inks and additives?
- How was the suitability of ink matched to the particular job?
- What would happen if the ink were too tacky?
- How would ink that was slightly light be modified to meet the needs of the job?
- What methods are available to check the ink for correct colour?
- Who passes the colour prior to running the job?

Machine set up

- What are the major OHS concerns when setting up the machine?
- How were the specifications determined, relating to the specific job?
- What effects may incorrectly set inking rollers have on the print?
- Why may the ink profile vary across the machine?
- What is the optimum ink duct sweep?

Basic in-line processes

- What precautions should be taken if UV drying was utilised to dry the ink film?
- What steps should be taken to incorporate the in-line processes into the make ready?
- How can the equipment used in in-line processing be protected against damage during set up?

Proofing and adjustment

- What methods can be used to minimise waste during make ready?
- What procedures are adopted to have the print approved?
- What quality control measurements were applied to the print to test against known standards?
- What do you check on the initial print prior to running?
- How are the settings to be adjusted determined?
- What process is used to plot the success of the machine adjustment?
- How are the final results recorded for future reference?

Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
- Range of standard inks commonly used in 1-2 colour printing

Colour matching systems
- Use of visual colour assessment and densitometry to match basic standard colours under controlled lighting conditions

Machines
- A range of platen, cylinder and rotary printing machines with manual, semi-automated, fully automated or computerised process control

Design
- 1-2 colours, simple graphics and text. Minor variation in registration and position

In-line processes
- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g., flat-bed cutting, folding) it should be assessed as such

Substrate types
- Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal

Substrate handling
- Wide or narrow reel or large or small sheet handling systems

Degree of autonomy
- Working to defined procedures under limited supervision

Routine
- Routine within this context relates to the set up and production of print runs. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Set up reel- or sheet-fed platen, cylinder or rotary printing machines for routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Demonstrate all safety devices on the machine
- Set up for TWO basic relief printing jobs (if possible including at least ONE in-line process) according to manufacturer's specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- reel- or sheet-fed platen, cylinder or rotary printing machine

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPSU201B Prepare, load and unload reels and cores on and off machine
- ICPSU202B Prepare, load and unload product on and off machine
- ICPSU207B Prepare machine for operation (basic)
- ICPSU211B Prepare ink and additives
- ICPPR252B Produce basic relief printed product
ICPPR352B Produce complex relief printed product

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to produce complex relief printed product.

Employability Skills

This unit contains employability skills.

Application of the Unit

This unit requires the individual to operate a platen, cylinder or rotary printing machine ensuring an efficient non-routine production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector

Printing

ELEMENT PERFORMANCE CRITERIA

1. Maintain non-routine operation of reel system (OR Element 2)

   1.1 Reel stand and rewind section are monitored and adjusted to maintain correct tension and to ensure no marks, blemishes or damage to finished product and to ensure efficient continuous operation

   1.2 Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation

   1.3 Substrate is added to and removed from the process according to job instructions

   1.4 Sheeting section is monitored and adjusted to ensure quality and efficient product delivery

   1.5 Set-off / marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof

2. Maintain operation of sheet system (OR Element 1)

   2.1 Feeder and delivery is monitored and adjusted to ensure continuous and efficient feeding to machine

   2.2 Sheet pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operation

   2.3 Transfer systems are monitored and adjusted to ensure correct and continuous sheet handling and efficient operation

   2.4 Set-off / marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof

   2.5 Substrate is added to and removed from process according to job instructions
<table>
<thead>
<tr>
<th></th>
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<th>3. Maintain complex relief printing process</th>
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<tbody>
<tr>
<td></td>
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<td>3.1 Relief polymer forme or plate cylinder condition is monitored and adjusted to ensure the quality of printed product meets the standard of the sample sheet</td>
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<td>3.2 Relief polymer impression surface condition is monitored and adjusted to ensure the quality of printed product meets the standard of sample sheet</td>
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<td>3.3 Relief polymer inking system is monitored and adjusted to ensure quality of printed product meets the standard of sample sheet</td>
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<td>3.4 Drying systems are monitored and adjusted to ensure quality of printed product meets the standard of approved proof</td>
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<td>4. Maintain production process</td>
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<tr>
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<td></td>
<td>4.1 Production process is operated in association with fellow workers and according to company specifications and planned daily schedule</td>
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<td>4.2 If required, in-line printing / converting / binding / finishing processes are monitored and adjusted to ensure quality of product meets the standard of the approved proof</td>
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<td>4.3 Production is maintained within OHS requirements and company and manufacturer's specifications</td>
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<td>4.10 Waste is sorted according to enterprise procedures</td>
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<td></td>
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<td>5.4 Relief machine operation is checked to ensure correct operation</td>
</tr>
</tbody>
</table>
6. Conduct shutdown of production process

6.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures

6.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

6.3 Unused ink is correctly labelled and stored according to manufacturer / supplier specifications and enterprise procedures

6.4 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

6.5 All product is removed from operating area

6.6 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures

6.7 Repair / adjustment is verified prior to resumption of operations

7. Clean and wash up printing machine at end of print run

7.1 Cylinders, plate and roller surfaces are cleaned ready for next run

7.2 Inking system is washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements

7.3 In-line printing / converting / binding / finishing units are cleaned ready for next run

7.4 Reel feed, transportation and delivery systems are disengaged and cleaned ready for next run

7.5 Sheet feed, transport and delivery systems are disengaged and cleaned ready for next run

7.6 Production records or other documentation are accurately completed where required by enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting the job brief and providing advice to clients about options and limitations
- Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when maintaining the production process in association with others
- Mathematical ideas and techniques by calculating substrate requirements, plate position and pressures
- Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
- Use of technology by using monitoring equipment and computerised production records

Required knowledge:

The following knowledge must be assessed as part of this unit:

Reel transportation and web control

- What are the major OHS concerns when setting up the reel transportation system?
- What could cause the reel to wander?
- What could cause the web to break at the unwind unit?
- What print fault would result from the reel being run out of centre?
- What possible faults in the unwind section could cause a web break?

Sheet transportation and transfer at the feeder

- What are the major OHS concerns when setting up the sheet transportation system?
- What would be result of worn suckers at the feeder suction head?
- What type of two-sheet detection is on this machine?
- How much movement should the sheet have when being registered by the side lay?
- What could cause mis-register of the sheet at the feeder?
- What are the visible signs of the sheet being registered in the feeder?
- How can gripper malfunction effect sheet control and transfer?
- When would sheet transfer mechanisms require adjusting?
- What would cause the feeder stack to become uneven?
- What would be the result of the feeder stack not being loaded level?
- How can any unevenness of the feeder stack be rectified?

Reel delivery for rewinding and sheeting

- What are the OHS risks associated with rewinding and sheeting?
- What safety feature is in the delivery system if the web jams up?
- Why would the sheet cut-off wander?
- What is the effect of poorly adjusted nip rollers when rewinding and sheeting?

Sheet delivery
• What effect will machine speed have on sheet delivery?
• What is the advantage of spraying moving sheets with anti set off powder in the delivery?
• What items in the delivery could cause marking of the printed image?
• What remedial steps may be necessary to eliminate marking of the printed image?
• What faults could result from incorrectly set grippers in the transfer section of a machine?
• What devices were adjusted to maintain sheet control in the delivery?

Printing unit
• What could be the result if the plate lifts at the grip edge during a print run?
• How could a build-up of ink on the impression cylinder affect the printed product?
• What could cause the ink to lie back in the duct?
• How could the problem of paper surface picking be rectified?
• What could cause diminished impression during the print run?
• What could cause the plate surface to prematurely wear during production?

Drying unit
• Why is it not advisable to eat or drink near the machine when using UV inks?
• What is the link between driers and set off and marking?
• What causes UV ink to dry?
• What could cause the substrate to blister?
• What is the effect of incorrect drying temperature on the finished product?

In-line processes
• What are the major OHS concerns when operating cutting devices?
• How was the consistency of the cutting and creasing unit checked?
• What would be the result of excessive pressure on the slitters?
• What is the benefit of die cutting using a rotary die?
• What are the advantages of using a perforation wheel to perforate?

Maintaining production process
• What is the effect of inadequate communication within the work team on a relief printing machine?
• What safety features within the organisation aid in maintaining effective production?
• What are the ramifications if machine guards are removed and / or micro switches are disconnected on a machine?
• Who would be held legally responsible for the removal of machine guards and / or disconnection of micro switches?
• What other measurement besides optimum solid ink density can be measured to assess print quality?
• What is the most accurate method of checking register during a production run?
• Why is it necessary to take immediate action when production problems are anticipated?
• What action is taken to eliminate further processing of unacceptable printed product?
• How will a stack of paper be affected if the relative humidity is increased in the press room?
• What is the procedure to care for a newly delivered skid of paper to the press room?
• Why should waste be sorted?
• What is the advantage of keeping reusable waste?

Client liaison
• What industry standards can be applied to enhance effective communication with the
client?
• What are the necessary procedures that the client should follow to "OK" a printed product?

Relief printing machine operating problems
• When would it be necessary to call service personnel to correct a machine problem?
• What enterprise procedures are in place to report any machine operating problems?

Shutdown procedures
• What would be the result if correct shutdown procedures were not followed?
• Why is it necessary that correct shutdown procedures be conducted with fellow workers?
• What advantages result from proper labelling and storage of excess inks and materials?
• Why should the printed product be clearly labelled prior to removal from the press room?

Cleaning and washing up the printing unit
• What OHS concerns should be observed when handling ink?
• What safety precautions should be observed when cleaning the printing cylinders?
• Why is it necessary to thoroughly clean and wash up the printing unit prior to the next print run?
• How can plates be stored so as to minimise damage?

Cleaning feed, transportation, delivery and in-line sections
• What are the OHS precautions to be observed when cleaning these sections of the machine?
• Why is it necessary to maintain a clean substrate handling section of the machine?

Completing production records
• How are completed records used in the final analysis of the job?
• What are the benefits of comprehensive records when considering the production of future jobs?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
• Range of inks commonly used in 3 or more colour printing, including standard and special colours
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Colour matching systems</td>
<td>• Use of densitometers and spectrophotometry</td>
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<tr>
<td>Machines</td>
<td>• Range of platen, cylinder and rotary machines with manual, semi-automated, fully automated or computerised process control</td>
</tr>
<tr>
<td>Design</td>
<td>• 3 or more colours, complex graphics and text. Critical &quot;tight&quot; registration, fit and position, registration should be at least that required for four-colour process work</td>
</tr>
<tr>
<td>In-line processes</td>
<td>• Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such</td>
</tr>
<tr>
<td>Substrate types</td>
<td>• Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal</td>
</tr>
<tr>
<td>Substrate handling</td>
<td>• Wide and narrow reel, and large and small sheet handling systems</td>
</tr>
<tr>
<td>Degree of autonomy</td>
<td>• Working independently in consultation with others</td>
</tr>
<tr>
<td>Non-routine</td>
<td>• Non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally</td>
</tr>
</tbody>
</table>
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Operate a platen, cylinder or rotary printing machine ensuring an efficient non-routine production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Monitor production output and make necessary adjustments to maintain print quality on a relief printing machine whilst producing a complex print on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to job specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- platen, cylinder or rotary printing machine

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR451B Set up for complex relief printing
ICPPR382B Produce and manage complex digital print

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce and manage digital print for a complex print production environment.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to identify the productivity of digital print systems and to communicate these effectively. The individual is required to troubleshoot and rectify production workflow problems for digital printing to maximise productivity. The individual will construct and access complex electronic data, perform digital colour management, manage digital production workflows, and maintain and adjust machine settings to ensure production speeds and print quality are achieved.

This competency is best applied in the commercial print, pre-press, bureau, high-end digital print or a combination of any of these business environments.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Troubleshoot and correct production workflows for digital printing

   1.1 A productivity analysis on a digital production system is undertaken to determine most productive approach according to job specifications

   1.2 Workflow procedures for digital printing are developed according to equipment availability and production environment, for a range of job specifications

   1.3 Possible causes for problems in the workflow procedures are identified and rectified and strategies to improve productivity with minimum waste in resources and according to job specifications are developed

   1.4 Preventive maintenance on a digital printing system is undertaken according to manufacturer's specifications to ensure maximum productivity, minimum downtime and wastage

2. Liaise with clients

   2.1 Print services, quality expectations and print costings for digital printing are communicate to clients according to enterprise procedures

   2.2 Productivity advantages and disadvantages of different digital print options are communicated according to manufacturer's specifications and enterprise procedures

   2.3 Turnaround time is calculated and communicated to client according to enterprise procedures
3. Confirm job specifications

3.1 Print job specifications are correctly interpreted from job documentation or production control system
3.2 Availability of all job components is checked according to enterprise procedures
3.3 Scanning, proofing and finishing requirements of job are checked and internal workflow and / or outsource arrangements are coordinated
3.4 Run time of job is determined and completion time correctly estimated

4. Access, verify and submit electronic data files to a digital printer

4.1 A workstation computer and industry software are used to locate and retrieve electronic data files according to job specifications
4.2 Preview or pre-flight check is performed on electronic data files to verify correct job set up according to job specifications
4.3 Job priority is determined according to job specifications and production schedules
4.4 Data file is submitted to print and image quality and machine productivity checks are performed and adjustments made to correct any problems

5. Perform complex digital colour management

5.1 Appropriate digital colour management solutions are used to minimise variation in colour selection, lighting conditions and surrounding colour, machine calibration, screen angle, machine resolution, conversion algorithms from RGB to CMYK, substrate type and condition
5.2 Printed RGB, CMYK and PMS colour charts are used to perform colour matching with client proof
5.3 Accurate recommendations on colours to use when producing electronic data files are made according to job specifications
5.4 Colour matching of an electronic data file created using the RGB colour model is performed by using machine calibration procedures and by customising an output profile

6. Perform and / or coordinate document proofing

6.1 A digital proof run is conducted for client approval and to confirm proof meets job specifications
6.2 Internal or external pre-press proofing systems operators are consulted to conduct the proof run and provide job specifications according to enterprise procedures
6.3 Communication between the client and proofing provider occurs to ensure proof conforms to job specifications

7. Run digital print job and / or coordinate press print run

7.1 Production schedules, enterprise procedures and job specifications are observed and liaison with internal and / or external production operators is maintained to determine start and duration time for the print run
7.2 A digital print run is conducted according to job specifications ensuring that machine productivity and quality are monitored and adjusted throughout the duration of the print job
8. Perform and/or coordinate document finishing and client delivery

8.1 The finishing method is determined according to job specifications

8.2 Steps required for document finishing are identified and if necessary performed on in-line finishing units on a web- or a sheet-fed system according to enterprise procedures

8.3 Packaging and presentation of finished print work is completed with co-workers and/or external source, if necessary, to ensure against damage and to conform to delivery requirements according to job specifications
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by providing information to client on how to construct digital files to achieve accurate print results
- Collecting, analysing and organising information by determining printing conditions to identify colour management requirements
- Planning and organising activities by designing production workflows to ensure efficient print processes
- Teamwork when maintaining production workflows in association with co-workers
- Mathematical ideas and techniques by using calibration techniques to determine dot densities
- Problem-solving skills by identifying workflow problems and implementing strategies to improve productivity
- Use of technology by using proficiently computer hardware and software to maximise productivity

Required knowledge:
The following knowledge must be assessed as part of this unit:

Troubleshooting and problem solving
- What problem-solving strategies could you use if a key piece of equipment in the production workflow was temporarily unavailable?
- What would you do if the substrate type you required was unavailable?
- What workarounds could you use if you received a data file error when accessing a PDF file?
- What would you do if you had a busy production schedule with tight deadlines and a power failure occurred for an indefinite period of time?

Analyse and recommend printing solutions
- What are the factors that influence making a decision about using a particular printing solution (run length, substrate type, application)?
- What would be the cost difference between a specified job printed on a digital system and a specified traditional system (eg digital vs lithographic)?
- What would be the quality difference between a specified job printed on a digital system and a specified traditional system (eg digital vs lithographic)?
- What would be the difference in turnaround time of a specified job printed on a digital system and a specified traditional system (eg digital vs lithographic)?
- Which print method would be the most appropriate option for the specified print job?

Communication and client interaction
- What measures can be taken to ensure clients have correct procedures for providing electronic files?
- How would you explain the main differences between digital printing and traditional printing methods?
- What recommendations could you make to a client who has created an electronic file in an incompatible software application?
- What suggestions could you make to a client who required a high volume print run but
needed a portion of the print job immediately?
  • What steps would need to be followed for a client approval of a proof?

Job requirements and processing systems
  • What would you do if vital information was missing from the job ticket (manual or electronic)?
  • What checks were undertaken prior to set up (availability of material, maintenance)?
  • If a file does not transfer correctly what action should be taken to correct the problem?
  • What are the main points to be checked before submitting file to print?

Data access and manipulation
  • What checks are made to ensure the data is in a format that can be used in digital print?
  • What suggestions could you make to a client who has an incompatible version of software?
  • What are the ways to submit a PDF file to the digital printer?
  • What would you do if you could not access an electronic data file using industry software?

Digital image scanning
  • In what situation would you digitally scan a document rather than create an electronic file?
  • What is OCR scanning?
  • How does scan resolution affect document size and quality?
  • What could you do if a scanned image was too dark?
  • What sort of scanner hardware and software configuration could be used to digitally scan a hard copy multi-page document with text and images?

Digital colour management
  • What is the difference between colours displayed on a computer monitor and printed colour?
  • How does machine calibration affect colour consistency?
  • How do you use printed colour charts to perform colour matching to a proof?
  • What does the acronym ICC stand for and what is the significance?
  • How does a simulation profile affect colour output?

Proofing and adjustment
  • Under what circumstances would a job be modified before printing?
  • Why would margins be changed when the job reaches the printer?
  • What steps would need to be followed for client approval of the print?
  • What is the proof checked against?
  • What type of proofing system is available in the traditional pre-press?
  • What recommendations could you make regarding an appropriate proofing system for a specified print job?

Document finishing and client delivery
  • What are the various types of binding?
  • What procedures would you follow if the binding method required by the client was not available at your site?
  • What options could you suggest if the document size was too thick to staple?
  • Why is packaging finished print work important?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inking systems | • Range of inks, dyes, toners commonly used in 2-colour printing, including special colours

Colour matching systems | • Use of visual colour assessment and matching under controlled lighting conditions

Machines | • Range of non-impact printing machines including inkjet and laser with or without colour manipulation capability, and including machines with computerised monitoring and/or control

Design | • 1-2 colour, simple graphics and text. Minor variation in registration position

In-line processes | • Minor in-line processes such as perforating, numbering, date coding, imposition, that do not constitute another defined unit of competency. Major in-line process is defined as a separate competency eg flat-bed cutting, folding

Substrates | • Range of print media and paper

Degree of autonomy | • Working to defined procedures under limited supervision

Manufacturer's specifications | • Technical, administrator and user specifications documented by a manufacturer for a range of printing machines

User replaceable consumables | • Consumables required to be changed by an individual if damaged or reached expiry. Used by a range of printing machines for correct functioning such as ink, toner, developer, waste toner, cleaning web, fuser, substrates

User control interface | • Computerised monitoring and data entry device used to enter machine default settings, job specification settings, monitor machine status and perform machine productivity enhancements
Performance expectations

• Manufacturer's documented statement of print machine productivity and quality capabilities and limitations eg substrate feed and speeds, substrate recommendations, substrate weight and size capabilities, productivity and performance issues associated with a variety of print jobs

Registration mechanisms

• Mechanical and / or electronic controls used to adjust substrate position throughout substrate feeding and transport units of a range of printing machines

Calibration

• Mechanical and / or electronic and / or visual controls used to identify and correct ink coverage and density inconsistencies in a range of printing equipment

Enterprise procedures

• May include rules, standards, OHS guidelines, communication protocols and behaviour codes of a range of workplace environments

Workstation computer

• Personal computer with either proprietary or non-proprietary operating systems used to create, access and edit electronic data files from a range of manufacturers eg Apple, IBM, UNIX

Industry software

• Range of software to design, create, access, edit and print electronic data files from a range of manufacturers eg Adobe, Quark Inc., Macromedia, Microsoft

Electronic data files

• Range of proprietary or non-proprietary data file formats compatible with a range of workstation computers and industry software

Digital front-end

• Proprietary computer processor hardware and software required to interpret electronic data files and convert to print-ready data

Pre-flight

• User software designed to check, preview and edit to ensure data file integrity for a range of operating systems and printing machines

Workflow

• Task breakdown of the print production cycle for a range of electronic data files, computer systems, digital front ends, industry software, workplace regulations and printing machines
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Organisation skills to coordinate pre-press, print run, finishing and delivery production workflows
- Produce and access complex electronic data
- Conduct a digital proof run
- Perform digital colour management
- Adjust settings and ensure productivity
- Perform preventive maintenance on digital printer
- Demonstrate use of computerised control and monitoring systems if available and appropriate
- Perform preventive maintenance tasks on a digital printer according to manufacturer's specifications
- Prepare a written document that outlines production workflow and give reasons for production methods selected for a print job using the following job specifications within a specified production environment for:
  - 4-colour advertising brochure
  - Quantity: 2000
  - Substrate: 120gsm coated
  - Text: supplied electronically
  - Images: continuous tone photographs supplied
  - Logos and line art: supplied electronically
  - Layout: hand drawn thumbnails supplied
  - Finished size: A3 bleed
  - Finishing: guillotined, folded and saddle
  - Packaging: boxed
  - Turnaround time: 100 in 48 hours and remainder in 14 days
  - Produce a digital colour proof of a supplied electronic file
  - Use a digital colour management system to perform colour matching to a supplied proof
  - For valid and reliable assessment of this unit, evidence should be gathered over a period of time through a range of methods for assessment to indicate consistent performance
  - Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- a digital printing machine and a digital front end
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR281B Set up and produce basic digital print
- ICPPR282B Produce and manage basic digital print
- ICPPR481B Set up and produce complex digital print
**ICPPR383B Prepare for personalised digital printing**

**Unit Descriptor**
This unit describes the performance outcomes, skills and knowledge required to set up a digital printing press for personalised data printing.

**Employability Skills**
This unit contains employability skills.

**Application of the Unit**
This unit requires the individual to produce personalised digital print runs that involve setting the data files and ensuring the correct sequence.

**Unit Sector**
Printing

### ELEMENT PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Identify the job specifications | 1.1 All details required for the job are checked and confirmed against job specifications  
1.2 The correct materials are checked and are available for the job  
1.3 Printing equipment is checked that it is operating efficiently and safely  
1.4 Post-printing requirements are accurately identified according to job specifications  
1.5 The correct data files are accessed and data conforms to the job specifications |
| 2. Set data requirements | 2.1 Data files are set up and required dynamic links operate correctly and settings conform to the job specifications  
2.2 Data is in the correct sequence required for the run  
2.3 Data is checked to ensure it is uncorrupted |
| 3. Set machine quality | 3.1 Work area is safe and ready for production  
3.2 The digital printing machine is set to run efficiently and safely  
3.3 The image is complete, sharp, of the required strength, free from contamination and in register  
3.4 Output can be achieved at the required quality standard and at the required speed  
3.5 A sample from the machine is produced and checked for conformance to the job specifications  
3.6 Adjustments are made when specifications are not met  
3.7 If adjustments involve changes to materials, costs or time, supervisor or client are informed and approval secured  
3.8 Set up is complete before the deadline for the start of production |
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by placing data in the correct sequence required for the run
- Collecting, analysing and organising information by identifying the requirements of the job
- Planning and organising activities by correctly identifying post-printing requirements
- Teamwork when maintaining the production process in association with others
- Mathematical ideas and techniques by checking data, where relevant, to ensure it is uncorrupted
- Problem-solving skills by making adjustments to the machine when production standards are not met
- Use of technology by setting up a digital printing press for variable data printing

Required knowledge:
The following knowledge must be assessed as part of this unit:

- Job requirements
- Information sources
- Workflow
- Printing machines
- Result prediction
- Data interpretation
- Data interpretation
- Data retrieval

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Correct materials
- Glues, papers, coated and uncoated, pre-printed

Job specifications
- Job sheets, batch processing orders, job specs

Personalised
- Involves the recipient's name and / address at least once

Printing machine
- Production speeds, at least 30 duplex pages per minute, and quality of at least 600 dpi
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Manage and adjust the digital data to conform to print requirements prior to digital printing and produce personalised digital print runs that involve setting the data files and ensuring the correct sequence.
- For valid and reliable assessment of this unit, evidence should be gathered over a period of time through a range of methods for assessment to indicate consistent performance.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
- digital printer

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.
ICPPR411B Mount and demount flexographic plates for complex printing

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to mount and demount flexographic plates for non-routine printing.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to prepare and mount flexographic plates and plate cylinders for complex printing. Plates and cylinders are checked for registration.

Unit Sector
Printing

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Confirm non-routine job specifications | 1.1 Job requirements are read and interpreted from job documentation or production control system  
1.2 Set up is planned and carried out correctly in minimum time with minimum wastage  
1.3 Prior inspections are completed and signed off |
| 2. Prepare flexographic plates | 2.1 Plate height is measured according to non-routine job specifications  
2.2 Plates are trimmed and prepared according to mounting system requirements  
2.3 Mounting adhesive is selected to achieve correct PCD (Pitch Circle Diameter) of specified plate cylinders and gears |
| 3. Prepare plate cylinder | 3.1 Plate cylinders / seamless sleeves are selected, cleaned and prepared and correct gears are mounted OR  
3.2 Sleeves and correct gears on mandrels are selected, cleaned, prepared and mounted to meet non-routine job specifications  
3.3 TIR (Total Indicated Runout) is checked to be within specified tolerances on plate cylinders  
3.4 Selected mounting adhesive is applied to plate cylinders |
<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>4.</td>
<td>Mount and demount flexographic plates on mounting / proofing machine</td>
</tr>
<tr>
<td>4.1</td>
<td>Plates are prepared and mounted on cylinders using pin mounts or microdot systems or sleeves according to chart number / print direction OR</td>
</tr>
<tr>
<td>4.2</td>
<td>Plate mounting sheet is prepared to meet non-routine job specifications AND</td>
</tr>
<tr>
<td>4.3</td>
<td>Plates are mounted to position on plate mounting sheet or camera targets AND</td>
</tr>
<tr>
<td>4.4</td>
<td>Plate mounting sheet is installed and tensioned onto plate cylinder to specified chart number / print direction</td>
</tr>
<tr>
<td>4.5</td>
<td>Correct cleaning solution and brush are used to clean plate</td>
</tr>
<tr>
<td>4.6</td>
<td>Correct tools are used to demount plate without damaging plate</td>
</tr>
<tr>
<td>4.7</td>
<td>Plate is visually checked for damage</td>
</tr>
<tr>
<td>4.8</td>
<td>Plate is prepared for storage and then stored correctly according to enterprise procedures</td>
</tr>
</tbody>
</table>
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by interpreting job brief and advising client (internal or external) about options and limitations
• Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for job
• Planning and organising activities by providing information about time and materials requirements for production scheduling
• Teamwork when cooperating with other workers and coordinating production unit to ensure efficient operation
• Mathematical ideas and techniques by calculating plate position and pressures
• Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
• Use of technology by using monitoring equipment and computerised production records

Required knowledge:

The following knowledge must be assessed as part of this unit:

Interpreting job specifications

• Why is it necessary to ensure that the job specifications are read and properly understood?
• What production problems could eventuate by not reading and understanding the job specifications?
• With whom would you discuss any production problems?

Mounting and demounting flexographic plates

• What OHS concerns are there when mounting and demounting plates?
• What is the most common cause of photopolymer plates crazing on the image side?
• Why is resiliency of the printing plate important?
• What is the main advantage of using thin photopolymer plates in process printing?
• What faults may be detected on new plates?
• What type of solvents should be used on photopolymer plates?
• What are the benefits of optical mounting?
• What is the purpose of binding plates after mounting?
• What possible print faults could be eliminated by using cushion mount?
• What is the result of air being trapped under plates?
• How do you select the correct cushion mount for a particular job?

Problem solving

• How do you eliminate low spots?
• What can be done to minimise press bounce in jobs that are mounted more than one across?
• What are some possible causes of print slur?
• How can you prevent or minimise plates lifting?
• What can you place on the plates to make registering the job easier on the press?
Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?
- What other sources of information are available?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
- Range of inks commonly used in 3 or more colour printing, including standard and special colours

Colour matching systems
- Use of viscosity controls, densitometers and spectrophotometry

Types of plates
- Range of plate types and thicknesses used in flexographic printing

Machines
- Range of stack, in-line and central impression flexographic printing machines with manual, semi-automated or fully automated process control

Design
- 4 or more colours, complex graphics and text. Critical "tight" registration, fit and position, registration should be at least that required for four-colour process work

Jobs
- Surface and reverse (lamination) prints

Degree of autonomy
- Working independently in consultation with others

Non-routine
- Non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally

Tape
- Tape characteristics, densities
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Prepare and mount flexographic plates and plate cylinders for complex printing. Plates meet the job specifications and registration is checked if necessary
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Mount and demount plates and install in a flexographic printing machine for a variety of different complex print jobs on TWO occasions according to job specifications and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- 4 or more colour flexographic press

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR413B Set up for complex flexographic printing
- ICPPR414B Produce complex flexographic printed product
ICPPR413B Set up for complex flexographic printing

**Unit Descriptor**

This unit describes the performance outcomes, skills and knowledge required to set up machines for non-routine flexographic printing.

**Employability Skills**

This unit contains employability skills.

**Application of the Unit**

This unit requires the individual to set up flexographic printing machines either wide or narrow web. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.

Mounting and demounting plates is covered in ICPPR411B Mount and demount flexographic plates for complex printing.

**Unit Sector**

Printing

### ELEMENT PERFORMANCE CRITERIA

1. **Confirm non-routine job specifications**
   1.1 Job requirements are read and interpreted from job documentation or production control system
   1.2 Set up is planned and carried out correctly in minimum time with minimum wastage
   1.3 Availability of all job related components is checked
   1.4 Proofed job is checked for conformance with job specifications

2. **Set up reel transportation and delivery system on web-fed machine**
   2.1 Reels are checked for treatment levels, coatings and printing side and age of product
   2.2 Unwind reels are secured on reel shaft
   2.3 Reels are correctly positioned on unwind stand
   2.4 Press is webbed for surface or reverse or perfecting printing according to non-routine job specifications
   2.5 Edge guide is centred and set to non-routine job specifications
   2.6 Unwind tension is set to suit substrate
   2.7 Rewind tension is set to suit substrate
   2.8 Nip rollers are set according to non-routine job specifications
   2.9 PIV (Positively Infinitely Variable) drive is set for appropriate tensioning of substrate
3. Select and prepare inks and solvents

3.1 Inks and solvents are selected according to job specifications and end-user requirements

3.2 Quality and suitability of inks and solvents are checked and appropriate action is taken

3.3 Inks and solvents are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste

3.4 Correct colour and weight / volume of ink are mixed and viscosities checked and modified according to the press requirements and non-routine job specifications

3.5 Ink formula and approved colour draw downs are appropriately recorded

3.6 Inks and solvents are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions and the relevant hazardous liquids storage regulations

4. Set up machine for complex flexographic printing

4.1 Flexographic plate cylinders are installed and register adjustments centred OR

4.2 Sleeves are installed in press and register adjustments made OR

4.3 Plate mounting sheets are mounted on cylinders in press and register adjustments made

4.4 Plate cylinders are gauged up or pre-set to impression

4.5 Anilox rollers are selected to suit individual colour and plate reproduction requirements for each unit

4.6 Appropriate ink metering system is selected for each unit

4.7 Inking system is set up and roller nips / blades are set correctly

4.8 Ink circulation is maintained at correct level and flow for machine

4.9 Viscosities are adjusted according to job specifications

4.10 Air volume and drier temperatures curing units are selected to suit inks, substrate, solvents and according to job specifications

4.11 Air volume is adjusted between colours to maximise drying and minimise air overspill

5. Set up in-line units for basic process(es)

5.1 Minor in-line printing / converting / binding units are set up for basic process(es) and adjusted according to machine requirements and job specifications

5.2 Assistance is given in set up of major in-line printing / converting / binding units

6. Conduct proof run

6.1 Material to be used for proof is organised correctly

6.2 Press is set up and operated according to OHS guidelines

6.3 Print impressions are set to minimum kiss impression

6.4 Web tensions are correctly set at unwind, between stations and rewind

6.5 The print is checked for register

6.6 Drying is checked as sufficient to key ink to the substrate

6.7 The viscosities are adjusted to obtain the correct colour at proof speed and checked against colour matching system

6.8 The substrate is checked against job specifications
7. Organise proof inspection and / or testing
   7.1 Proof is visually inspected and / or tested or laboratory testing is organised according to enterprise procedures
   7.2 Production does not commence without client approval or authority where appropriate

8. Readjust settings to production speed
   8.1 Production speed print results are interpreted and appropriate adjustments are made to press, ink and substrate settings
   8.2 Adjustments are made according to product specifications and press performance
   8.3 Web is spliced at production speed and further samples are obtained for quality inspections at appropriate intervals
   8.4 Press settings are documented and samples are retained
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

**Required skills:**
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting the job brief and advising the client (internal or external) about options and limitations
- Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when cooperating with other workers and coordinating the production unit to ensure efficient operation
- Mathematical ideas and techniques by calculating substrate requirements and pressures
- Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
- Use of technology by using monitoring equipment and computerised production records

**Required knowledge:**
The following knowledge must be assessed as part of this unit:

**Interpreting complex job specifications**
- Why is it necessary to ensure that the job specifications are read and properly understood?
- What production problems could eventuate by not reading and understanding the job specifications?
- With whom would you discuss any production problems?

**Mounting and proofing flexographic plates**
- What OHS factors need to be considered when mounting and proofing flexographic plates?
- What is the most common cause of photopolymer plates crazing on the image side?
- Why is resiliency of the printing plate important?
- What is the main advantage of using thin photopolymer plates in process printing?
- What faults may be detected on new plates?
- What type of solvents should be used on photopolymer plates?
- What are the benefits of optical mounting?
- What is the purpose of binding plates after mounting?
- What possible print faults could be eliminated by using cushion mount?

**Installation of printing cylinders or sleeves**
- What OHS factors need to be considered when installing printing cylinders or sleeves?
- What precautions should be taken to ensure that the plates and cylinders or sleeves are not damaged during installation?
- What needs to be checked to ensure plates and cylinders or sleeves have been installed correctly?

**Reel transportation system**
• What OHS precautions must be observed when webbing up the machine?
• How do you determine the position of the reel?
• How is the substrate pulled into the machine?
• What is the result of insufficient unwind tension?
• What is the result of excessive unwind tension?
• What is the function of the "Dancer" roller on a web machine?
• What is the function of the PIV unit?
• What is the result of adjustments to the PIV?
• What is the function of the lay-on roller?
• What will be the effect of excessive lay-on roller pressure?
• What can happen if the web is not spliced correctly?
• How does the particular web viewing device work?

Delivery system
• What OHS precautions must be observed when setting up the delivery?
• How is the web controlled in the rewind unit?
• What is the result of incorrect rewind tension?
• What remedial steps can be taken if there is a possibility of the ink marking in the rewind?
• What function does the use of air blast play in the delivery of sheets?

Preparing inks and additives
• What OHS precautions must be observed when preparing inks and additives?
• What details are necessary to check an ink's suitability for the printing process?
• What special end-use requirements may be necessary?
• What is the main function of a pigmented extender used in flexographic printing?
• Why are plasticisers added to flexographic inks?
• Why are other additives used in flexographic inks?
• What is the range in seconds for zahn cup measurements?
• What effect does foaming have in a zahn cup when measuring the ink viscosity?
• What is the recommended pH range when printing with aqueous inks?
• What precautions do you observe to minimise waste when preparing the ink?
• What is the shelf life of most inks?
• What conditions are relevant to the storage of inks and additives?
• What conventions should be adhered to when labelling mixed inks?

Complex machine set up
• What OHS factors need to be considered when setting up the machine?
• What is the advantage of centring all machine controls?
• What checks should be made on cylinders and gears?
• What checks should be performed prior to cylinder or sleeve installation?
• What angle should the chamber blades be set?
• What is the main advantage of gauging up and dry register prior to printing a job?
• What cell count of the anilox roller is used when printing solids?
• Why should water treatment additives be used in a central impression drum and chill roller coolant system?
• What are the advantages of laser engraved ceramic anilox rollers?
• What are THREE things relating to the anilox roller that a roller scope will measure?
• What could be the reasons for anilox wear?
• What type of job would be printed using a hexagonal cell configuration?
• What is the recommended web temperature when printing polypropylene film?
• What method of drying is used when printing on polythene by the flexographic process?
What factors affect the drying rate of liquid inks?
- What factors affect the drying of aqueous inks?
- What is the operating range of UV lamps?

**In-line processes**
- What OHS precaution must be observed when slitting on the machine?
- How is a cold seal formed?
- What are the reasons for a printed product to be punched?
- What do you need to consider when setting hole punching in relation to repeat length?
- What would be the result of excessive pressure on the slitters?

**Problem solving proofing and adjustment**
- Why is it necessary to graduate the drying speeds of each progressive colour, so that first-down colours dry faster the subsequent colours?
- Why is it that in flexographic printing as the press speed increases so does the colour strength?
- What could cause a decrease in web tension?
- What could be the result of increasing rewind tension after the roll has been partially rewound?
- What would be the major cause of a telescopic roll?
- What print characteristics are related to excessive printing pressure?
- What causes picking when printing multicoloured work?
- What print faults result from using an over-reduced ink?
- What problems can cause lateral streaks showing up in uneven printing?
- What are the causes of moire patterns when printing by the flexographic process?
- What is the result of air being trapped under mounted plates?
- What is the instrument used to identify retained solvent trapped in the print?
- What is the purpose of taking Dyne readings?
- What is the purpose of the crinkle test when testing an ink?
- What would be the result if an excessive final drying temperature was used when printing polypropylene film?
- What property of ink can be adjusted to reduce dot gain?
- When checking the viscosity for ink whilst using ink pumps, why should the ink returning from the ink fountain not be used?
- What problems result from the excessive use of slow solvents?
- How does the "yield value" of ink affect the ink transfer of halftone dots?
- Why do laminating inks once printed appear dull and easy to scratch?
- What will be the result of excessive print area tension?
- What are some of the problems that the printer may associate with cold seals?

**Information sources**
- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?
- What other sources of information are available?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings

- Range of inks commonly used in 4 or more colour printing, including standard and special colours

Colours matching systems

- Use of viscosity controls, densitometers and spectrophotometry

Machines

- Range of stack, in-line and central impression flexographic printing machines with manual, semi-automated, fully automated or computerised process control

Design

- 4 or more colours, complex graphics and text. Critical "tight" registration, fit and position, registration should be at least that required for four-colour process work

In-line processes

- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such

Substrate types

- Range of substrates within the major categories of paper, pressure sensitive material, board, corrugated board, plastics and related films, or metal

Substrate handling

- Wide and narrow reel delivery systems

Degree of autonomy

- Working independently in consultation with others

Non-routine

- Non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Set up flexographic printing machines for non-routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Set up a flexographic printing machine for a complex job on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to manufacturer's and job specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- a wide or narrow flexographic press

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR314B Produce complex flexographic printed product
- ICPPR411B Mount and demount flexographic plates for complex printing
ICPPR414B Produce specialised flexographic printed product

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce specialised flexographic printing that requires a certain amount of problem solving and experimentation with the substrate and press settings.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to operate a reel-fed flexographic press ensuring an efficient production flow for specialised jobs that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector
Printing

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<th>PERFORMANCE CRITERIA</th>
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<td>1.1 Flexographic plate and plate cylinder or sleeve condition is monitored, evaluated and adjusted to ensure the quality of printed product meets the standard of the approved proof</td>
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<td></td>
<td>1.2 Flexographic impression roller condition is monitored and evaluated to ensure the quality of printed product meets the standard of approved proof</td>
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<td>1.3 Flexographic inking system and doctor blade condition is monitored, evaluated and adjusted to ensure quality of specialised printed product meets the standard of approved proof</td>
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<td>1.4 Drying systems are monitored, evaluated and adjusted to ensure quality of the specialised printed product meets the standard of approved proof</td>
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<tr>
<td>2. Maintain specialised production process</td>
<td>2.1 Production process is maintained in association with fellow workers and according to enterprise procedures and planned daily schedule</td>
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<td>2.4 Performance is monitored, adjusted and verified using the process control system according to enterprise procedures</td>
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<tr>
<td></td>
<td>2.5 Ink performance, colour, register and position of print are monitored, evaluated and adjusted throughout production run</td>
</tr>
</tbody>
</table>
3. Tune and adjust machinery

3.1 Idiosyncrasies of machines are reviewed and adjustments or tuning undertaken to compensate or to exploit the idiosyncrasy, within manufacturer’s specifications

3.2 Options are assessed to determine most effective / efficient method of production, ensuring highest quality and yield from machinery

3.3 A test run confirms correct options and settings or the need for further adjustment or tuning to meet quality standards

3.4 Options and recommendations are documented for future reference according to enterprise procedures

3.5 Instruction on new practices is provided to machine operator or finisher, if required

4. Troubleshoot machinery and material problems

4.1 Corrective or preventive action is recommended and implemented where appropriate

4.2 Changes are communicated to relevant personnel in a logical and easily understood manner

4.3 Changes are monitored to confirm improvement to production efficiency

4.4 Ongoing problems are reported according to enterprise procedures

5. Conduct shutdown of production process

5.1 Correct shutdown sequence is followed according to manufacturer’s specifications and enterprise procedures

5.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

5.3 Reels and cores are removed from press

5.4 Unused ink is drained back to containers and correctly labelled and stored according to manufacturer’s / supplier’s specifications and enterprise procedures

5.5 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

5.6 All product is removed from operating area
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by providing feedback to internal and external clients
- Collecting, analysing and organising information by identifying and recording specialised production practices
- Planning and organising activities by adjusting the production process to achieve specialised printing requirements
- Teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production
- Mathematical ideas and techniques by calculating consumables and personnel requirements to meet production schedules
- Problem-solving skills by adjusting machinery settings to determine the required tolerances to meet specialised requirements
- Use of technology by using machinery to produce specialised flexographic printed product

Required knowledge:
The following knowledge must be assessed as part of this unit:

Reel transportation and web control

- What could cause the reel to wander?
- What could cause the web to break at the unwind unit?
- What is the difference between a "flying paster" and "zero speed" type reel-stand?
- What print fault would result from the reel being run out of centre?
- What possible faults in the unwind section could cause a web break?

Reel delivery for rewinding and sheeting

- What are the OHS risks associated with rewinding and sheeting?
- What safety feature is in the delivery system if the web jams up?
- Why would the sheet cut-off wander?
- What is the effect of poorly adjusted nip rollers when rewinding and sheeting?

Printing and drying units

- What could be the result if the plate lifts on the leading edged during a print run?
- How could a build-up of ink on the impression cylinder affect the printed product?
- What could cause the ink to foam in the ink tray?
- What is the effect of too much reducer in the ink?
- What action reduces wear of the doctor blade?
- Why is it necessary that all solvents be removed from the final ink film?
- What is the link between driers and set off and marking?
- What causes UV ink to dry?
- What could cause the substrate to distort?
- What would be the effect in the chillers if the drying temperature was too low?
- What is the effect of incorrect drying temperature on the finished product?
- Why is it not advisable to eat or drink near the machine when using UV inks?
In-line processes

- Why is it necessary to frequently examine the in-line components of the job?
- How is the consistency of the punching unit checked?
- What would be the result of excessive pressure on the slitters?

Maintaining production process

- What safety features within the organisation aid in maintaining effective production?
- Who would be held legally responsible for the removal of machine guards and / or disconnection of micro switches?
- What is the effect of inadequate communication within the work team on a flexographic printing machine?
- What are the ramifications if machine guards are removed and / or micro switches are disconnected on a machine?
- What other measurement besides optimum solid ink density can be measured to assess print quality?
- What is the most accurate method of checking register during a production run?
- Why is it necessary to take immediate action when production problems are anticipated?
- What action is taken to eliminate further processing of unacceptable printed product?
- What will be the result to the substrate if the relative humidity is increased in the press room?
- What is the procedure to care for a newly delivered substrate to the press room?
- Why should waste be sorted?
- What is the advantage of keeping reusable waste?

Client liaison

- What industry standards can be applied to enhance effective communication with the client?
- What are the necessary procedures that the client should follow to "OK" a printed product?

Flexographic machine operating problems

- When would it be necessary to call service personnel to correct a machine problem?
- What enterprise procedures are in place to report any machine operating problems?

Shutdown procedures

- What would be the result if correct shutdown procedures were not followed?
- Why is it necessary that correct shutdown procedures are conducted with fellow workers?
- What advantages result from proper labelling and storage of excess inks and materials?
- Why should the printed product be clearly labelled prior to removal from the press room?
- What further operations are required for printed reels upon removal from the printing machine?
- How should the printed job be stored after removal from the printing machine?

Completing production records

- How are completed records used in the final analysis of the job?
- What are the benefits of comprehensive records when considering the production of future jobs?

Information sources

- What machine manuals, safety and other documentation are relevant to this task and
where are they kept?
• What information is included in these documents?
• What other sources of information are available?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
• Range of inks commonly used in 4 or more colour printing, including standard and special colours

Colour matching systems
• Use of viscosity controls, densitometers and spectrophotometry

Machines
• Range of stack, in-line and central impression flexographic printing machines with manual, semi-automated, fully automated or computerised process control

Design
• 4 or more colours, complex graphics and text. Critical "tight" registration, fit and position, registration should be at least that required for four-colour process work

In-line processes
• Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such

Substrate types
• Range of substrates within the major categories of paper, pressure sensitive material, board, corrugated board, plastics and related films, or metal

Substrate handling
• Wide and narrow reel delivery systems

Degree of autonomy
• Working independently in consultation with others
Specialised

• Specialised within this context relates to the set up and production of print runs that involve new products, or a new mix of substrates and inks that requires a certain amount of problem solving and experimentation with the substrate and press settings. The set up of equipment and production involves the development of new set up and production approaches based on solving technical problems arising from new product or equipment combinations.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

• Operate a reel-fed flexographic press ensuring an efficient 3 or more colour production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.
• Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.
• Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
• Monitor production output and make necessary adjustments to maintain print quality on a flexographic machine whilst producing a complex print on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to job specifications, enterprise procedures and the Performance Criteria.
• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.

Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
• flexographic press.
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR413B Set up for complex flexographic printing
- ICPPR314B Produce complex flexographic printed product
ICPPR421B Set up for complex gravure printing

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to set up for non-routine gravure printing.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to set up gravure printing machines for non-routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Confirm non-routine job specifications
   1.1 Job requirements are read and interpreted from job documentation or production control system
   1.2 Set up is planned and carried out correctly in minimum time with minimum wastage
   1.3 Availability of all job related components is checked

2. Set up reels
   2.1 Unwind and rewind reels are is set up and adjusted according to job specifications
   2.2 Webbing procedures are carried out according to non-routine job specifications
   2.3 Web-control system is set up and adjusted according to job specifications
   2.4 Reels are spliced / joined according to job specifications
   2.5 Printed web viewing devices are set up and adjusted according to job specifications
   2.6 The folder and sheeter is are set up and adjusted according to job specifications
   2.7 Set off / marking prevention devices are set up and adjusted according to job specifications

3. Select and prepare inks and additives
   3.1 Inks, dyes or additives are selected according to job specifications and end-user requirements
   3.2 Quality and suitability of inks, dyes or additives are checked and appropriate action is taken
   3.3 Inks, dyes and additives are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste
   3.4 Correct colour and weight / volume of ink are mixed and prepared to match the requirements of the printing process and job specifications
   3.5 Formulation of the ink, colour match and the approved colour are appropriately recorded
   3.6 Inks, dyes and additives are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions to prevent damage and hazards to personnel and prolong shelf life
4. Set up machine for complex gravure printing

4.1 Gravure cylinders are selected, installed, set up and adjusted according to job specifications
4.2 Impression roller is set up and adjusted according to job specifications
4.3 Inking system / doctor blade is set up and adjusted according to the gravure process and job specifications
4.4 Drying system is set up and adjusted according to job specifications

5. Conduct proof run

5.1 Material to be used for proof is organised correctly
5.2 Machine is operated according to manufacturer's and enterprise procedures to produce a specified proof
5.3 Machine is operated according to manufacturer's and enterprise procedures to produce a specified proof
5.4 Production does not commence without client OK or authority where appropriate
5.5 Results are interpreted and adjustments are carried out according to product and machine specifications to determine adjustment requirements
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by interpreting the job brief and providing advice to internal or external clients about options and limitations
• Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
• Planning and organising activities by providing information about time and materials requirements for production scheduling
• Teamwork when cooperating with other workers and coordinating the production unit to ensure efficient operation
• Mathematical ideas and techniques by calculating cylinder position, pressures and substrate requirements
• Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
• Use of technology by using monitoring equipment and computerised production records

Required knowledge:

The following knowledge must be assessed as part of this unit:

Complex job specifications

• Why is it necessary to ensure that the job specifications are read and properly understood?
• What production problems could eventuate by not reading and understanding the job specifications?
• Who would you discuss any production problems with?

Printing cylinders

• What OHS precaution must be observed when installing printing cylinders on the machine?
• How should you determine the optimum print sequence?
• What visual aid on the cylinder identifies the colour of ink to be used?
• What precautions are taken to ensure that the cylinders are not damaged during installation?

Reel transportation system

• What OHS precautions must be observed when webbing up the machine?
• How should you determine the position of the reel?
• What can happen if the brake tension is not set correctly?
• What is the function of the "Dancer" roller on a web machine?
• What can happen if the web is not spliced correctly?
• How does the particular web viewing device work?
• What is the principle of ESA roller operation on the gravure printing machine?
• On what type of substrate should the ESA roller be used?

Delivery system
• What OHS precautions must be observed when setting up the delivery?
• How is the web controlled in the rewind unit?
• What is the result of incorrect rewind tension?
• What remedial steps can be taken if there is a possibility of the ink marking in the rewind?
• What problems could be attributed to a blunt knife when sheeting?
• What function does the use of air blast play in the delivery of sheets?

Inks and additives
• What OHS precautions must be observed when preparing inks and additives?
• What details are necessary to check an ink’s suitability for the printing process?
• What special end-use requirements may be necessary?
• Why are additives used in gravure inks?
• What is the range in seconds for zahn cup measurements?
• What effect does foaming have in a zahn cup when measuring the ink viscosity?
• Why should pigmented ink be brought to operating temperature before correcting the viscosity?
• Why are these checks essential?
• What is the advantage of using automatic viscosity controllers?
• What precautions do you observe to minimise waste when preparing the ink?
• What is the shelf life of most inks?
• What conditions are relevant to the storage of inks and additives?
• What conventions should be adhered to when labelling mixed inks?
• What is the advantage of using high velocity air in the drying system?

Complex machine set up
• What OHS factors need to be considered when setting up the machine?
• What is the function of chill rollers on a machine?
• What is the main advantage of gauging up and dry register prior to printing a job?
• What would be result of excess printing pressure?
• How is the pressure to be applied to the doctor blade determined?
• What print faults could be caused by excessive overspill of air from the inter-colour drier?
• What is the recommended air ratio for efficient inter-colour drying?
• What are the advantages of using high velocity air in the drying system?

In-line units
• What OHS precautions must be observed when slitting on the machine?
• What is the pre-heat web temperature required for lamination?
• What are the reasons for a printed product to be punched?
• What do you need to consider when setting hole punching in relation to repeat length?
• What is the purpose of the dwell when cutting and creasing in-line?
• How is the ratio of print to in-line speed controlled?
• What would be the result of excessive pressure on the slitters?

Problem solving proofing and adjustment
• What will cause the doctor blade to wear on a gravure printing unit?
• How can the wear of the doctor blade be reduced?
How was the optimum make ready speed determined for the job?
How were the steps involved in make ready communicated to other team members?
Why is it necessary to grade the drying speeds of each progressive colour, so that first-down colours dry faster the subsequent colours?
What could cause a decrease in web tension?
What could be the result of increasing rewind tension after the roll has been partially rewound?
What would be the major cause of a telescopic roll?
How would you test metallised film to find out which is the correct side on which to print?
How is the metallised surface measured for coating thickness?
How does annealing affect aluminium foil?
What is the purpose of using thermal imaging face stocks?
How are substrates metallised?
What are the client requirements for bar codes?
What print characteristics are related to excessive printing pressure?
What causes picking when printing multicoloured work?
What are the print faults resulting from using an over-reduced ink?
What are the causes of moire patterns when printing by the gravure process?
What is the instrument used to identify retained solvent trapped in the print?
What is the purpose of taking Dyne readings?
What is the purpose of the crinkle test when testing an ink?
What would be the print faults resulting from a worn doctor blade?
When checking the viscosity for an ink whilst using ink pumps, why should the ink returning from the ink fountain not be used?
What problems result from the excessive use of slow solvents?
Why do laminating inks once printed appear dull and easy to scratch?
What will be the result of excessive print area tension?
What are some of the problems which the printer may associate with cold seals?
Who has the final say in the "OK" of the job?

Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?
- What other sources of information are available?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
- Range of inks commonly used in 3 or more colour printing, including standard and special colours

Colour matching systems
- Use of viscosity controls, densitometers and spectrophotometry
Machines

- Range of stack, in-line and central impression printing machines with manual, semi-automated, fully automated or computerised process control

Design

- 3 or more colours, complex graphics and text. Critical "tight" registration, fit and position, registration should be at least that required for four-colour process work

In-line processes

- Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g., flat-bed cutting, folding) it should be assessed as such

Substrate types

- Range of substrates within the major categories of paper, board, plastics and related films, or metal

Substrate handling

- Wide and narrow reel handling systems

Degree of autonomy

- Working independently in consultation with others

Non-routine

- Non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally
Critical aspects for assessment and evidence required to demonstrate competency:

Evidence of the following is essential:

- Set up gravure printing machines for non-routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
- Set up a gravure printing machine for a complex job on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to manufacturer's specifications, enterprise procedures and the Performance Criteria.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.

Context of and specific resources for assessment:

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
- gravure printing machine.

Method of assessment:

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR422B Produce complex gravure printed product.
ICPRR422B Produce specialised gravure printed product

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce specialised gravure printed product that requires a certain amount of problem solving and experimentation with the substrate and press settings.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to operate a gravure press ensuring an efficient production flow for specialised jobs that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Maintain specialised gravure printing process

1.1 Gravure cylinder condition is monitored, evaluated and adjusted to ensure the quality of printed product meets the standard of the sample sheet

1.2 Gravure impression roller condition is monitored, evaluated and maintained to ensure that the quality of the specialised printed product meets the standard of the sample sheet

1.3 Gravure inking system and doctor blade are monitored, evaluated and adjusted to ensure quality of specialised printed product meets the standard of sample sheet

1.4 Drying systems are monitored, evaluated and adjusted to ensure quality of specialised printed product meets the standard of approved proof

1.5 In-line printing / converting / binding / finishing processes are monitored, evaluated and adjusted to ensure quality of specialised product meets the standard of the approved proof
| 2. Maintain specialised production process | 2.1 Production process is operated in association with fellow workers and according to enterprise procedures and planned daily schedule |
| 2.2 Production is maintained according to OHS requirements, manufacturer's specifications and enterprise procedures |
| 2.3 Manual and/or automatic control is used according to job specifications |
| 2.4 Performance is monitored and verified using the process control system according to enterprise procedures |
| 2.5 Ink performance, colour, register and position of print are monitored, evaluated and adjusted throughout production run |
| 2.6 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention |
| 2.7 Process adjustments to eliminate problems are reported according to enterprise procedures |
| 2.8 Waste is sorted according to enterprise procedures |
| 3. Tune and adjust machinery | 3.1 Idiosyncrasies of machines are reviewed and adjustments or tuning undertaken to compensate or to exploit the idiosyncrasy, within manufacturer's specifications |
| 3.2 Idiosyncrasies of machines are reviewed and adjustments or tuning undertaken to compensate or to exploit the idiosyncrasy, within manufacturer's specifications |
| 3.3 A test run confirms correct options and settings or the need for further adjustment or tuning to meet quality standards |
| 3.4 Options and recommendations are documented for future reference according to enterprise procedures |
| 3.5 Instruction on new practices is provided to machine operator or finisher, if required |
| 4. Troubleshoot machinery and material problems | 4.1 Corrective or preventive action is recommended and implemented where appropriate |
| 4.2 Changes are communicated to relevant personnel in a logical and easily understood manner |
| 4.3 Changes are monitored to confirm improvement to production efficiency |
| 4.4 Ongoing problems are reported according to enterprise procedures |
5. Conduct shutdown of production process

5.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures
5.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements
5.3 Unused ink is correctly labelled and stored according to manufacturer's / supplier's specifications and enterprise procedures
5.4 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures
5.5 All product is removed from operating area
5.6 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures
5.7 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by providing feedback to internal and external clients about printing, in-line processes and job specifications
• Collecting, analysing and organising information by collating details of job and machine specifications and printing processes to ensure efficient production
• Planning and organising activities by providing information about time and materials requirements for production scheduling
• Teamwork when maintaining the production process in association with others
• Mathematical ideas and techniques by calculating consumables and personnel requirements to meet production schedules
• Problem-solving skills by identifying print problems and correcting during print run
• Use of technology by using monitoring systems, understanding their output and feeding into production management systems

Required knowledge:
The following knowledge must be assessed as part of this unit:

Reel transportation and web control

• What could cause the reel to wander?
• What could cause the web to break at the unwind unit?
• What is the difference between a "flying paster" and "zero speed" type reel-stand?
• What print fault would result from the reel being run out of centre?
• What possible faults in the unwind section could cause a web break?

Reel delivery for rewinding and sheeting

• What are the OHS risks associated with rewinding and sheeting?
• What safety feature is in the delivery system if the web jams up?
• Why would the sheet cut-off wander?
• What is the effect of poorly adjusted nip rollers when rewinding and sheeting?

Printing and drying unit

• How could a build-up of ink on the impression cylinder effect the printed product?
• What could cause the ink to foam in the ink tray?
• What is the effect of too much reducer in the ink?
• What action reduces wear of the doctor blade?
• Why is it necessary that all solvents be removed from the final ink film?
• What is the link between driers and set off and marking?
• What could cause the substrate to distort?
• What would be the effect in the chillers if the drying temperature was too low?
• What is the effect of incorrect drying temperature on the finished product?

Maintaining specialist production process

• What is the effect of inadequate communication within the work team on a gravure printing machine?
• What safety features within the organisation aid in maintaining effective production?
• What are the ramifications if machine guards are removed and / or micro switches are disconnected on a machine?
• Who would be held legally responsible for the removal of machine guards and / or disconnection of micro switches?
• What is the most accurate method of checking register during a production run?
• Why is it necessary to take immediate action when production problems are anticipated?
• What action is taken to eliminate further processing of unacceptable printed product?
• What will be the result to the substrate if the relative humidity is increased in the press room?
• What is the procedure to care for a newly delivered substrate to the press room?
• Why should waste be sorted?
• What is the advantage of keeping reusable waste?

Client liaison
• What industry standards can be applied to enhance effective communication with the client?
• What are the necessary procedures that the client should follow to "OK" a printed product?

Gravure machine operating problems
• When would it be necessary to call service personnel to correct a machine problem?
• What enterprise procedures are in place to report any machine operating problems?

Shutdown procedures
• What would be the result if correct shutdown procedures were not followed?
• Why is it necessary that correct shutdown procedures are conducted with fellow workers?
• What advantages result from proper labelling and storage of excess inks and materials?
• Why should the printed product be clearly labelled prior to removal from the press room?
• What further operations are required for printed reels upon removal from the printing machine?
• How should the printed job be stored after removal from the printing machine?

Completing production records
• How are completed records used in the final analysis of the job?
• What are the benefits of comprehensive records when considering the production of future jobs?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
- Range of inks commonly used in specialised colour printing, including standard and special colours

Colour matching systems
- Use of viscosity controls, densitometers and spectrophotometry

Machines
- Range of stack, in-line and central impression printing machines with manual, semi-automated, fully automated or computerised process control

Design
- Complex graphics and text. Critical "tight" registration, fit and position, registration should be at least that required for four-colour process work

Substrate types
- Range of substrates within the major categories of paper, pressure sensitive materials, board, plastics and related films, or metal

Substrate handling
- Wide and narrow reel handling systems

Degree of autonomy
- Working independently in consultation with others

Specialised
- Specialised within this context relates to the set up and production of print runs that involve new products, or a new mix of substrates and inks that requires a certain amount of problem solving and experimentation with the substrate and press settings. The set up of equipment and production involves the development of new set up and production approaches based on solving technical problems arising from new product or equipment combinations
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Operate a gravure press ensuring an efficient specialised production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
- Monitor production output and make necessary adjustments to maintain print quality on a gravure machine whilst producing a complex print on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to job specifications, enterprise procedures and the Performance Criteria.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
- gravure printing machine

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR421B Set up for complex gravure printing
- ICPPR322B Produce complex gravure printed product
ICPRR431B Set up for complex lithographic printing

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to set up for complex lithographic printing.

Employability Skills

This unit contains employability skills.

Application of the Unit

This unit requires the individual to evaluate set up options and then set up either wide or narrow reel or sheet-fed lithographic printing machines for non-routine print jobs. The individual will conduct proof run and adjust settings to ensure production speeds are attained in minimum time with minimum wastage.

Unit Sector

Printing

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</table>
| 1. Confirm complex job specifications | 1.1 Job requirements are read and interpreted from job documentation or production control system  
1.2 Non-routine set up is planned and carried out correctly in minimum time with minimum wastage  
1.3 Availability of all job related components is checked |
| 2. Set up reel system (OR Element 3) | 2.1 Unwind and rewind reels set up options are analysed and set up is completed and adjusted according to job specifications  
2.2 Webbing procedures are carried out to meet non-routine job specifications  
2.3 Web-control system is set up options are analysed and set up is completed and adjusted according to job specifications  
2.4 Reels are spliced / joined according to job specifications  
2.5 Printed web viewing devices are set up and adjusted according to job specifications  
2.6 The folder and sheeter are set up and adjusted according to job specifications  
2.7 Set off / marking prevention devices are set up and adjusted according to job specifications |
| 3. Set up sheet system (OR Element 2) | 3.1 Feeder and delivery sections are set up options are analysed and set up is completed and adjusted to non-routine suit job specifications  
3.2 Sheet pick-up, transportation, control and transfer systems are set up and adjusted according to job specifications  
3.3 Substrate is removed from process according to job instructions  
3.4 Set off / marking prevention devices are set up and adjusted according to job specifications |
4. Select and prepare inks and additives

4.1 Colour sequence for the job is considered and confirmed

4.2 Inks, dyes or additives are selected according to non-routine job specifications and end-user requirements

4.3 Quality and suitability of inks, dyes or additives are checked and appropriate action is taken

4.4 Inks, dyes and additives are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste

4.5 Correct colour and weight / volume of ink is mixed and prepared to match the requirements of the job specification and the non-routine printing process

4.6 Formulation of the ink, colour match and the approved colour are appropriately recorded

4.7 Inks, dyes and additives are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions to prevent damage and hazards to personnel and prolong shelf life

5. Set up machine for complex lithographic printing

5.1 Plate cylinder is set up and adjusted according to job specifications

5.2 Plate cylinder is set up and adjusted according to job specifications

5.3 Plates are correctly mounted according to specification and in a safe manner

5.4 Blanket and blanket cylinder are set up and adjusted according to job specifications

5.5 Impression cylinder is set up and adjusted according to job specifications

5.6 Inking system is set up and adjusted according to the lithographic process and job specifications

5.7 Dampening system is set up and adjusted according to job specifications

5.8 Drying system is set up and adjusted according to job specifications

6. Conduct proof run

6.1 Material to be used for proof is organised correctly

6.2 Machine is operated according to manufacturer's and enterprise procedures to produce a specified proof

6.3 Production does not commence without client OK or authority where appropriate

6.4 Results are interpreted and adjustments are carried out according to product and machine specifications
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting the job brief and providing advice to internal or external clients about options and limitations
- Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when cooperating with other workers and coordinating the production unit to ensure efficient operation
- Mathematical ideas and techniques by calculating substrate requirements, plate position and pressures
- Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
- Use of technology by using monitoring equipment and computerised production records

Required knowledge:
The following knowledge must be assessed as part of this unit:

Complex job specifications
- Why is it necessary to ensure that the job specifications are read and properly understood?
- What production problems could eventuate by not reading and understanding the job specifications?
- With whom would you discuss any production problems?

Preparing and fitting plates
- What problem can result from the plate cylinder not being cleaned prior to plate fitting?
- What could happen if the plate is over tensioned during fitting?
- What faults could result from a plate being under tensioned?
- Why is accurate plate bending necessary on a web-fed machine?
- What considerations would have to be made when deciding the colour sequence?
- What visual aid on the plate identifies the colour of ink to be used?

Reel transportation system on a web-fed machine
- What OHS precaution must be observed when webbing up the machine?
- How should you determine the position of the reel?
- What can happen if the brake tension is not set correctly?
- What is the function of the "Dancer" roller on a web machine?
- How should you determine the position of the bustle wheels?
- What can happen if the web is not spliced correctly?
- How does the particular web viewing device work?

Sheet transportation system on a sheet-fed machine
- What OHS factors need to be considered when setting up the sheet transportation and
delivery systems?
• What could cause more than one sheet to be picked up in the feeder?
• Why is accurate feeder set up essential?
• What determines the position of the sheet prior to being transferred to the printing unit?
• How should you determine which front lays to use?
• What type of substrate would require additional front lays to be engaged?
• Why would additional front lays be necessary when printing this type of substrate?

Reel delivery system on a web-fed machine
• What OHS precaution must be observed when setting up the delivery?
• How is the web controlled in the rewind unit?
• What is the function of a slitter on a web machine?
• What could cause the web to jam up in the folder?
• Why is it necessary to disengage the folder if sheeting?
• What problems could be attributed to a blunt knife when sheeting?
• What safety feature is in the delivery system if the web jams up?
• Which fold is always made with the grain of the web?
• What type of folder, folds the web in half in the direction of the web grain?
• What remedial steps can be taken if there is a possibility of the ink marking in the folder?
• What is the main reason for having a silicone applicator on a web machine?

Sheet delivery system on a sheet-fed machine
• What OHS precaution must be observed when removing sheets from the delivery?
• What could cause sheets to be delivered incorrectly?
• What adjustments would be necessary if changing from lightweight to heavyweight stocks?
• What determines the sheet release into the delivery?
• What problems result from the excessive use of anti set off spray powder?
• What could cause printed sheets to set off in the delivery?
• How can the possibility of set off in the delivery be reduced?
• What fault may be created if there is excess vacuum on the slow-down wheels?

Inks and additives
• What are the OHS concerns related to the preparation of inks and additives?
• What details are necessary to check an ink’s suitability for the printing process?
• What special end-use requirements may be necessary?
• Why may it be necessary to mix an additive into the ink?
• Explain how a spectrophotometer can be used to assess the colour of an ink.
• Describe the formula for calculating the correct quantity of lithographic ink.
• What print fault will occur if excessive driers are mixed into the ink?
• What precautions do you observe to minimise waste when preparing the ink?
• What is the shelf life of most inks?
• What conditions are relevant to the storage of inks and additives?
• What conventions should be adhered to when labelling mixed inks?

Complex machine set up
• What OHS factors need to be considered when setting up the machine?
• What checks should be made on the plate prior to fitting?
• How much plate packing was required?
• What is the normal printing pressure required between plate and blanket?
• How should you determine the correct printing pressure between blanket and stock?
• What is the ideal blanket surface condition?
• How is the correct blanket tension achieved when fitting a new blanket?
• What print faults can occur if the impression cylinder is not maintained?
• In what order should eccentric or concentric roller adjustments be made?
• When setting the rollers, what should be the width of the contact stripe between two rollers?
• How should you determine the ink duct setting?
• What is the ideal ink duct sweep setting?
• What is the recommended degrees shore hardness for bare back and conventional dampeners?
• What should be the conductivity of the fountain solution?
• Why is it necessary to constantly check the conductivity of the fountain solution?
• How could you change the amount of fountain solution across the plate surface?
• Why may it be necessary to adjust the fountain solution laterally?
• Why could you not engage the perfecting unit on the run?
• What is the main reason for blistering on a heatset machine?
• What does the oven evaporate from the ink?
• What is the function of chill rollers on a web machine?
• What are the types of ink drying / curing systems?

In-line processes
• What OHS precaution must be observed when slitting on the machine?
• What operations can be performed with in-line units?
• In what machine position should you engage in-line processing units?
• What precautions are necessary when setting up in-line processing units?
• What are the reasons for a printed product to be punched?
• What do you need to consider when setting hole punching in relation to repeat length?
• What would be the result of excessive pressure on the slitters?

Problem solving proofing and adjustment
• Describe the operation of the true inch function fitted to some machines?
• What problems may cause the machine to keep stopping?
• What checks are necessary prior to engaging the impression?
• What checks are performed when running the machine?
• What effect will the position of certain guards have on the operation of the machine?
• How were the steps involved in operating the machine communicated to other team members?
• What aids are available for the testing of the machine proof?
• What tests are necessary for this job?
• Where should the testing take place?
• What is the function of a polarisation filter in a densitometer?
• What are the ideal conditions for inspecting the proof?
• Why is it necessary to use visual aids on the printed sheets?
• What is the acceptable wet trap value range for lithographic inks?
• What could be used as an indication of optimum solid ink density in the absence of a proof?
• What would be the result of low solid ink density and excessive dot gain?
• What methods are available to check and adjust ink colour and consistency?
• What adjustments may have caused mis-register?
• What adjustments are made to position the image laterally?
• What adjustments are made to position the image circumferentially?
• What adjustments are made to position the image diagonally?
• How can changing the colour sequence affect the wet trap value?
• What is the procedure to lengthen the print length on this type of press?
• What is the procedure to shorten the print length on this type of press?
• What is the difference between mechanical and optical dot gain?
• What can cause excessive mechanical dot gain?
• Who has the final say in the "OK" of the job?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
• Wide range of inks commonly used in printing, including standard and special colours, if required

Colour matching systems
• Use of densitometers and / or spectrophotometry

Machines
• Range of single sheet, stream-fed or reel-fed printing machines with manual, semi-automated, fully automated or computerised process control. Includes machines with digitally imaged plates

Design
• Complex graphics and text. Critical "tight" registration, fit and position, registration for quality print requirements

Substrate types
• Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal

Substrate handling
• Wide and narrow reel, and large and small sheet handling systems

Degree of autonomy
• Working independently in consultation with others
Non-routine

- Non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Set up either wide or narrow reel or sheet-fed lithographic printing machines for non-routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained in minimum time with minimum wastage.
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
- Set up a lithographic printing machine for a complex job on TWO occasions (if possible using different substrates and sheet sizes if sheet-fed and if possible including at least TWO in-line processes) according to job and manufacturer's specifications, enterprise procedures and the Performance Criteria.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
- lithographic printing machine with in-line units.
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

• direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

• ICPPR332B Produce complex lithographic printed product
ICPPR432B Produce specialised lithographic printed product

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce specialised lithographic printed product that requires a certain amount of problem solving and experimentation with the substrate and press settings.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to operate a lithographic press ensuring an efficient specialised production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Maintain specialised lithographic printing process

1.1 Lithographic plate and plate cylinder conditions are monitored, evaluated and adjusted to ensure the quality of the specialised printed product meets the standard of the sample sheet

1.2 Lithographic blanket and blanket cylinder conditions are monitored, evaluated and adjusted to ensure the quality of the specialised printed product meets the standard of sample sheet

1.3 Lithographic impression cylinder condition is monitored, evaluated and adjusted to ensure quality of the specialised printed product meets the standard of sample sheet

1.4 Lithographic inking system is checked and maintained to ensure quality of the specialised printed product meets the standard of sample sheet

1.5 Lithographic dampening system condition is monitored, evaluated and adjusted to ensure quality of the specialised printed product meets the standard of sample sheet

1.6 Set off / marking prevention and drying system is monitored, evaluated and adjusted to ensure quality of the specialised printed product meets the standard of sample sheet

1.7 Drying systems are monitored, evaluated and adjusted to ensure quality of the specialised printed product meets the standard of approved proof
2. Maintain specialised production process

2.1 Production process is operated in association with fellow workers and according to enterprise procedures and planned daily schedule

2.2 Production is maintained according to OHS requirements, manufacturer's specifications and enterprise procedures

2.3 Manual and/or automatic control is used according to job specifications

2.4 Performance is monitored, evaluated and verified using the process control system according to enterprise procedures

2.5 Ink performance, colour, register and position of print are monitored, evaluated and adjusted throughout production run

2.6 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention

2.7 Process adjustments to eliminate problems are reported according to enterprise procedures

2.8 Faulty performance of equipment is identified and reported according to enterprise procedures

2.9 Waste is sorted according to enterprise procedures

3. Tune and adjust machinery

3.1 Idiosyncrasies of machines are reviewed and adjustments or tuning undertaken to compensate or to exploit the idiosyncrasy, within manufacturer's specifications

3.2 Options are assessed to determine most effective/efficient method of production, ensuring highest quality and yield from machinery

3.3 A test run confirms correct options and settings or the need for further adjustment or tuning to meet quality standards

3.4 Options and recommendations are documented for future reference according to enterprise procedures

3.5 Instruction on new practices is provided to machine operator or finisher, if required

4. Troubleshoot machinery and material problems

4.1 Corrective or preventive action is recommended and implemented where appropriate

4.2 Changes are communicated to relevant personnel in a logical and easily understood manner

4.3 Changes are monitored to confirm improvement to production efficiency

4.4 Ongoing problems are reported according to enterprise procedures
5. Conduct shutdown of production process

5.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures
5.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements
5.3 Unused ink is correctly labelled and stored according to manufacturer / supplier specifications and enterprise procedures
5.4 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures
5.5 All product is removed from operating area
5.6 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures
5.7 Repair / adjustment is verified prior to resumption of operations
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by providing feedback to internal and external clients about printing processes and job specifications
- Collecting, analysing and organising information by collating details of job and machine specifications and printing processes to ensure efficient production
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when maintaining the production process in association with others
- Mathematical ideas and techniques by calculating consumables and personnel requirements to meet production schedules
- Problem-solving skills by identifying print problems and correcting during print run
- Use of technology by using monitoring systems, understanding their output and feeding into production management systems

Required knowledge:
The following knowledge must be assessed as part of this unit:

**Reel transportation and web control**

- What OHS concerns are there when operating the reel transportation system?
- What could cause the reel to wander?
- What could cause the web to break at the unwind unit?
- What is the difference between a "flying paster" and "zero speed" type reel-stand?
- What print fault would result from the reel being run out of centre?
- What possible faults in the unwind section could cause a web break?

**Sheet transportation and transfer**

- What OHS concerns are there when operating the sheet transportation system?
- What would be result of worn suckers at the feeder suction head?
- What type of two sheet detection is on this machine?
- How much movement should the sheet have when being registered by the side lay?
- What could cause mis-register of the sheet at the feeder?
- What are the visible signs of the sheet being registered in the feeder?
- How can gripper malfunction affect sheet control and transfer?
- When would sheet transfer mechanisms require adjusting?
- What would cause the feeder stack to become uneven?
- What would be the result of the feeder stack not being loaded level?
- How can any unevenness of the feeder stack be rectified?

**Reel delivery for rewinding and sheeting**

- What are the OHS risks associated with rewinding and sheeting?
- What safety feature is in the delivery system if the web jams up?
- Why would the sheet cut-off wander?
- What is the effect of poorly adjusted nip rollers when rewinding and sheeting?
- What further operations are required for printed reels upon removal from the printing machine?
- How should the printed job be stored after removal from the printing machine?
• Why is it necessary to label each printed reel?

Sheet delivery
• What effect will machine speed have on sheet delivery?
• What is the advantage of spraying moving sheets with anti set off powder in the delivery?
• What items in the delivery could cause marking of the printed image?
• What remedial steps may be necessary to eliminate marking of the printed image?
• What is the function of a sheet decurler fitted to the delivery of some machines?
• What faults could result from incorrectly set grippers in the transfer section of a machine?
• How should the printed job be stored after removal from the printing machine?

Printing unit
• What could be the result if the plate develops a crack at the grip edge during a print run?
• What would be the effect of a sticky blanket surface?
• What print faults would result from the blanket not being tensioned correctly?
• What would be the cause of blanket packing creep during printing?
• How could a build-up of ink on the impression cylinder affect the printed product?
• What could cause the ink to lie back in the duct?
• What could cause ink stripping on the inking rollers?
• What print faults would result from excessive use of fountain solution on the plate?
• What is the recommended pH range for fountain solutions?
• What could cause the conductivity of the fountain solution to change over an eight-hour shift?
• What problems can be caused by excessive conductivity of the fountain solutions?

Drying unit
• Why is it not advisable to eat or drink near the machine when using UV inks?
• What is the link between driers and set off and marking?
• What causes UV ink to dry?
• What could cause the substrate to blister?
• What would be the effect in the chillers if the drying temperature was too low?
• What is the effect of incorrect drying temperature on the finished product?

Maintaining production process
• What is the effect of inadequate communication within the work team on a lithographic printing machine?
• What safety features within the organisation aid in maintaining effective production?
• What are the ramifications if machine guards are removed and / or micro switches are disconnected on a machine?
• Who would be held legally responsible for the removal of machine guards and / or disconnection of micro switches?
• What is the disadvantage of using a closed looped system for automatic control of the printed product?
• What other measurement besides optimum solid ink density can be measured to assess print quality?
• What is the most accurate method of checking register during a production run?
• Why is it necessary to take immediate action when production problems are anticipated?
• What action is taken to eliminate further processing of unacceptable printed product?
• How will a stack of paper be affected if the relative humidity is increased in the press room?
What is the procedure to care for a newly delivered skid of paper to the press room?  
Why should waste be sorted?  
What is the advantage of keeping reusable waste?

Client liaison  
What industry standards can be applied to enhance effective communication with the client?  
What are the necessary procedures that the client should follow to "OK" a printed product?

Specialised lithographic machine operating problems  
When would it be necessary to call service personnel to correct a machine problem?  
What enterprise procedures are in place to report any machine operating problems?

Shutdown procedures  
What would be the result if correct shutdown procedures were not followed?  
Why is it necessary that correct shutdown procedures are conducted with fellow workers?  
What advantages result from proper labelling and storage of excess inks and materials?  
Why should the printed product be clearly labelled prior to removal from the press room?

Completing production records  
How are completed records used in the final analysis of the job?  
What are the benefits of comprehensive records when considering the production of future jobs?

Information sources  
What machine manuals, safety and other documentation are relevant to this task and where are they kept?  
What information is included in these documents?  
What other sources of information are available?

RANGE STATEMENT  
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings  
Wide range of inks commonly used in printing

Colour matching systems  
Use of densitometers and / or spectrophotometry

Machines  
Range of single sheet, stream-fed or reel-fed printing machines with manual, semi-automated, fully automated or computerised process control. Includes machines with digitally imaged plates
Design

- Complex graphics and text. Critical "tight" registration, fit and position, registration for quality print requirements

Substrate types

- Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal

Substrate handling

- Wide and narrow reel, and large and small sheet handling systems

Degree of autonomy

- Working independently in consultation with others

Specialised

- Specialised within this context relates to the set up and production of print runs that involve new products, or a new mix of substrates and inks that requires a certain amount of problem solving and experimentation with the substrate and press settings. The set up of equipment and production involves the development of new set up and production approaches based on solving technical problems arising from new product or equipment combinations

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Operate a lithographic press ensuring an efficient specialised production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Monitor production output and make necessary adjustments to maintain print quality on a lithographic machine whilst producing a specialised print on TWO occasions (if possible using different types and sizes of substrates) according to job specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity
Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- lithographic printing machine

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR332B Produce complex lithographic printed product
- ICPPR431B Set up for complex lithographic printing
ICPPR441B Set up for complex pad printing

**Unit Descriptor**
This unit describes the performance outcomes, skills and knowledge required to set up for complex pad printing.

**Employability Skills**
This unit contains employability skills.

**Application of the Unit**
This unit requires the individual to set up pad printing machines for multicoloured or non-routine print jobs. The individual will set up manual pre- and post-treatment processes, conduct a proof run and adjust settings to ensure production speeds are attained.

**Unit Sector**
Printing

**ELEMENT** | **PERFORMANCE CRITERIA**
--- | ---
1. Confirm non-routine job specifications | 1.1 Job requirements are read and interpreted from job documentation or production control system
1.1. Job requirements are read and interpreted from job documentation or production control system
1.2 Set up is planned and carried out correctly in minimum time with minimum wastage
1.3 Availability of all job related components is checked
2. Install tampons (printing pads) into machine | 2.1 Appropriate tampons are selected according to non-routine job specifications / requirements
2.1. Appropriate tampons are selected according to non-routine job specifications / requirements
2.2 Tampons are secured into machine
3. Set up fixtures onto machine bed or conveyor | 3.1 Appropriate fixtures are selected and secured to xy table or conveyor jig plates
3.1. Appropriate fixtures are selected and secured to xy table or conveyor jig plates
3.2 Adjust height of machine bed to suit size of object to be printed
3.3 Adjust xy table of machine bed to suit position of image on object
4. Select and prepare inks and additives | 4.1 Inks, and additives are selected according to non-routine job specifications and end-user requirements
4.1. Inks, and additives are selected according to non-routine job specifications and end-user requirements
4.2 Quality and suitability of inks and additives are checked and appropriate action is taken
4.3 Inks and additives are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste
4.4 Correct colour and weight / volume of ink is mixed and prepared to match the requirements of the non-routine job specification and the printing process
4.5 Formulation of the ink, colour match and the approved colour are appropriately recorded
4.6 Inks and additives are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions to prevent damage and hazards to personnel and prolong shelf life
5. Set up machine for complex pad printing
   5.1 Plate holders are set up and adjusted for register according to job specifications
   5.2 Appropriate plates and plate holders are selected and plates are secured into plate holders
   5.3 Tampons are set up and adjusted according to job specifications
   5.4 Spatula and doctor blade are set up and adjusted according to the pad printing process and job specifications OR
   5.5 Ink cups are set up and adjusted according to job specifications

6. Set up pre- and post-treatment in-line processes
   6.1 In-line loading is set up to suit non-routine object and according to job specifications
   6.2 In-line pre-treatment is set up to suit non-routine object and according to job specifications
   6.3 In-line drying is set up to suit non-routine object and according to job specifications
   6.4 In-line ejection is set up to suit non-routine object and according to job specifications

7. Conduct proof run
   7.1 Material to be used for proof is organised correctly
   7.2 Machine is operated according to manufacturer's and enterprise procedures to produce a specified proof
   7.3 Proof is visually inspected and / or tested or laboratory testing organised according to enterprise procedures
   7.4 Production does not commence without client OK or authority where appropriate
   7.5 Results are interpreted and adjustments are carried out according to product and machine specifications to determine adjustment requirements
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting the job brief and providing advice to internal or external clients about options and limitations
- Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when cooperating with other workers and coordinating the production unit to ensure efficient operation
- Mathematical ideas and techniques by calculating substrate requirements, cliche and tampon position, and pressures
- Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
- Use of technology by using monitoring equipment and computerised production records

Required knowledge:
The following knowledge must be assessed as part of this unit:

Substrate identification
- Identify FOUR different substrate groups and suggest the correct ink type for each group.
- For the purpose of ink selection the plastics can be broken down into a number of sub-groups. Identify THREE of these.

Ink selection
- How do you adjust process colour inks for correct colour balance?
- Describe TWO methods of improving opacity of a light coloured ink on a dark substrate.

Pad selection
- How do you determine the correct pad shape for these FOUR (given) applications?
- What effect do pad shape and hardness have on print quality?
- What effect can commonly be seen at the contact point of the nipple of a pad in a large solid print, and how can it be avoided?
- How is a new pad prepared for its first printing?

Plate selection
- How do you determine correct plate type for these THREE (given) applications?
- Explain the difference between steel and photopolymer plates for process printing.

Registration
- What are THREE reasons for mis-registered images and how can they be corrected?

Doctor blades
- What OHS concerns are there when setting presses and doctor blades?
• How do you adjust the machine so that the doctor blade is operating correctly?
• What is the effect of a damaged doctor blade?
• Name TWO types of doctor blades and explain their applications.

Pre- and post-treatment requirements
• What OHS concerns are there when pre- and post-treating substrates?
• What are the common pre- and post-treatment methods for TWO different substrates?
• Why are these treatments important?

Print problem identification and correction
• What are the causes and solutions for SIX common print problems (e.g., hairlines around image, loss of density in the centre of a solid image, fine lines of ink running through image, distortion of image, picking up ink from substrate by subsequent pads, washed out images, loss of fine lines in images, inconsistent colour)?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings • Range of standard inks commonly used in multicoloured printing

Colour matching systems • Use of visual colour assessment to match basic standard colours and / or Pantone shades under controlled lighting conditions

Machines • A range of pad printing machines with manual, semi-automated, fully automated or computerised operation

Design • Multicoloured, complex graphics and text. Critical tight registration, fit and position

Pre and post-treatment processes • Range of pre- and post-treatment techniques used in pad printing

Substrate types • Range of substrates within the major categories of paper, wood, glass (ceramics), plastics, metal
Substrate handling

• Manual handling

Degree of autonomy

• Working independently under limited supervision

Non-routine

• Non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

• Set up pad printing machines for non-routine print jobs. The individual will set up manual pre- and post-treatment processes and conduct a proof run and adjust settings to ensure production speeds are attained
• Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
• Demonstrate an ability to find and use information relevant to the task from a variety of information sources
• Set up a machine for complex pad printing on TWO occasions (if possible on different substrates) according to manufacturer’s and job specifications, enterprise procedures and the Performance Criteria
• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
• a pad printing machine
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended:

- ICPPR342B Produce complex pad printed product
ICPPR442B Produce specialised pad printed product

### Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce specialised pad printed product that requires a certain amount of problem solving and experimentation with the substrate and press settings.

### Employability Skills
This unit contains employability skills.

### Application of the Unit
This unit requires the individual to operate a pad printing machine to produce specialised printed products that meet required quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

### Unit Sector
Printing

#### ELEMENT PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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| 1. Maintain specialised pad printing process | 1.1 Location of objects into fixtures is monitored, evaluated and adjusted if necessary  
1.2 Printing plates condition is monitored and evaluated to ensure the quality of printed product meets the standard of the approved proof  
1.3 Printing pads condition is monitored, evaluated and maintained to ensure the quality of printed product meets the standard of approved proof  
1.4 Spatulas and doctor blades are monitored, evaluated and adjusted to ensure quality of printed product meets the standard of approved proof OR  
1.5 Ink cups are monitored, evaluated and adjusted to ensure quality of printed product meets the standard of approved proof  
1.6 Printing ink viscosity is monitored, evaluated and adjusted to ensure quality of printed product meets the standard of approved proof |
| 2. Maintain in-line systems | 2.1 In-line loading is monitored, evaluated and adjusted to ensure quality of printed product meets the standard of approved proof  
2.2 In-line pre-treatment is monitored, evaluated and adjusted to ensure quality of printed product meets the standard of approved proof  
2.3 In-line drying is monitored, evaluated and adjusted to ensure quality of printed product meets the standard of approved proof |
3. Maintain production process
   3.1 Production process is operated in association with fellow workers and according to enterprise procedures and planned daily schedule
   3.2 Production is maintained according to OHS requirements, manufacturer's specifications and enterprise procedures
   3.3 Manual and / or automatic control is used as required according to job specifications
   3.4 Performance is monitored and verified using the process control system according to enterprise procedures
   3.5 Ink performance, colour, register and position of print are monitored and adjusted throughout production run
   3.6 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention
   3.7 Process adjustments to eliminate problems are reported according to enterprise procedures
   3.8 Waste is sorted according to enterprise procedures

4. Tune and adjust machinery
   4.1 Idiosyncrasies of machines are reviewed and adjustments or tuning undertaken to compensate or to exploit the idiosyncrasy, within manufacturer's specifications
   4.2 Options are assessed to determine most effective / efficient method of production, ensuring highest quality and yield from machinery
   4.3 A test run confirms correct options and settings or the need for further adjustment or tuning to meet quality standards
   4.4 Options and recommendations are documented for future reference according to enterprise procedures
   4.5 Instruction on new practices is provided to machine operator or finisher, if required

5. Troubleshoot machinery and material problems
   5.1 Corrective or preventive action is recommended and implemented where appropriate
   5.2 Changes are communicated to relevant personnel in a logical and easily understood manner
   5.3 Changes are monitored to confirm improvement to production efficiency
   5.4 Ongoing problems are reported according to enterprise procedures
6. Conduct shutdown of production process

6.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures

6.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

6.3 Unused ink is correctly labelled and stored according to manufacturer's / supplier's specifications and enterprise procedures

6.4 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

6.5 All product is removed from operating area

6.6 Machine faults requiring repair are identified and reported, according to enterprise procedures

6.7 Repair / adjustment is verified prior to resumption of operations
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by providing feedback to internal and external clients about printing processes and job specifications
• Collecting, analysing and organising information by identifying and recording specialised production practices
• Planning and organising activities by adjusting the production process to achieve specialised printing requirements
• Teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production
• Mathematical ideas and techniques by calculating consumables and personnel requirements to meet production schedules
• Problem-solving skills by adjusting machinery settings to determine the required tolerances to meet specialised requirements
• Use of technology by using machinery to produce specialised pad printed product

Required knowledge:
The following knowledge must be assessed as part of this unit:

OHS
• What are the major OHS concerns when operating this machine?
• Where are the MSDSs stored and what information do they contain?

Different machine cycle modes
• Explain how the colour density of a light image on a dark substrate can be improved by selection of a different machine cycle mode.
• How do you select the appropriate machine cycle mode to provide the highest production output for a particular product?
• Describe TWO special cycle modes that are available on your machine and their application.

Inks
• How do you determine that ink has been mixed to the correct viscosity?
• How do you correct ink viscosity during production?
• What are TWO causes of unreleased ink remaining on the printing pad and how do you identify them?
• How does the addition of a catalyst affect the pot life of ink and what other factors affect pot life?

Pads
• How do you recognise a damaged pad?
• What is the correct method of cleaning a pad during production?
• In multicoloured printing what can be the effect of different pad shapes for different colours?

Pre- and post-treatment requirements
• How do you determine the time the ink should take to cure before scratch and adhesion tests can be performed?
• What method can be used to check for correct pre-treatment of polypropylene during production?
• How do ensure that drying conditions are correct for the product?

Print problem identification and correction
• Describe FOUR effects that will be visible in the image if the ink viscosity is incorrect.
• How do you identify the cause of incorrect registration and prevent its recurrence?
• What would cause a fine coating of ink over the whole cliche surface?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
• Range of standard inks commonly used in multicoloured printing

Colour matching systems
• Use of visual colour assessment to match basic standard colours and / or Pantone shades under controlled lighting conditions

Machines
• A range of pad printing machines with manual, semi-automated, fully automated or computerised operation

Design
• Multicoloured, complex graphics and text. Critical tight registration, fit and position
• Pre- and post-treatment processes
• Range of pre- and post-treatment techniques used in pad printing

Substrate types
• Range of substrates within the major categories of paper, wood, glass (ceramics), plastics, metal

Substrate handling
• Manual handling
Degree of autonomy

• Working independently under limited supervision

Specialised

• Specialised within this context relates to the set up and production of print runs that involve new products, or a new mix of substrates and inks that requires a certain amount of problem solving and experimentation with the substrate and press settings. The set up of equipment and production involves the development of new set up and production approaches based on solving technical problems arising from new product or equipment combinations.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

• Operate a pad printing machine ensuring an efficient specialised production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
• Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
• Demonstrate an ability to find and use information relevant to the task from a variety of information sources
• Produce TWO complex pad printing jobs (if possible on different substrates) according to job specifications, enterprise procedures and the Performance Criteria
• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
• a pad printing machine
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR342B Produce complex pad printed product
- ICPPR441B Set up for complex pad printing
ICPPR451B  Set up for complex relief printing

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to set up for complex relief printing.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to set up reel- or sheet-fed platen, cylinder or rotary printing machines for non-routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.

Unit Sector
Printing

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<th>PERFORMANCE CRITERIA</th>
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</thead>
<tbody>
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<td>1. Confirm non-routine job specifications</td>
<td>1.1 Job requirements are read and interpreted from job documentation or production control system</td>
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<tr>
<td></td>
<td>1.2 Set up is planned and carried out correctly in minimum time with minimum wastage</td>
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<td></td>
<td>1.3 Availability of all job related components is checked</td>
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<tr>
<td>2. Set up reel system (OR Element 3)</td>
<td>2.1 Unwind and rewind reels are is set up and adjusted according to job specifications</td>
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<tr>
<td></td>
<td>2.2 Webbing procedures are carried out and web-control system is set up and adjusted according to job specifications</td>
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<tr>
<td></td>
<td>2.3 Reels are spliced / joined according to job specifications</td>
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<td>2.4 Printed web viewing devices are set up and adjusted according to job specifications</td>
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<td>2.5 Folder and sheeters are set up and adjusted according to job specifications</td>
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<td>3. Set up sheet system (OR Element 2)</td>
<td>3.1 Feeder and delivery sections are set up and adjusted according to job specifications</td>
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<td>3.2 Sheet pick-up and transportation system is set up and adjusted according to job specifications</td>
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<td></td>
<td>3.5 Set off / marking prevention devices are set up and adjusted according to job specifications</td>
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</tbody>
</table>
4. Select and prepare inks and additives
   4.1 Inks, dyes or additives are selected according to job specifications and end-user requirements
   4.2 Quality and suitability of inks, dyes or additives are checked and appropriate action is taken
   4.3 Inks, dyes and additives are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste
   4.4 Correct colour and weight / volume of ink are mixed and prepared to match the requirements of the printing process and job specifications
   4.5 Formulation of the ink, colour match and the approved colour are appropriately recorded
   4.6 Inks, dyes and additives are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions to prevent damage and hazards to personnel and prolong shelf life

5. Set up machine for complex relief printing
   5.1 Appropriate relief plates are selected and secured to the machine
   5.2 Relief polymer plates / forme are set up and adjusted according to job specifications (platen)
   5.3 Relief polymer cylinders are set up and adjusted according to job specifications (platen)
   5.4 Impression is set up and adjusted according to job specifications (platen and rotary)
   5.5 Inking system is set up and adjusted according to the relief process and job specifications (platen and rotary)
   5.6 Drying system is set up and adjusted according to job specifications

6. Conduct proof run
   6.1 Material to be used for proof is organised correctly
   6.2 Machine is operated according to manufacturer's and enterprise procedures to produce a specified proof
   6.3 Proof is visually inspected and / or tested or laboratory testing organised according to enterprise procedures
   6.4 Production does not commence without client OK or authority where appropriate
   6.5 Results are interpreted and adjustment changes are carried out according to product and machine specifications
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting the job brief and providing advice to internal or external clients about options and limitations
- Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when cooperating with other workers and coordinating the production unit to ensure efficient operation
- Mathematical ideas and techniques by calculating substrate requirements, plate position and pressures
- Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
- Use of technology by using monitoring equipment and computerised production records

Required knowledge:
The following knowledge must be assessed as part of this unit:

**Job requirements**

- Why is it necessary to ensure that the job specifications are read and properly understood?
- What production problems could eventuate by not reading and understanding the job specifications?
- With whom would you discuss any production problems?

**Relief plates**

- Why is hardness of the printing plate important?
- What faults may be detected on new plates?
- What type of solvents should be used on photopolymer plates?
- What does the term V-block mounting mean?
- How is V-block mounting achieved?
- What is the purpose of binding plates after mounting?
- What checks were performed prior to cylinder installation?
- Why should machine frames and unit slides be kept cleaned?
- What OHS precaution must be observed when installing printing cylinders in the machine?
- How should you determine the optimum print sequence?
- What visual aid on the plate identifies the colour of ink to be used?
- What precautions were taken to ensure that the plate / cylinders were not damaged during installation?

**Reel transportation system on a web-fed machine**

- What OHS precaution must be observed when webbing up the machine?
- How should you determine the position of the reel?
- What can happen if the brake tension is not set correctly?
• What is the function of the "Dancer" roller on a web machine?
• What is the function of nip rollers?
• What can happen if the web is not spiced correctly?

Sheet transportation system on a sheet-fed machine
• What are the major OHS concerns when setting up the sheet transportation system?
• What could cause more than one sheet to pick up in the feeder?
• Why is accurate feeder set up essential?
• What determines the position of the sheet prior to being transferred to the printing unit?
• How should you determine which front lays to use?
• What type of substrate would require additional front lays to be engaged?
• Why would additional front lays be necessary when printing this type of substrate?

Reel delivery system on a web-fed machine
• What OHS precaution must be observed when setting up the delivery?
• How is the web controlled in the rewind unit?
• What is the function of a slitter on a web machine?
• What problems could be attributed to a blunt knife when sheeting?
• What remedial steps can be taken if there is a possibility of the ink marking in the rewind?

Sheet delivery system on a sheet-fed machine
• What OHS precaution must be observed when removing sheets from the delivery?
• What could cause sheets to be delivered incorrectly?
• What adjustments would be necessary if changing from lightweight to heavyweight stocks?
• What determines the sheet release into the delivery?
• What are the problems resulting from the excessive use of anti set off spray powder?
• What could cause printed sheets to set off in the delivery?
• How can the possibility of set off in the delivery be reduced?
• How does air blast assist sheet delivery?

Inks and additives
• What are the OHS concerns related to the preparation of inks and additives?
• What details are necessary to check inks suitability for the printing process?
• What special end-use requirements may be necessary?
• Why may it be necessary to mix an additive into the ink?
• Explain how a spectrophotometer can be used to assess the colour of ink.
• Describe the formula for calculating the correct quantity of ink in relief printing.
• What print fault will occur if excessive driers are mixed into the ink?
• What precautions do you observe to minimise waste when preparing the ink?
• What is the shelf life of most ink?
• What conditions are relevant to the storage of inks and additives?
• What conventions should be adhered to when labelling mixed inks?

Machine set up
• What are the major OHS concerns when setting up the machine?
• How much packing was required in the tympan?
• How is the amount of printing pressure determined?
• What is the ideal condition of the tympan?
• How is the correct top sheet tension achieved when fitting a new tympan?
• What print faults can occur if the tympan is not tensioned correctly?
• In what order should eccentric or concentric roller adjustments be made?
• When setting the rollers, what should be the width of the contact stripe between two rollers?
• How should you determine the ink duct setting?
• What is the ideal ink duct sweep setting?
• What is the recommended degrees shore hardness for forme rollers?
• What is the main reason for blistering on a heatset machine?
• What are the types of ink drying / curing systems?
• How does the drying unit cure the ink?

In-line processes
• What OHS precaution must be observed when slitting on the machine?
• What operations can be performed with in-line units?
• In what machine position should you engage in-line processing units?
• What precautions are necessary when setting up in-line processing units?
• What are the reasons for a printed product to be top cut?
• What are the benefits of embossing in-line?
• What would be the result of excessive pressure when top cutting?
• What would be the result of excessive pressure when cutting and creasing?
• What effect will differing tooth counts have on perforated products?

Problem solving proofing and adjustment
• Describe the operation of the true inch function fitted to some machines.
• What problems may cause the machine to keep stopping?
• What checks are necessary prior to engaging the impression?
• What checks were performed when running the machine?
• What effect will the position of certain guards have on the operation of the machine?
• How were the steps involved in operating the machine communicated to other team members?
• What aids are available for the testing of the machine proof?
• What tests are necessary for this job?
• Where should the testing take place?
• What is the function of a polarisation filter in a densitometer?
• What are the ideal conditions for inspecting the proof?
• Why is it necessary to use visual aids on the printed substrate?
• What could be the cause of a halo effect on the image?
• What methods are available to check and adjust ink colour and consistency?
• What adjustments may have caused mis-register?
• What adjustments are made to position the image laterally?
• What adjustments are made to position the image circumferentially?
• How can changing the colour sequence effect the final colour cast?
• What is the procedure to lengthen the print length on this type of press?
• What is the procedure to shorten the print length on this type of press?
• What is the difference between mechanical and optical dot gain?
• What can cause excessive mechanical dot gain?
• Who has the final say in the "OK" of the job?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
• Range of inks commonly used in 3 or more colour printing, including standard and special colours

Colour matching systems
• Use of densitometers and spectrophotometry

Machines
• Range of platen, cylinder and rotary machines with manual, semi-automated, fully automated or computerised process control

Design
• 3 or more colours, complex graphics and text. Critical "tight" registration, fit and position, registration should be at least that required for four-colour process work

In-line processes
• Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such

Substrate types
• Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal

Substrate handling
• Wide and narrow reel, and large and small sheet handling systems

Degree of autonomy
• Working independently in consultation with others

Non-routine
• Non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

• Set up reel- or sheet-fed platen, cylinder or rotary printing machines for non-routine print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained
• Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
• Demonstrate an ability to find and use information relevant to the task from a variety of information sources
• Set up a relief printing machine for complex printing on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to manufacturer's and job specifications, enterprise procedures and the Performance Criteria
• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
• reel- or sheet-fed platen, cylinder or rotary printing machine

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

• direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

• ICPPR352B Produce complex relief printed product
ICPPR452B Produce specialised relief printed product

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to produce a specialised relief printed product that requires a certain amount of problem solving and experimentation with the substrate and press settings.

Employability Skills

This unit contains employability skills.

Application of the Unit

This unit requires the individual to operate a platen, cylinder or rotary printing machine to produce a specialised printed product that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector

Printing

ELEMENT PERFORMANCE CRITERIA

1. Maintain specialised relief printing process

1.1 Relief polymer forme or plate cylinder condition is monitored, evaluated and adjusted to ensure the quality of the specialised printed product meets the standard of the sample sheet

1.2 Relief polymer impression surface condition is monitored, evaluated and adjusted to ensure the quality of specialised printed product meets the standard of sample sheet

1.3 Relief polymer inking system is monitored, evaluated and adjusted to ensure quality of specialised printed product meets the standard of sample sheet

1.4 Drying systems are monitored, evaluated and adjusted to ensure quality of specialised printed product meets the standard of approved proof
2. Maintain production process

2.1 Production process is operated in association with fellow workers and according to enterprise procedures and planned daily schedule

2.2 If required, in-line printing / converting / binding / finishing processes are monitored and adjusted to ensure quality of product meets the standard of the approved proof

2.3 Production is maintained according to OHS requirements, manufacturer's specifications and enterprise procedures

2.4 Manual and / or automatic control is used according to job specifications

2.5 Performance is monitored and verified using the process control system according to enterprise procedures

2.6 Ink performance, colour, register and position of print are monitored and adjusted throughout production run

2.7 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention

2.8 Process adjustments or alternate approaches to eliminate problems are reported according to enterprise procedures

2.9 Waste is sorted according to enterprise procedures

3. Tune and adjust machinery

3.1 Idiosyncrasies of machines are reviewed and adjustments or tuning undertaken to compensate or to exploit the idiosyncrasy, within manufacturer's specifications

3.2 Options are assessed to determine most effective / efficient method of production, ensuring highest quality and yield from machinery

3.3 A test run confirms correct options and settings or the need for further adjustment or tuning to meet quality standards

3.4 Options and recommendations are documented for future reference according to enterprise procedures

3.5 Instruction on new practices is provided to machine operator or finisher, if required

4. Troubleshoot machinery and material problems

4.1 Corrective or preventive action is recommended and implemented where appropriate

4.2 Changes are communicated to relevant personnel in a logical and easily understood manner

4.3 Changes are monitored to confirm improvement to production efficiency

4.4 Ongoing problems are reported according to enterprise procedures
5. Conduct shutdown of production process

5.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures

5.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements

5.3 Unused ink is correctly labelled and stored according to manufacturer's / supplier's specifications and enterprise procedures

5.4 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures

5.5 All product is removed from operating area

5.6 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures

5.7 Repair / adjustment is verified prior to resumption of operations
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

**Required skills:**

The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by providing feedback to internal and external clients about printing processes and job specifications
- Collecting, analysing and organising information by interpreting machine feedback to ensure specialised product requirements are achieved
- Planning and organising activities by determining the most effective processes to produce a specialised printed product
- Teamwork when working with others to maintain the production process
- Mathematical ideas and techniques by calculating consumables and personnel requirements to meet production schedules
- Problem-solving skills by identifying print problems and correcting during print run to produce a specialised printed product
- Use of technology by using machinery to the full extent of its capacity to produce specialised printed product

**Required knowledge:**

The following knowledge must be assessed as part of this unit:

**Reel transportation and web control**

- What are the major OHS concerns when setting up the reel transportation system?
- What could cause the reel to wander?
- What could cause the web to break at the unwind unit?
- What print fault would result from the reel being run out of centre?
- What possible faults in the unwind section could cause a web break?

**Sheet transportation and transfer at the feeder**

- What are the major OHS concerns when setting up the sheet transportation system?
- What would be result of worn suckers at the feeder suction head?
- What type of two-sheet detection is on this machine?
- How much movement should the sheet have when being registered by the side lay?
- What could cause mis-register of the sheet at the feeder?
- What are the visible signs of the sheet being registered in the feeder?
- How can gripper malfunction affect sheet control and transfer?
- When would sheet transfer mechanisms require adjusting?
- What would cause the feeder stack to become uneven?
- What would be the result of the feeder stack not being loaded level?
- How can any unevenness of the feeder stack be rectified?

**Reel delivery for rewinding and sheeting**

- What are the OHS risks associated with rewinding and sheeting?
- What safety feature is in the delivery system if the web jams up?
- Why would the sheet cut-off wander?
- What is the effect of poorly adjusted nip rollers when rewinding and sheeting?

**Sheet delivery**
• What effect will machine speed have on sheet delivery?
• What is the advantage of spraying moving sheets with anti set off powder in the delivery?
• What items in the delivery could cause marking of the printed image?
• What remedial steps may be necessary to eliminate marking of the printed image?
• What faults could result from incorrectly set grippers in the transfer section of a machine?
• What devices were adjusted to maintain sheet control in the delivery?

Printing unit
• What could be the result if the plate lifts at the grip edge during a print run?
• How could a build-up of ink on the impression cylinder affect the printed product?
• What could cause the ink to lie back in the duct?
• How could the problem of paper surface picking be rectified?
• What could cause diminished impression during the print run?
• What could cause the plate surface to prematurely wear during production?

Drying unit
• Why is it not advisable to eat or drink near the machine when using UV inks?
• What is the link between driers and set off and marking?
• What causes UV ink to dry?
• What could cause the substrate to blister?
• What is the effect of incorrect drying temperature on the finished product?

Maintaining specialised production process
• What is the effect of inadequate communication within the work team on a relief printing machine?
• What safety features within the organisation aid in maintaining effective production?
• What are the ramifications if machine guards are removed and / or micro switches are disconnected on a machine?
• Who would be held legally responsible for the removal of machine guards and / or disconnection of micro switches?
• What other measurement besides optimum solid ink density can be measured to assess print quality?
• What is the most accurate method of checking register during a production run?
• Why is it necessary to take immediate action when production problems are anticipated?
• What action is taken to eliminate further processing of unacceptable printed product?
• How will a stack of paper be affected if the relative humidity is increased in the press room?
• What is the procedure to care for a newly delivered skid of paper to the press room?
• Why should waste be sorted?
• What is the advantage of keeping reusable waste?

Client liaison
• What industry standards can be applied to enhance effective communication with the client?
• What are the necessary procedures that the client should follow to "OK" a printed product?

Relief printing machine operating problems
• When would it be necessary to call service personnel to correct a machine problem?
• What enterprise procedures are in place to report any machine operating problems?
Shutdown procedures

- What would be the result if correct shutdown procedures were not followed?
- Why is it necessary that correct shutdown procedures be conducted with fellow workers?
- What advantages result from proper labelling and storage of excess inks and materials?
- Why should the printed product be clearly labelled prior to removal from the press room?

Completing production records

- How are completed records used in the final analysis of the job?
- What are the benefits of comprehensive records when considering the production of future jobs?

Information sources

- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?
- What other sources of information are available?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

- Inks / coatings
  - Range of inks commonly used in 3 or more colour printing, including standard and special colours

- Colour matching systems
  - Use of densitometers and spectrophotometry

- Machines
  - Range of platen, cylinder and rotary machines with manual, semi-automated, fully automated or computerised process control

- Design
  - 3 or more colours, complex graphics and text. Critical "tight" registration, fit and position, registration should be at least that required for four-colour process work

- In-line processes
  - Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such
Substrate types

- Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal

Substrate handling

- Wide and narrow reel, and large and small sheet handling systems

Degree of autonomy

- Working independently in consultation with others

Specialised

- Specialised within this context relates to the set up and production of print runs that involve new products, or a new mix of substrates and inks that requires a certain amount of problem solving and experimentation with the substrate and press settings. The set up of equipment and production involves the development of new set up and production approaches based on solving technical problems arising from new product or equipment combinations

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Operate a platen, cylinder or rotary printing machine to produce a specialised printed product that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Monitor production output and make necessary adjustments to maintain print quality on a relief printing machine whilst producing a specialised print on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to job specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity
**Context of and specific resources for assessment**

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- platen, cylinder or rotary printing machine

**Method of assessment**

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR352B Produce complex relief printed product
- ICPPR451B Set up for complex relief printing
**ICPPR471B Set up for complex coating**

**Unit Descriptor**
This unit describes the performance outcomes, skills and knowledge required to set up for non-routine coating.

**Employability Skills**
This unit contains employability skills.

**Application of the Unit**
This unit requires the individual to set up rollers and the reel or sheet systems for coating a range of carbon, carbonless, latex, wax, resin and metallic coatings, aqueous and UV varnishes and machine varnishes. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.

**Unit Sector**
Printing

**ELEMENT** | **PERFORMANCE CRITERIA**
---|---
1. Confirm job specifications  | 1.1 Job requirements are read and interpreted from job documentation or production control system  
|  | 1.2 Set up is planned and carried out correctly and in minimum time  
|  | 1.3 Availability of all job related components is checked  
2. Set up reel system (OR Element 3)  | 2.1 Unwind set up and adjusted according to job specifications  
|  | 2.2 Webbing procedures are carried out and web-control system is set up and adjusted according to job specifications  
|  | 2.3 Reels are spliced / joined according to job specifications  
|  | 2.4 Printed web viewing devices are set up and adjusted according to job specifications  
|  | 2.5 Set off / marking prevention devices are set up and adjusted according to job specifications  
3. Set up sheet system (OR Element 2)  | 3.1 Feeder and delivery is set up and adjusted according to job specifications  
|  | 3.2 Sheet pick-up and transportation system is set up and adjusted according to job specifications  
|  | 3.3 Transfer and control systems are set up and adjusted according to job specifications  
|  | 3.4 Substrate is added to and removed from process according to job instructions  
|  | 3.5 Set off / marking prevention devices are set up and adjusted according to job specifications
4. Select and prepare coating

4.1 Coating is selected according to job specifications and end-user requirements

4.2 Quality and suitability of coating is checked and appropriate action is taken

4.3 Coatings and additives are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste

4.4 Correct weight / volume of coating is prepared to match the requirements of the job specification and the coating process

4.5 Check the viscosity of coating is correct for the job

4.6 Formulation of the coating is appropriately recorded

5. Set up machine for coating

5.1 Appropriate rollers / cylinders are selected and secured to the machine and set

5.2 Application system is set up and adjusted according to job specifications

5.3 Choose appropriate anilox roller and ensure it is installed to manufacturer's specifications

5.4 Set doctor blades to manufacturer's specifications

5.5 Coating delivery system is set up with correct flow and return flow determined by air pressure or pump speeds and adjusted according to job specifications

5.6 Cut a coating blanket or install a plate for non-image areas

5.7 Check that blanket or plate packing is suitable to the job

5.8 Check that the coating temperature is suitable for the job

5.9 Drying system is set up and adjusted according to job specifications

6. Conduct proof run

6.1 Material to be used for proof is organised correctly

6.2 Machine is set up and operated, and roller and pressure settings are checked, to produce a specified proof according to OHS requirements, manufacturer's specifications and enterprise procedures

6.3 Proof is visually inspected and / or tested or laboratory testing organised according to enterprise procedures

6.4 Production does not commence without client OK or authority where appropriate

6.5 Results are interpreted and adjustment changes are carried out according to product and machine specifications to determine adjustment requirements
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting the job brief and providing advice to internal and external clients about options and limitations
- Collecting, analysing and organising information by collecting and analysing data about coating process, machine specifications and performance to calculate appropriate adjustments for the job
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when cooperating with other workers and coordinating the production unit to ensure efficient operation
- Mathematical ideas and techniques by calculating substrate requirements, plate or blanket position, and pressures
- Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
- Use of technology by using monitoring equipment and computerised production records

Required knowledge:
The following knowledge must be assessed as part of this unit:

Interpreting job specifications
- Where on the work ticket is the information listing the type of coating required?
- What would you do if vital information were missing from the job ticket?
- What checks should be undertaken prior to set up (availability of materials etc)?

Sheet or reel transportation
- What are the major OHS concerns when setting up the sheet or reel transportation system?
- How is the coating side of the material chosen?
- What would be the effect of low web tension on the print?
- What is the effect of inefficient web splices?
- How was the sheet or reel position determined for the job?
- What effect does side lay selection have on the job?
- How would the appropriate front lays be selected?
- How would a register check be carried out?
- Why is a two-sheet cut out used on most feeders (sheet)?
- How does the machine know if a sheet is missing or late?
- How does the machine know if there has been a web break?

Sheet or reel delivery
- List THREE safety risks associated with the rewind of the machine.
- What would be the effect of excessive web tension at the rewind of the machine?
- What effect will too much vacuum on the slow-down wheels have on the job?
- What determines the position of register or bustle wheels?
- What effect would excessive jogging have on the stack?

Coating preparation
• What OHS concerns are relevant to the use of coatings?
• List FOUR types of coatings and their applications.
• How is the suitability of the coating determined for the job?
• How is the ability of the coat to adhere to the product determined?
• How do you determine the amount of coating required?
• What range of viscosities should you run with on an aqueous coating?
• What is the effect of incorrect viscosity on coating?
• How do you adjust the viscosity of a coating?

**Machine set up**

• What methods does the coating use to solidify?
• What is required to dry UV coating?
• What printing principle is being utilised to apply aqueous coating?
• Why is it important that gluing tabs are not coated?
• What temperature is the drier set at to dry aqueous coating?
• How do you determine which image carrier (plate or blanket) to use?

**Proofing and adjustments**

• How is the position of the coating checked against the print?
• What effect could skeleton wheels have on the surface of the coating?
• How can the amount of gloss on the surface be measured?
• Who is responsible for the final "OK" on the job?
• What effect do you get when you don't have enough coating on a sheet?
• What effect would a UV coating have on a wet print?
• What effect would excessive temperature have on the sheet?
• What effect would you get if the viscosity were too high or too low?
• What effect would you get if ink coverage were excessive, ie over 250%?

**Information sources**

• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?

**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

**Coatings**

• A range of carbon, carbonless, latex, wax, resin and metallic coatings, aqueous and UV varnishes and machine varnishes

**Colour matching systems**

• Use of visual colour assessment and densitometry to match basic standard tints under controlled lighting conditions
Machines

• A range of dedicated coating machines with manual, semi-automated, fully automated or computerised process control

Design

• Spot coating, overall coating and fine detail coating

In-line processes

• Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such

Substrate types

• Full range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal

Substrate handling

• Narrow or wide reel handling, and small and large sheet systems

Degree of autonomy

• Working independently consulting as required
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Set up rollers and the reel or sheet systems for coating a range of carbon, carbonless, latex, wax, resin and metallic coatings, aqueous and UV varnishes and machine varnishes. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
- Set up for THREE complex coating operations (one spot coating, one overall coating and one fine detail, using THREE different coatings of which one must be metallic) and if possible including at least ONE in-line process) according to manufacturer's and job specifications, enterprise procedures and the Performance Criteria.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
- dedicated coating machine

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR472B Produce complex coated product
ICPPR472B Produce complex coated product

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to produce complex coated product.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to produce a complex coated product on either a reel- or sheet-fed machine ensuring an efficient production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines.

Unit Sector
Printing

**ELEMENT** | **PERFORMANCE CRITERIA**
--- | ---
1. Maintain operation of reel system (OR Element 2) | 1.1 Reel stand and rewind section are monitored and adjusted to maintain correct tension and to ensure no marks or blemishes to finished product and to ensure efficient continuous operation
| 1.2 Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation
| 1.3 Substrate is added to and removed from process according to job instructions
| 1.4 Sheeting section is monitored and adjusted to ensure quality and efficient product delivery

2. Maintain operation of sheet system (OR Element 1) | 2.1 Feeder and delivery is monitored and adjusted to ensure continuous and efficient feeding to machine
| 2.2 Sheet pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operation
| 2.3 Transfer and control systems are monitored and adjusted to ensure correct and continuous sheet handling and efficient operation
| 2.4 Substrate is added to and removed from process according to job instructions

3. Maintain coating process | 3.1 Roller condition is monitored and adjusted to ensure the quality of printed product meets the standard of approved proof
| 3.2 Coating system and doctor blade condition (if appropriate) are monitored and adjusted to ensure quality of product meets the standard of approved proof
| 3.3 Drying systems are monitored and adjusted to ensure quality of product meets the standard of approved proof
| 3.4 Quality and viscosity of varnish coatings are monitored and adjusted as necessary to ensure quality of product
4. Maintain production process

4.1 Basic or complex in-line printing / converting / binding / finishing processes are monitored and adjusted to ensure quality of product meets the standard of the approved proof.

4.2 Production process is operated in association with fellow workers and according to company specifications and planned daily schedule.

4.3 Production is maintained within OHS requirements and company and manufacturer's specifications.

4.4 Manual and / or automatic control is used as per specification.

4.5 Performance is monitored and verified using the process control system according to enterprise procedures.

4.6 Coating performance, register and position of coating are monitored and adjusted throughout production run.

4.7 Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention.

4.8 Process adjustments to eliminate problems are reported according to enterprise procedures.

4.9 Waste is sorted according to enterprise procedures.

5. Identify and rectify problems

5.1 Faulty performance of equipment is identified and reported according to enterprise procedures.

5.2 Problems in coating machine are identified and reported according to enterprise procedures.

5.3 Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level.

5.4 Coating machine operation is checked to ensure correct operation.

6. Conduct shutdown of production process

6.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures.

6.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements.

6.3 Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures.

6.4 All product is removed from operating area.

6.5 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures.

6.6 Repair / adjustment is verified prior to resumption of operations.
7. Clean and wash up coating machine at end of print run

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Cylinders, plate and roller surfaces are cleaned ready for next run</td>
</tr>
<tr>
<td>7.2</td>
<td>Coating delivery system is washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements</td>
</tr>
<tr>
<td>7.3</td>
<td>In-line slitting units are cleaned ready for next run</td>
</tr>
<tr>
<td>7.4</td>
<td>Reef feed, transportation and delivery systems are disengaged and cleaned ready for next run</td>
</tr>
<tr>
<td>7.5</td>
<td>Production records or other documentation are accurately completed where required by enterprise procedures</td>
</tr>
</tbody>
</table>
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by providing feedback to internal and external clients about printing, in-line processes and job specifications
• Collecting, analysing and organising information by collating details of job and machine specifications and coating processes to ensure efficient production
• Planning and organising activities by coordinating sequences for coating and wash-up
• Teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production
• Mathematical ideas and techniques by calculating consumables and personnel requirements to meet production schedules
• Problem-solving skills by identifying coating problems and correcting during print run
• Use of technology by using monitoring systems, understanding their output and feeding into production management systems

Required knowledge:

The following knowledge must be assessed as part of this unit:

Interpreting job information

• What would you do if vital information was missing from the job ticket?
• What checks should be undertaken prior to set up (availability of materials etc.)?

Reel or sheet transportation and delivery

• What OHS concerns are there related to loading and handling heavy reels?
• Why are the sheets fanned before loading into the press?
• Why is it important that the double sheet detector be set and checked during the print run?
• What would be the effect on the print of excessive tension on the rewinding reel?
• What will happen if the web is not spliced correctly?
• What precautions should be taken to ensure that the rewound product is of consistent acceptable quality?
• If sheeted, what components can be adjusted to ensure correct delivery?
• How is printed material that is not of an acceptable standard identified?

Maintaining coating operations

• What are the major OHS concerns when coating?
• What action could be taken if the aqueous coating was smudging on the delivery section of the machine?
• What effects could anti set off spray have on the finished job?
• At what level should the coating be maintained in the pan?
• What effect does the UV lamp have on the UV coating?
• When would the temperature and volume of hot and cold air knives be varied?
• When is IR radiation used (including choice of medium or short wave lamps) and what is its effect when using coatings?

Wash-up and shutdown of machine
• What dangers exist from solvents and solutions used to clean the coating system, plates, cylinders and the press?
• What parts of the machine should be thoroughly cleaned following the coating of the job?
• What components are to be inspected for wear following the print run?
• What records are important for following or repeat prints?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Coatings
• A range of carbon, carbonless, latex, wax, resin and metallic coatings, aqueous and UV varnishes and machine varnishes

Colour matching systems
• Use of visual colour assessment and densitometry to match basic standard tints under controlled lighting conditions

Machines
• A range of dedicated coating and printing machines with manual, semi-automated, fully automated or computerised process control

Design
• Spot coating, overall coating and fine detail coating

In-line processes
• Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (eg flat-bed cutting, folding) it should be assessed as such

Substrate types
• Full range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal
Substrate handling
  • Narrow or wide reel handling, and small and large sheet systems

Substrate handling
  • Working independently consulting as required

**EVIDENCE GUIDE**

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

**Critical aspects for assessment and evidence required to demonstrate competency**

Evidence of the following is essential:

- Produce a complex coated product on either a reel- or sheet-fed machine ensuring an efficient production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Produce THREE complex coating jobs (one spot coating, one overall coating and one fine detail, using THREE different coatings one of which must be metallic and if possible including at least ONE in-line process) according to job specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

**Context of and specific resources for assessment**

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- a print machine or a dedicated coating machine
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR471B Set up for complex coating
ICPPR481B
Unit Descriptor
Set up and produce complex digital print
This unit describes the performance outcomes, skills and knowledge required to set up and produce digital print in a complex print production environment.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to identify productivity options for digital print systems and be able to communicate these effectively to clients. The individual is required to set up either reel- or sheet-fed digital printing systems, access electronic data, conduct a proof run, supervise a print run and maintain and adjust machine settings to ensure production speeds and quality are achieved.

This competency is best applied in the commercial print, pre-press, bureau, high-end digital print or a combination of any of these business environments.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Liaise with clients
   1.1 A productivity analysis on a digital print system is performed including production speeds for a range of print volumes and substrate types, quality standards, cost of labour, materials, maintenance and servicing, for both print systems to determine guidelines for most productive print method for a range of print applications
   1.2 Print services, quality expectations and print costings are communicated to clients according to enterprise procedures
   1.3 Productivity advantages and disadvantages of different digital print options are presented to clients according to enterprise procedures
   1.4 Advice is provided to clients on appropriate substrates and document finishing methods for digital print jobs according to client budget and job specifications

2. Confirm job specifications
   2.1 Print job specifications are read and correctly interpreted from job documentation or production control system
   2.2 Availability of all job components is checked according to enterprise procedures
   2.3 Finishing requirements of job are confirmed and coordination with internal workflow and / or outsource arrangements is maintained
   2.4 Run time of job is determined and completion time is correctly estimated demonstrating consideration of other production demands
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<tbody>
<tr>
<td><strong>3. Set up and maintain a digital print system</strong></td>
<td>3.1 Substrate is loaded to correct web or sheet feeding mechanism and all substrate properties are correctly specified in the user control interface</td>
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<td></td>
<td>3.2 Delivery unit is set up on a machine and adjustments made to minor in-line processes on web-fed machine or on-line finishing settings on sheet-fed machine</td>
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<td>3.3 Preventive maintenance is performed on a digital printing system to ensure optimum quality and productivity are achieved</td>
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<td></td>
<td>3.4 The common factors affecting print quality and productivity of a digital printing machine are identified and solutions implemented to minimise and / or eliminate these</td>
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<tr>
<td><strong>4. Access and verify data</strong></td>
<td>4.1 A workstation computer and industry software are used to locate and retrieve electronic data files according to job specifications</td>
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<td></td>
<td>4.2 Preview or pre-flight check of electronic data files is performed to verify correct job set up according to job specifications</td>
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<td></td>
<td>4.3 Problems associated with software and hardware versioning are identified, resources located and solutions to incompatibilities between versions of hardware and software used in digital printing are provided</td>
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<td></td>
<td>4.4 Troubleshooting methods are applied to identify unverified data files, file errors and job requirement inconsistencies</td>
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<td></td>
<td>4.5 Solutions are implemented to rectify errors according to manufacturer’s specifications</td>
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<tr>
<td><strong>5. Submit data files to a digital print system</strong></td>
<td>5.1 Key data file information is identified</td>
</tr>
<tr>
<td></td>
<td>5.2 Most productive data file submission workflow is selected and documented based on data file format, quantity and file size and document finishing</td>
</tr>
<tr>
<td></td>
<td>5.3 Job priority is determined according to job specifications and production schedules</td>
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<tr>
<td></td>
<td>5.4 Print driver and / or job download software are correctly installed and set up on workstation computer and / or digital front-end processor</td>
</tr>
<tr>
<td></td>
<td>5.5 Manufacturer’s installation instructions are located and / or software installation is coordinated according to enterprise procedures</td>
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<tr>
<td></td>
<td>5.6 Data file is submitted to print and image quality and machine productivity checks are performed and adjustments made to correct any problems</td>
</tr>
</tbody>
</table>
6. Perform and / or coordinate document proofing

6.1 The type of proofing method is determined according to job specifications eg press proof, chemical proof, digital proof

6.2 A digital proof run is conducted for client approval and conformance of proof to job specifications is confirmed

6.3 Liaise occurs with internal or external pre-press proofing systems operators to conduct the proof run and provide job requirement information according to enterprise procedures

6.4 Demonstrate ability to communicate between the client and proofing provider to ensure proof meets job specifications

7. Run digital print job and / or coordinate press print run

7.1 Production schedules, job specifications and enterprise procedures are observed and liaison occurs with internal and / or external production operators to determine start and duration time for the print run

7.2 Completion time for the print run is estimated and communicated to the client and co-workers according to job specifications and enterprise procedures

7.3 An entire digital print run is conducted according to job specifications ensuring that machine productivity and quality are monitored and rectified throughout the duration of the print job
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by interpreting client requirements to recommend most productive method of printing
• Collecting, analysing and organising information by collecting and assessing data on printing processes to determine time and cost savings to a client
• Planning and organising activities by suggesting production sequences to maximise efficiency
• Teamwork when cooperating with external production providers and giving consideration to their production scheduling requirements
• Mathematical ideas and techniques by calculating run length time of two different print solutions to determine most productive method
• Problem-solving skills by recognising electronic file errors to determine a file conversion procedure
• Use of technology by using digital scanning technology to input document files for printing

Required knowledge:

The following knowledge must be assessed as part of this unit:

Analyse and recommend printing solutions

• What are the factors that influence making a decision about using a particular printing solution? (Run length, substrate type, application)
• What would be the cost difference between a specified job printed on a digital system and a specified traditional system? (Eg digital vs. lithographic)
• What would be the quality difference between a specified job printed on a digital system and a specified traditional system? (Eg digital vs. lithographic)
• What would be the difference in turnaround time of a specified job printed on a digital system and a specified traditional system? (Eg digital vs. lithographic)
• Which print method would be the most appropriate option for the specified print job?

Communication and Client Interaction

• What measures can be taken to ensure clients have correct procedures for providing electronic files?
• How would you explain the main differences between digital printing and traditional printing methods?
• What recommendations can you make to a client who has created an electronic file in an incompatible software application?
• What suggestions could you make to a client who required a high volume print run but needed a portion of the print job immediately?
• What steps would need to be followed for a client approval of a proof?

Job requirements and processing systems

• What would you do if vital information was missing from the job ticket (manual or electronic)?
• What checks were undertaken prior to set up? (Availability of material, maintenance etc.)
• If a file does not transfer correctly what action should be taken to correct the problem?
What are the main points to be checked before submitting an electronic file to print?

Data access and manipulation
- What checks are made to ensure the data is in a format that can be used in digital print?
- What suggestions could you make to a client who has incompatible version of software?
- What are the ways to submit a PDF file to the digital printer?
- What would you do if you could not access an electronic data file using industry software?

Substrate transportation, in-line and on-line processes
- What would you do if the required substrate were unavailable?
- What is the maximum and minimum weight of substrates that can be printed on a specific machine?
- What are the possible faults associated with printing on lightweight paper?
- What is the maximum delivery quantity for the machine?
- What are the possible problems with incorrect feeding and delivery?

Basic document scanning
- In what situation would you digitally scan a document for input rather than create an electronic file?
- What is OCR scanning?
- How does scan resolution effect document size and quality?
- What could you do if a scanned image was too dark?
- What sort of scanner hardware and software configuration could be used to digitally scan a hard copy multi page document with text and images?

Proofing and adjustment
- Under what circumstances would a job be modified before printing?
- Why would margins be changed when the job reaches the printer?
- What steps would need to be followed for a client approval of the print?
- What is the proof checked against?
- What types of proofing systems are available in the traditional pre-press production environment?
- What recommendations could you make with regards to an appropriate proofing system to be used for a specified print job?

Document finishing and client delivery
- What are the various types of binding?
- What procedures would you follow if the binding method required by the client was not available at your site?
- What options could you suggest if the document size was too thick to staple?
- Why is packaging finished print work important?

Information Sources
- What machine manuals, safety and other documentation are relevant to this task and where are they kept?
- What information is included in these documents?
- What other sources of information can you identify?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inking Systems
- Range of toners commonly used in 2 colour printing, including special colours

Colour Matching Systems
- Use of visual colour assessment and matching under controlled lighting conditions

Machines
- Range of non-impact printing machines including inkjet and laser with or without colour manipulation capability, and including machines with computerised monitoring and / or control

Design
- Simple graphics and text. Minor variation in registration position

In-line processes
- Minor in-line processes such as perforating, numbering, date coding, imposition, that do not constitute another defined unit of competency. Major in-line process is defined as a separate competency eg flat-bed cutting, folding etc)

Substrates
- Range of print media and paper

Degree of autonomy
- Working to defined procedures under limited supervision

User replaceable consumables
- Consumables required to be changed by an individual if damaged or reached expiry. Used by a range of printing machines for correct functioning. Ink, toner, developer, waste toner, cleaning web, fuser, substrates

User control interface
- Computerised monitoring and data entry device used to enter machine default settings, job specification settings, monitor machine status and perform machine productivity enhancements

Registration mechanisms
- Mechanical and / or electronic controls used to adjust substrate position throughout substrate feeding and transport units of a range of printing machines
Calibration

- Mechanical and / or electronic and / or visual controls used to identify and correct ink coverage and density inconsistencies in a range of printing equipment

Digital front-end

- Proprietary computer processor hardware and software required to interpret electronic data files and convert to print-ready data

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Demonstrated ability to communicate a range of digital and traditional printing solutions
- Organisation skills to coordinate a print run that uses a combination of digital and traditional printing solutions
- Access and submit electronic data to a digital printer. Conduct a digital proof run. Adjust settings and ensure production speeds are attained on a digital printer
- Perform preventive maintenance tasks on digital printer to maintain machine productivity
- Demonstrate use of computerised control and monitoring systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Perform preventive maintenance tasks on a digital printer according to manufacturer's specifications
- Prepare a written document outlining production workflow methods for TWO print jobs using the following job specifications within a specified production environment for
  - One-colour business cards; black and a specified PMS colour; quantity: 500; finishing: guillotined; packaging: wrapped; turnaround time: 7 days
- For valid and reliable assessment of this unit, evidence should be gathered over a period of time through a range of methods for assessment to indicate consistent performance
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity
Context of and specific resources for assessment

Assessment must ensure:
• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
• a digital printing machine and a digital front end

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:
• direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:
• ICPPR281B Set up and produce basic digital print
• ICPPR282B Produce and manage basic digital print
ICPPR484B Prepare for variable data printing

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to confirm data requirements and prepare and link data to a template ready for printing.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to use a database requiring sophisticated variable data fields and a complex page layout with multiple static and variable elements, both text and graphics, for producing customised print runs.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Confirm data requirements
   1.1 The job specifications are reviewed to identify document purpose
   1.2 Materials required for page design, layout and content are identified from job specifications
   1.3 Source and format of data is determined and confirmed
   1.4 The page design template is evaluated for printing purposes and static and variable fields are correctly understood and labelled
   1.5 Responsibility for data accuracy and other tests such as spell checks and postal software is agreed with client

2. Prepare data
   2.1 Data required to populate the copy holes in the variable-data template is established
   2.2 The fields to be populated are confirmed and linked to data required to markup the copy holes in the variable-data template
   2.3 A composition engine is used to achieve the required data format and page layout requirements for merging variable data and static elements
   2.4 Business rules are developed to reduce data errors and discrepancies
   2.5 If possible, a sample of the data is obtained and preliminary checks run, making sure the data and format is correct
   2.6 A soft proof is performed to ensure the quality of all static and variable elements
   2.7 If high variability, RIPped data is spooled prior to printing to maintain higher engine speeds
   2.8 A sample from the machine is produced and checked for conformance to the job specifications
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by determining and confirming source and format of data in consultation with the client
• Collecting, analysing and organising information by evaluating the page design template and correctly labelling static and variable fields
• Planning and organising activities by confirming data requirements before developing business rules
• Teamwork when maintaining the production process in association with others
• Mathematical ideas and techniques by assessing the output rate of the printing equipment
• Problem-solving skills by developing a soft proof to ensure the quality of all static and variable elements
• Use of technology by using relevant hardware and software to prepare for variable digital printing

Required knowledge:
The following knowledge must be assessed as part of this unit:

• PPML / VDX, XML
• Privacy legislation
• Database operation
• Knowledge of data mining

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Job specifications
• Job sheets, batch processing orders, job specs

Quality
• Efficiency, quality and output rate

Composition engine
• DL Formatter, Autograph Series, DL Pager, Calligramme, DL Composer

Variable fields
• Text, images, layout, with flexible placement

Markup
• PPML / VDX, XML
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Use a database requiring sophisticated variable data fields and a complex page layout with multiple static and variable elements, both text and graphics with flexible placement
- Confirm data requirements and prepare data and link it to a template ready for printing on TWO different jobs
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- Assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- Relevant computer hardware and software

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- Direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPP385B Operate a database for digital printing
- ICAB4135B Create a simple mark-up language document to specification
ICPPR491B Use on-press monitoring of print quality

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to use computerised print quality monitoring devices.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to select computerised settings to set up and run a press to acceptable tolerances and to monitor quality both electronically and visually during the run, and to make adjustments to maintain print quality. Additional adjustments to the specifications may be made during the run and adjustments made to suit.

Unit Sector
Printing

**ELEMENT** | **PERFORMANCE CRITERIA**
--- | ---
1. Set up monitoring device | 1.1 CIP3 / CIP4 data, or equivalent, is used to create a profile
 | 1.2 Job is made ready to achieve position, register and fit to the specified standards
 | 1.3 Colour is made ready to match appropriate colour standards
 | 1.4 Data is interpreted and appropriate adjustments made to gain approval to run press

2. Run press to specified standards | 2.1 Print is inspected visually to meet specified standards during run
 | 2.2 Data is analysed against the required standards
 | 2.3 Appropriate adjustments are made to maintain consistency throughout run
 | 2.4 At regular intervals monitor and maintain job to ensure quality
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by communicating specifications for colour profiles and pre-press requirements for printing to clients
• Collecting, analysing and organising information by collating and integrating information on colour profiles and press performance
• Planning and organising activities by establishing sequence of monitoring to ensure quality output
• Teamwork when integrating job planning with pre-press
• Mathematical ideas and techniques by understanding and applying colour profiles and curves to machine adjustment
• Problem-solving skills by monitoring samples and adjusting equipment as necessary
• Use of technology by efficiently using monitoring systems to ensure quality output

Required knowledge:
The following knowledge must be assessed as part of this unit:

Colour theory

• Explain colour theory of additive colours (light), RGB.
• Explain colour theory of subtractive colours (pigments), CMYK.
• Explain relationship between ranges of visual colour RGB and CMYK.
• What is ICC profiling?
• What is the underlying principle of densitometry?
• What is the underlying principle of spectrophotometry?
• What are the basic underlying principles for determining tolerance in densitometry and spectrophotometry?
• What determines an original colour bar?
• How do you determine the accuracy of the elements in a colour bar?
• What do you look for to ensure consistent print quality output?
• How do you recognise colour contamination?
• How do you set alarm limits for colour contamination?

Integration of pre-press and press data

• What do you need to do to access data?
• How do you determine that data is appropriate?

Sampling and problem solving

• How often do you need to sample to ensure consistency?
• What processes would you put in place if sample varies from standard?
• Identify FIVE ways quality can vary and how they can be fixed.
• Explain how the computerised functions work and list common faults and why electronic registration systems fail.

Relationship between pre-press and printing

• What information do you need from pre-press to ensure quality product?
• What information do you need to give to pre-press to ensure quality product?
Registration

- What do the terms registration, fit, position and alignment mean?
- Explain the importance of registration marks.

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Quality standards

- CIP3 and CIP4

Monitoring systems

- Built-in or add-on or stand alone systems including:
  image control. Electronic colour management eg densitometry, colour imagery, Komori system, spectrophotometry

Electronic data transfer

- Press management systems such as Prepress Interface, PECOM

Plates

- Colour bars must be original

Presses

- Press must be aligned to recognised colour standard

Specified standards

- May be defined by enterprise / operator or default tolerances, client requirements, colour tolerances, industry standards
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

• May be defined by enterprise / operator or default tolerances, client requirements, colour tolerances, industry standards
• Demonstrate an ability to find and use information relevant to the task from a variety of information sources
• Set up and align monitoring device to appropriate standards on THREE occasions
• Produce profiles of samples taken during THREE different print runs that show print production is within agreed tolerances, if possible using different variables
• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
• a computerised printing machine

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

• direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

• this unit is an additional skill to most printing units and may be assessed at the same time
ICPPR492B Use on-press print control devices

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to use computerised on-press print control devices.

Employability Skills

This unit contains employability skills.

Application of the Unit

This unit requires the press operator to access or input print quality data and to perform adjustments to match the proof and maintain print quality throughout the run.

Unit Sector

Printing

ELEMENT PERFORMANCE CRITERIA

1. Set up print control devices

1.1 CIP3 / CIP4 data is accessed for the next print run OR
1.2 Data is pre-set and options / parameters selected according to the next job specifications
1.3 Data is released to press according to manufacturer's recommended procedure
1.4 Accurate position and fit are attained
1.5 Approximate colour, density and ink / water balance if applicable are attained
1.6 Make ready sheets are scanned or corrections are inputted until the print matches the proof or the client's requirements
1.7 Client or supervisor's approval is obtained prior to running the job

2. Maintain print quality throughout the run

2.1 Print quality is continuously monitored visually
2.2 Sheets are scanned to verify visual assessment
2.3 Any correctional data is released to maintain print quality

3. Maintain equipment

3.1 Maintenance tasks are performed according to the operator's manual
3.2 Equipment is calibrated according to the operator's manual
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by communicating specifications for colour profiles and pre-press requirements for printing to clients
• Collecting, analysing and organising information by collating and integrating information on colour profiles and press performance
• Planning and organising activities by establishing sequence of monitoring to ensure quality output
• Teamwork when integrating job planning with pre-press
• Mathematical ideas and techniques by understanding and applying colour profiles and curves to machine adjustment
• Problem-solving skills by monitoring samples and adjusting equipment as necessary
• Use of technology by efficiently using monitoring systems to ensure quality output

Required knowledge:
The following knowledge must be assessed as part of this unit:

Colour theory
• What is ICC profiling?
• What is the underlying principle of densitometry?
• What is the underlying principle of spectrophotometry?
• What are the basic underlying principles for determining tolerance in densitometry and spectrophotometry?
• What determines an original colour control strip?
• How do you determine the accuracy of the elements in a colour control strip?
• What do you look for to ensure consistent print quality output?
• How do you recognise colour contamination?
• How do you set alarm limits for colour contamination?

Sampling and problem solving
• How often do you need to sample to ensure consistency?
• What processes would you put in place if sample varies from standard?
• Identify FIVE ways quality can vary and how they can be fixed.
• Explain how the computerised functions work and list common faults and why electronic registration systems fail.

Relationship between pre-press and printing
• What information do you need from pre-press to ensure quality product?
• What information do you need to give to pre-press to ensure quality product?

Registration
• What do the terms registration, fit, position and alignment mean?
• Explain the importance of registration marks.
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Quality standards

- CIP3 and CIP4

Monitoring systems

- Built-in or add-on or stand alone systems including: image control. Electronic colour management eg densitometry, colour imagery, Komori, spectrophotometry

Electronic data transfer

- Press management systems such as Prepress Interface, PECOM

Plates

- Colour bars must be original

Presses

- Press must be aligned to recognised colour standard

Specified standards

- May be defined by enterprise / operator or default tolerances, client requirements, colour tolerances, industry standards

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Select computerised settings to ensure set up and run a press to acceptable tolerances and to monitor quality during the run and make adjustments to maintain print quality
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Set up and align monitoring device to appropriate standards on THREE occasions
- Produce profiles of samples taken during THREE different print runs that show print production is within agreed tolerances, if possible using different variables
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity
Assessment must ensure:
- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- a computerised printing machine

Method of assessment
A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:
- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:
- this unit is an additional skill to most printing units and may be assessed at the same time.
ICPPR493B Set up and monitor in-line printing operations

**Unit Descriptor**

This unit describes the performance outcomes, skills and knowledge required to set up and monitor in-line printing operations.

**Employability Skills**

This unit contains employability skills.

**Application of the Unit**

This unit requires the individual to set up either a reel- or sheet-fed machine that incorporates one or a number of defined in-line operations. The individual will conduct a proof run and adjust settings to ensure acceptable production speed and quality are attained and maintained.

**Unit Sector**

Printing

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Confirm job specifications | 1.1 Job requirements are read and interpreted from job documentation or production control system  
1.2 Set up is planned and carried out correctly in minimum time and with minimum wastage  
1.3 Availability of all job related components is checked |
| 2. Set up machine for in-line operation | 2.1 Substrate transportation system is set up according to job specifications  
2.2 Set off / marking prevention devices are set up and adjusted according to job specifications  
2.3 Appropriate image carrier / cutting device is selected and secured to the unit  
2.4 Impression is adjusted and set according to job specifications  
2.5 Image transfer or inking devices are adjusted and set according to job specifications |
| 3. Conduct proof run | 3.1 Material to be used for proof is organised correctly  
3.2 Machine is operated according to manufacturer's specifications and enterprise procedures to produce a specific proof  
3.3 Proof is visually inspected and / or tested or laboratory testing is organised according to enterprise procedures  
3.4 Production does not commence without client approval or authority where appropriate  
3.5 Results are interpreted and adjustments made according to product and machine specifications |
| 4. Maintain and monitor production process | 4.1 Production process is operated and monitored in association with fellow workers and according to enterprise procedures and planned daily schedule  
|  | 4.2 Product is monitored and minor adjustments are made to ensure quality of output is maintained  
|  | 4.3 Major adjustments to process are identified and reported to designated personnel according to enterprise procedures  
|  | 4.4 Faulty performance of equipment is identified and reported to designated person according to enterprise procedures  
|  | 4.5 Waste is sorted according to enterprise procedures  
| 5. Conduct shutdown of production process | 5.1 Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures  
|  | 5.2 Shutdown is conducted in association with fellow workers and in compliance with OHS requirements  
|  | 5.3 Unused ink / coating, if used in process, is correctly labelled and stored according to manufacturer's / supplier's specifications and enterprise procedures  
|  | 5.4 All product is removed from operating area  
|  | 5.5 Machine faults requiring repair are identified and reported to designated person according to enterprise procedures  
|  | 5.6 Repair / adjustment is verified prior to resumption of operations  
| 6. Clean and wash up | 6.1 Cylinders, image carriers / cutting devices and roller surfaces are cleaned ready for next run  
|  | 6.2 Image carriers / cutting devices are removed and stored according to manufacturer's / supplier's specifications and enterprise procedures  
|  | 6.3 Inking system and additional units are washed up ready for next run  
|  | 6.4 Liquid waste is disposed of according to enterprise procedures and regulatory requirements  
|  | 6.5 In-line units are cleaned ready for next run  
|  | 6.6 Substrate feed, transportation and delivery systems are disengaged and cleaned ready for next run  
|  | 6.7 Production records or other documentation are accurately completed where required by enterprise procedures |
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

The following skills must be assessed as part of this unit:

• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
• Communication of ideas and information by providing feedback to internal and external clients regarding in-line processes and job specifications
• Collecting, analysing and organising information by collecting and assessing data regarding printing operations, machine specifications, their characteristics and how they interact
• Planning and organising activities by organising production sequences to maximise efficiency
• Teamwork when communicating with work team members involved in prior and subsequent processes to ensure efficient production
• Mathematical ideas and techniques by calculating substrate requirements and printing pressures
• Problem-solving skills by monitoring product and making minor adjustments to ensure quality of output is maintained
• Use of technology by using monitoring equipment and interpreting readouts

Required knowledge:

The following knowledge must be assessed as part of this unit:

Job requirements

• What important information would you acquire from the job ticket?
• What would you do if vital information was missing from the job ticket?

Substrate transportation and control

• What devices are used to control the substrate in the in-line unit?
• What problems could develop from an incorrectly set transportation section?

In-line unit set up

• What OHS concerns need to be considered when setting up the in-line unit?
• What others units of the machine would need to be set up prior to the in-line unit?
• What parts of the in-line unit are responsible for position?
• What precautions need to be observed when setting the impression?

Conducting proof run

• What checks do you need to perform after a proof run on any in-line operation or process?
• Who would you notify if there was a problem with any aspect of the job during make ready?
• What methods are used to minimise waste during make ready?

Maintaining production process

• What are signs of wear of the image carrier?
• How is printed material that is not of an acceptable standard marked by the operator?
• What print faults would the operator be identifying during the print run?
• How frequently should the quality of the product be assessed?
Shutdown procedures

• What OHS requirements should be observed during machine shutdown?
• What areas of the in-line unit may require repair?
• How do you determine the workflow of the product?
• Who is responsible for the repair of the machine?

Cleaning and washing up procedures

• What procedures need to be observed when storing image carriers or cutting devices?
• What OHS concerns should be observed when storing cutting devices?
• What are the requirements for the disposal of liquid waste?
• What specific components of the in-line need to be cleaned thoroughly?
• What would be the effect on machine production if components were not cleaned thoroughly following the print run?

Completing production records

• What would be the outcome of the operator not completing production information on the job ticket?
• What records must be completed in the event of a reprint or repeat print run?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Machines

• Range of stack, in-line configuration and central impression printing machines with manual, semi-automated, fully automated or computerised process control. Machines can incorporate one or more in-line process operations in addition to the conventional printing processes

Design

• The in-line process or operation forms an integral part of the product being produced and would enhance, give a specific shape or provide additional features to the work. The combination of print intricacy and in-line features would be considered to be complex
In-line processes

- Processes that are integral to this competency may include in-line operations such as:
  - Numbering
  - Perforating
  - Slitting
  - Embossing
  - Cutting and creasing
  - Thermal transfer
  - Scoring / top cutting
  - Die cutting / stripping
  - Gluing
  - Sprocket hole punching
  - Over printing
  - Ink jet

Substrate

- Range of substrates within the major categories of paper, pressure sensitive material, board, corrugated board, plastics and related films or metal

Substrate handling

- Wide and narrow reel- and sheet-fed systems

Image carrier

- A device where the selected areas and surface are prepared in such a way as to transfer ink or image to the substrate

Additional units

- Includes any ancillary unit that is used in the production of the printed product eg dampening units, ink pumps, tanks and hoses

Degree of autonomy

- Working independently in consultation with others

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

- Evidence of the following is essential:
  - Set up and monitor in-line printing operations that would tend to be complex in nature and incorporated into other printing processes
  - Set up and monitor one or more in-line processes on TWO occasions according to job specifications, enterprise procedures and the Performance Criteria
  - Evidence for assessment can be gathered from a combination of activities of a number of units of competency
Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- reel or sheet-fed machine that incorporates an in-line process or operation described in the Range Statement

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.
ICPPR513B Set up for specialised flexographic printing

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to set up machines for specialised flexographic printing that requires a certain amount of problem solving and experimentation with the substrate and press settings.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to set up flexographic printing machines for specialised colour print jobs. The individual will work outside standard job routines to conduct a proof run and adjust settings to ensure production speeds are attained.

Mounting and demounting plates is covered in ICPPR411B Mount and demount flexographic plates for complex printing.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Confirm specialised job specifications

   1.1 Job requirements are read and interpreted from job documentation or production control system

   1.2 Set up is planned and carried out correctly in minimum time and with minimum wastage

   1.3 Availability of all job related components is checked

   1.4 Proofed job is checked for conformance with job specifications

2. Select and prepare inks and solvents for non-routine job

   2.1 Inks and solvents are selected according to job specifications and end-user requirements

   2.2 Quality and suitability of inks and solvents are checked and appropriate action is taken

   2.3 Inks and solvents are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste

   2.4 Correct colour and weight / volume of ink are mixed and viscosities checked and modified according to the press requirements and non-routine job specifications

   2.5 Ink formula and approved colour draw downs are appropriately recorded

   2.6 Inks and solvents are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions and the relevant hazardous liquids storage regulations
3. Set up machine for specialised flexographic printing

3.1 Flexographic plate cylinders are installed and register adjustments centred OR
3.2 Sleeves are installed in press and register adjustments made OR
3.3 Plate mounting sheets are mounted on cylinders in press and register adjustments made
3.4 Plate cylinders are gauged up or pre-set to impression
3.5 Anilox rollers are selected to suit individual colour and plate reproduction requirements for each unit
3.6 Appropriate ink metering system is selected for each unit
3.7 Inking system is set up and roller nips / blades are set correctly
3.8 Ink circulation is maintained at correct level
3.9 Viscosities are adjusted according to job specifications
3.10 Air volume and drier temperatures are selected to suit inks, substrate, solvents and according to job specifications
3.11 Air volume is adjusted between colours to maximise drying and minimise air overspill

4. Conduct proof run

4.1 Material to be used for proof is organised correctly
4.2 Press is set up and operated according to OHS guidelines
4.3 Print impressions are set to minimum kiss impression
4.4 Web tensions are correctly set at unwind, between stations and rewind
4.5 The print is checked for register
4.6 Drying is checked as sufficient to key ink to the substrate
4.7 The viscosities are adjusted to obtain the correct colour at proof speed
4.8 The viscosities are adjusted to obtain the correct colour at proof speed

5. Organise proof inspection and / or testing

5.1 Proof is visually inspected and / or tested or laboratory testing is organised according to enterprise procedures
5.2 Production does not commence without client approval or authority where appropriate

6. Troubleshoot machinery and material problems

6.1 Corrective or preventive action is recommended and implemented where appropriate
6.2 Changes are communicated to relevant personnel in a logical and easily understood manner
6.3 Changes are monitored to confirm improvement to production efficiency
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting the job brief and advising the client (internal or external) about options and limitations
- Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
- Planning and organising activities by evaluating the special job specifications when determining production scheduling
- Teamwork when cooperating with other workers to ensure efficient operation
- Mathematical ideas and techniques by calculating substrate requirements, plate position and pressures
- Problem-solving skills by evaluating special job specifications and adjusting machinery to produce specialised print job
- Use of technology by evaluating the capacity of individual machines to produce the specialised job specifications

Required knowledge:
The following knowledge must be assessed as part of this unit:

Interpreting specialised job specifications
- Why is it necessary to ensure that the job specifications are read and properly understood?
- What production problems could eventuate by not reading and understanding the job specifications?
- With whom would you discuss any production problems?

Mounting and proofing flexographic plates
- What OHS factors need to be considered when mounting and proofing flexographic plates?
- What is the most common cause of photopolymer plates crazing on the image side?
- Why is resiliency of the printing plate important?
- What is the main advantage of using thin photopolymer plates in process printing?
- What faults may be detected on new plates?
- What type of solvents should be used on photopolymer plates?
- What does the term V-block mounting mean?
- How is V-block mounting achieved?
- What are the benefits of optical mounting?
- What is the purpose of binding plates after mounting?
- What possible print faults could be eliminated by using cushion mount?

Installation of printing cylinders or sleeves
- What OHS factors need to be considered when installing printing cylinders or sleeves?
- What precautions should be taken to ensure that the plates and cylinders or sleeves are not damaged during installation?
- What needs to be checked to ensure plates and cylinders or sleeves have been installed correctly?
Reel transportation system

- What OHS precautions must be observed when webbing up the machine?
- How do you determine the position of the reel?
- How is the substrate pulled into the machine?
- What is the result of insufficient unwind tension?
- What is the result of excessive unwind tension?
- What is the function of the "Dancer" roller on a web machine?
- What is the function of the PIV unit?
- What is the result of adjustments to the PIV?
- What is the function of the lay-on roller?
- What will be the effect of excessive lay-on roller pressure?
- What can happen if the web is not spliced correctly?
- How does the particular web viewing device work?

Delivery system

- What OHS precautions must be observed when setting up the delivery?
- How is the web controlled in the rewind unit?
- What is the result of incorrect rewind tension?
- What remedial steps can be taken if there is a possibility of the ink marking in the rewind?
- What function does the use of air blast play in the delivery of sheets?

Preparing inks and additives

- What OHS precautions must be observed when preparing inks and additives?
- What details are necessary to check an ink's suitability for the printing process?
- What special end-use requirements may be necessary?
- What is the main function of a pigmented extender used in flexographic printing?
- Why are plasticisers added to flexographic inks?
- Why are other additives used in flexographic inks?
- What is the range in seconds for zahn cup measurements?
- What effect does foaming have in a zahn cup when measuring the ink viscosity?
- What is the recommended pH range when printing with aqueous inks?
- What precautions do you observe to minimise waste when preparing the ink?
- What is the shelf life of most inks?
- What conditions are relevant to the storage of inks and additives?
- What conventions should be adhered to when labelling mixed inks?

Specialised machine set up

- What OHS factors need to be considered when setting up the machine?
- What is the advantage of centring all machine controls?
- What checks should be made on cylinders and gears?
- What checks should be performed prior to cylinder or sleeve installation?
- What angle should the chamber blades be set?
- What is the main advantage of gauging up and dry register prior to printing a job?
- What cell count of the anilox roller is used when printing solids?
- Why should water treatment additives be used in a central impression drum and chill roller coolant system?
- What are the advantages of laser engraved ceramic anilox rollers?
- What are THREE things relating to the anilox roller that a roller scope will measure?
- What could be the reasons for anilox wear?
- What type of job would be printed using a hexagonal cell configuration?
- What is the recommended web temperature when printing polypropylene film?
• What method of drying is used when printing on polythene by the flexographic process?
• What factors affect the drying rate of liquid inks?
• What factors affect the drying of aqueous inks?
• What is the operating range of UV lamps?

Problem solving proofing and adjustment

• Why is it necessary to graduate the drying speeds of each progressive colour, so that first-down colours dry faster the subsequent colours?
• Why is it that in flexographic printing as the press speed increases so does the colour strength?
• What could cause a decrease in web tension?
• What could be the result of increasing rewind tension after the roll has been partially rewound?
• What would be the major cause of a telescopic roll?
• What print characteristics are related to excessive printing pressure?
• What causes picking when printing multicoloured work?
• What are the print faults resulting from using an over-reduced ink?
• What problems can cause lateral streaks showing up in uneven printing?
• What are the causes of moire patterns when printing by the flexographic process?
• What is the result of air being trapped under mounted plates?
• What is the instrument used to identify retained solvent trapped in the print?
• What is the purpose of taking Dyne readings?
• What is the purpose of the crinkle test when testing an ink?
• What would be the result if an excessive final drying temperature was used when printing polypropylene film?
• What property of ink can be adjusted to reduce dot gain?
• When checking the viscosity for ink whilst using ink pumps, why should the ink returning from the ink fountain not be used?
• What problems result from the excessive use of slow solvents?
• How does the "yield value" of ink affect the ink transfer of halftone dots?
• Why do laminating inks once printed appear dull and easy to scratch?
• What will be the result of excessive print area tension?
• What are some of the problems which the printer may associate with cold seals?

Information sources

• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
• Range of inks commonly used in 4 or more colour printing, including standard and special colours
<table>
<thead>
<tr>
<th>Colours matching systems</th>
<th>• Use of viscosity controls, densitometers and spectrophotometry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machines</td>
<td>• Range of stack, in-line and central impression flexographic printing machines with manual, semi-automated, fully automated or computerised process control</td>
</tr>
<tr>
<td>Design</td>
<td>• 4 or more colours, complex graphics and text. Critical &quot;tight&quot; registration, fit and position, registration should be at least that required for four-colour process work</td>
</tr>
<tr>
<td>Substrate types</td>
<td>• Range of substrates within the major categories of paper, pressure sensitive material, board, corrugated board, plastics and related films, or metal</td>
</tr>
<tr>
<td>Substrate handling</td>
<td>• Wide and narrow reel delivery systems</td>
</tr>
<tr>
<td>Degree of autonomy</td>
<td>• Working independently in consultation with others</td>
</tr>
<tr>
<td>Specialised</td>
<td>• Specialised within this context relates to the set up and production of print runs that involve new products, or a new mix of substrates and inks that requires a certain amount of problem solving and experimentation with the substrate and press settings. The set up of equipment and production involves the development of new set up and production approaches based on solving technical problems arising from new product or equipment combinations</td>
</tr>
</tbody>
</table>
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Set up flexographic printing machines for specialised print jobs that require a certain amount of problem solving and experimentation with the substrate and press settings. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
- Set up a flexographic printing machine for a specialised job on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to the manufacturer's and job specifications, enterprise procedures and the Performance Criteria.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
- flexographic press.

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR413B Set up for complex flexographic printing
- ICPPR314B Produce complex flexographic printed product
ICPPR521B  Set up for specialised gravure printing

Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to set up for specialised gravure printing that requires a certain amount of problem solving and experimentation with the substrate and press settings.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to set up gravure printing machines for specialised print jobs. The individual will work outside standard job routines to conduct a proof run and adjust settings to ensure production speeds are attained.

Unit Sector
Printing

ELEMENT PERFORMANCE CRITERIA

1. Confirm specialised job specifications
   1.1 Job requirements are read and interpreted from job documentation or production control system
   1.2 Set up is planned and carried out correctly in minimum time with minimum wastage
   1.3 Availability of all job related components is checked

2. Plan and carry out specialised set up
   2.1 Specialised job specifications are identified and analysed
   2.2 Special set up requirements are determined
   2.3 Specialised set up is completed in minimum time with minimum wastage

3. Set up reels
   3.1 Unwind and rewind reels are set up and adjusted according to job specifications
   3.2 Webbing procedures are carried out according to job specifications
   3.3 Web-control system is set up, evaluated and adjusted according to job specifications
   3.4 Reels are spliced / joined according to job specifications
   3.5 Printed web viewing devices are set up, evaluated and adjusted according to job specifications
   3.6 The folder and sheeter are set up, evaluated and adjusted according to job specifications
   3.7 Set off / marking prevention devices are set up, evaluated and adjusted according to job specifications
4. Select and prepare inks and additives

4.1 Inks, dyes or additives are evaluated with reference to specialised requirements

4.2 Inks, dyes or additives are selected according to job specifications

4.3 Inks, dyes and additives are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste

4.4 Correct colour and weight / volume of ink are mixed and prepared according to job specifications and the printing process

4.5 Formulation of the ink, colour match and the approved colour are appropriately recorded

4.6 Inks, dyes and additives are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions to prevent damage and hazards to personnel and prolong shelf life

5. Set up machine for specialised gravure printing

5.1 Gravure cylinders are selected, installed, set up and adjusted according to job specifications

5.2 Impression roller is set up and adjusted according to job specifications

5.3 Inking system / doctor blade is set up and adjusted according to the gravure process and job specifications

5.4 Drying system is set up and adjusted according to job specifications

6. Conduct specialised proof run

6.1 Material to be used for proof is organised correctly

6.2 Machine is operated according to manufacturer's specifications and enterprise procedures to produce a specified proof

6.3 Proof is visually inspected and / or tested or laboratory testing is organised according to enterprise procedures

6.4 Production does not commence without client approval or authority where appropriate

6.5 Results are interpreted and evaluated with adjustments carried out according to product and machine specifications

7. Troubleshoot machinery and material problems

7.1 Corrective or preventive action is recommended and implemented where appropriate

7.2 Changes are communicated to relevant personnel in a logical and easily understood manner

7.3 Changes are monitored to confirm improvement to production efficiency

7.4 Ongoing problems are reported according to enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting the job brief and providing advice to internal or external clients about options and limitations
- Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when maintaining the production process in association with others
- Mathematical ideas and techniques by calculating cylinder position, pressures and substrate requirements
- Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
- Use of technology by using monitoring equipment and computerised production records

Required knowledge:

The following knowledge must be assessed as part of this unit:

Specialised job specifications

- Why is it necessary to ensure that the job specifications are read and properly understood?
- What production problems could eventuate by not reading and understanding the job specifications?
- With whom would you discuss any production problems?

Printing cylinders

- What OHS precaution must be observed when installing printing cylinders on the machine?
- How should you determine the optimum print sequence?
- What visual aid on the cylinder identifies the colour of ink to be used?
- What precautions were taken to ensure that the cylinders were not damaged during installation?

Reel transportation system

- What OHS precautions must be observed when webbing up the machine?
- How should you determine the position of the reel?
- What can happen if the brake tension is not set correctly?
- What is the function of the "Dancer" roller on a web machine?
- What can happen if the web is not spliced correctly?
- How does the particular web viewing device work?
- What is the principle of ESA roller operation on the gravure printing machine?
- On what type of substrate should the ESA roller be used?

Delivery system

- What OHS precautions must be observed when setting up the delivery?
How is the web controlled in the rewind unit?
What is the result of incorrect rewind tension?
What remedial steps can be taken if there is a possibility of the ink marking in the rewind?
What problems could be attributed to a blunt knife when sheeting?
What function does the use of air blast play in the delivery of sheets?

Inks and additives

What OHS precautions must be observed when preparing inks and additives?
What details are necessary to check an ink's suitability for the printing process?
What special end-use requirements may be necessary?
Why are additives used in gravure inks?
What is the range in seconds for zahn cup measurements?
What effect does foaming have in a zahn cup when measuring the ink viscosity?
Why should pigmented ink be brought to operating temperature before correcting the viscosity?
Why are these checks essential?
What is the advantage of using automatic viscosity controllers?
What precautions do you observe to minimise waste when preparing the ink?
What is the shelf life of most inks?
What conditions are relevant to the storage of inks and additives?
What conventions should be adhered to when labelling mixed inks?

Specialised machine set up

What OHS factors need to be considered when setting up the machine?
What is the function of chill rollers on a machine?
What is the main advantage of gauging up and dry register prior to printing a job?
What would be result of excess printing pressure?
How was the pressure to be applied to the doctor blade determined?
What print faults could be caused by excessive overspill of air from the inter-colour drier?
What is the recommended air ratio for efficient inter-colour drying?
What are the advantages of using high velocity air in the drying system?

Problem solving for specialised printing

What will cause the doctor blade to wear on a gravure printing unit?
How can the wear of the doctor blade be reduced?
How is the optimum make ready speed determined for the job?
How were the steps involved in make ready communicated to other team members?
Why is it necessary to grade the drying speeds of each progressive colour, so that first-down colours dry faster the subsequent colours?
What could cause a decrease in web tension?
What could be the result of increasing rewind tension after the roll has been partially rewound?
What would be the major cause of a telescopic roll?
How would you test metallised film to find out which is the correct side on which to print?
How is the metallised surface measured for coating thickness?
How does annealing affect aluminium foil?
What is the purpose of using thermal imaging face stocks?
How are substrates metallised?
What are the client requirements for bar codes?
What print characteristics are related to excessive printing pressure?
What causes picking when printing multicoloured work?
• What are the print faults resulting from using an over-reduced ink?
• What are the causes of moire patterns when printing by the gravure process?
• What is the instrument used to identify retained solvent trapped in the print?
• What is the purpose of taking Dyne readings?
• What is the purpose of the crinkle test when testing an ink?
• What print faults would result from a worn doctor blade?
• When checking the viscosity for an ink whilst using ink pumps, why should the ink returning from the ink fountain not be used?
• What problems result from the excessive use of slow solvents?
• Why do laminating inks once printed appear dull and easy to scratch?
• What will be the result of excessive print area tension?
• What are some of the problems which the printer may associate with cold seals?
• Who has the final say in the "OK" of the job?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
- Range of inks commonly used in 3 or more colour printing, including standard and special colours

Colour matching systems
- Use of viscosity controls, densitometers and spectrophotometry

Machines
- Range of stack, in-line and central impression printing machines with manual, semi-automated, fully automated or computerised process control

Design
- 3 or more colours, complex graphics and text. Critical "tight" registration, fit and position, registration should be at least that required for four-colour process work

Substrate types
- Range of substrates within the major categories of paper, board, plastics and related films, or metal

Substrate handling
- Wide and narrow reel handling systems
Degree of autonomy

- Working independently in consultation with others

Specialised

- Specialised within this context relates to the set up and production of print runs that involve new products, or a new mix of substrates and inks that requires a certain amount of problem solving and experimentation with the substrate and press settings. The set up of equipment and production involves the development of new set up and production approaches based on solving technical problems arising from new product or equipment combinations

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Set up gravure printing machines for specialised print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources
- Set up a gravure printing machine for a specialised job on TWO occasions (if possible using different substrates) according to manufacturer's specifications, enterprise procedures and the Performance Criteria
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
- gravure printing machine
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR322B Produce complex gravure printed product
- ICPPR421B Set up for complex gravure printing
ICPPR531B
Unit Descriptor
This unit describes the performance outcomes, skills and knowledge required to set up for specialised lithographic printing that requires a certain amount of problem solving and experimentation with the substrate and press settings.

Employability Skills
This unit contains employability skills.

Application of the Unit
This unit requires the individual to evaluate set up options and then set up either wide or narrow reel or sheet-fed lithographic printing machines for specialised print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained in minimum time with minimum wastage.

Unit Sector
Printing

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Confirm specialised job specifications | 1.1 Job requirements are read and interpreted from job documentation or production control system  
1.2 Availability of all job related components is checked |
| 2. Plan and carry out specialised set up | 2.1 Specialised job specifications are identified and analysed  
2.2 Special set up requirements are determined  
2.3 Specialised set up is completed in minimum time and with minimum wastage |
| 3. Set up reel system (OR Element 4) | 3.1 Unwind and rewind reels set up options are analysed and set up is completed and adjusted according to job specifications  
3.2 Webbing procedures are carried out according to job specifications  
3.3 Web-control system is set up, options are analysed and set up is completed and adjusted according to job specifications  
3.4 Reels are spliced / joined according to job specifications  
3.5 Printed web viewing devices are set up and adjusted according to job specifications  
3.6 The folder and sheeter are set up and adjusted according to job specifications  
3.7 Set off / marking prevention devices are set up and adjusted according to job specifications |
| 4. Set up sheet system (OR Element 3) | 4.1 Feeder and delivery sections are set up, options are analysed and set up is completed and adjusted according to job specifications  
4.2 Sheet pick-up, transportation, control and transfer systems are set up, adjusted and evaluated according to job specifications  
4.3 Substrate is removed from process according to job specifications  
4.4 Set off / marking prevention devices are set up, adjusted and evaluated according to job specifications |
5. Select and prepare inks and additives

5.1 Colour sequence for the job is considered and confirmed
5.2 Inks, dyes or additives are evaluated with reference to job specifications
5.3 Inks, dyes or additives are selected based on job specifications
5.4 Inks, dyes and additives are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste
5.5 Correct colour and weight / volume of ink are mixed and prepared to match the requirements of the printing process and job specifications
5.6 Formulation of the ink, colour match and the approved colour are appropriately recorded
5.7 Inks, dyes and additives are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions to prevent damage and hazards to personnel and prolong shelf life

6. Set up machine for specialised lithographic printing

6.1 Plate cylinder is set up, evaluated and adjusted according to job specifications
6.2 Lithographic plate is selected and prepared for installation
6.3 Plates are correctly mounted according to job specifications and in a safe manner
6.4 Blanket and blanket cylinder are set up, evaluated and adjusted according to job specifications
6.5 Impression cylinder is set up, evaluated and adjusted according to job specifications
6.6 Inking system is set up, evaluated and adjusted according to the lithographic process and job specifications
6.7 Dampening system is set up, evaluated and adjusted according to job specifications
6.8 Drying system is set up, evaluated and adjusted according to job specifications

7. Conduct specialised proof run

7.1 Material to be used for specialised proof is organised correctly
7.2 Machine is operated according to manufacturer's specifications and enterprise procedures to produce a specialised proof
7.3 Specialised proof is visually inspected and / or tested or laboratory testing is organised according to enterprise procedures
7.4 Production does not commence without client approval or authority where appropriate
7.5 Results are interpreted and adjustments are carried out according to product and machine specifications
8. Troubleshoot machinery and material problems

8.1 Corrective or preventive action is recommended and implemented where appropriate

8.2 Changes are communicated to relevant personnel in a logical and easily understood manner

8.3 Changes are monitored to confirm improvement to production efficiency

8.4 Ongoing problems are reported according to enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting the job brief and providing advice to clients about options and limitations
- Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when maintaining the production process in association with others
- Mathematical ideas and techniques by calculating substrate requirements, plate position and pressures
- Problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications
- Use of technology by using monitoring equipment and computerised production records

Required knowledge:
The following knowledge must be assessed as part of this unit:

Specialised job specifications

- Why is it necessary to ensure that the job specifications are read and properly understood?
- What production problems could eventuate by not reading and understanding the job specifications?
- With whom would you discuss any production problems?

Preparing and fitting plates

- What problem can result from the plate cylinder not being cleaned prior to plate fitting?
- What could happen if the plate is over tensioned during fitting?
- What faults could result from a plate being under tensioned?
- Why is accurate plate bending necessary on a web-fed machine?
- What considerations would have to be made when deciding the colour sequence?
- What visual aid on the plate identifies the colour of ink to be used?

Reel transportation system on a web-fed machine

- What OHS precaution must be observed when webbing up the machine?
- How should you determine the position of the reel?
- What can happen if the brake tension is not set correctly?
- What is the function of the "Dancer" roller on a web machine?
- How should you determine the position of the bustle wheels?
- What can happen if the web is not spliced correctly?
- How does the particular web viewing device work?

Sheet transportation system on a sheet-fed machine

- What OHS factors need to be considered when setting up the sheet transportation and delivery systems?
What could cause more than one sheet to be picked up in the feeder?
Why is accurate feeder set up essential?
What determines the position of the sheet prior to being transferred to the printing unit?
How should you determine which front lays to use?
What type of substrate would require additional front lays to be engaged?
Why would additional front lays be necessary when printing this type of substrate?

Reel delivery system on a web-fed machine
- What OHS precaution must be observed when setting up the delivery?
- How is the web controlled in the rewind unit?
- What is the function of a slitter on a web machine?
- What could cause the web to jam up in the folder?
- Why is it necessary to disengage the folder if sheeting?
- What problems could be attributed to a blunt knife when sheeting?
- What safety feature is in the delivery system if the web jams up?
- Which fold is always made with the grain of the web?
- What type of folder, folds the web in half in the direction of the web grain?
- What remedial steps can be taken if there is a possibility of the ink marking in the folder?
- What is the main reason for having a silicone applicator on a web machine?

Sheet delivery system on a sheet-fed machine
- What OHS precaution must be observed when removing sheets from the delivery?
- What could cause sheets to be delivered incorrectly?
- What adjustments would be necessary if changing from lightweight to heavyweight stocks?
- What determines the sheet release into the delivery?
- What are the problems resulting from the excessive use of anti set off spray powder?
- What could cause printed sheets to set off in the delivery?
- How can the possibility of set off in the delivery be reduced?
- What fault may be created if there is excess vacuum on the slow-down wheels?

Inks and additives
- What are the OHS concerns related to the preparation of inks and additives?
- What details are necessary to check an ink's suitability for the printing process?
- What special end-use requirements may be necessary?
- Why may it be necessary to mix an additive into the ink?
- Explain how a spectrophotometer can be used to assess the colour of an ink.
- Describe the formula for calculating the correct quantity of lithographic ink.
- What print fault will occur if excessive driers are mixed into the ink?
- What precautions do you observe to minimise waste when preparing the ink?
- What is the shelf life of most inks?
- What conditions are relevant to the storage of inks and additives?
- What conventions should be adhered to when labelling mixed inks?

Specialised machine set up
- What OHS factors need to be considered when setting up the machine?
- What checks should be made on the plate prior to fitting?
- How much plate packing was required?
- What is the normal printing pressure required between plate and blanket?
- How should you determine the correct printing pressure between blanket and stock?
- What is the ideal blanket surface condition?
- How is the correct blanket tension achieved when fitting a new blanket?
• What print faults can occur if the impression cylinder is not maintained?
• In what order should eccentric or concentric roller adjustments be made?
• When setting the rollers, what should be the width of the contact stripe between two rollers?
• How should you determine the ink duct setting?
• What is the ideal ink duct sweep setting?
• What is the recommended degrees shore hardness for bare back and conventional dampeners?
• What should be the conductivity of the fountain solution?
• Why is it necessary to constantly check the conductivity of the fountain solution?
• How could you change the amount of fountain solution across the plate surface?
• Why may it be necessary to adjust the fountain solution laterally?
• Why could you not engage the perfecting unit?
• What is the main reason for blistering on a heatset machine?
• What does the oven evaporate from the ink?
• What is the function of chill rollers on a web machine?
• What are the types of ink drying / curing systems?

Problem solving proofing and adjustment
• Describe the operation of the true inch function fitted to some machines.
• What problems may cause the machine to keep stopping?
• What checks are necessary prior to engaging the impression?
• What checks are performed when running the machine?
• What effect will the position of certain guards have on the operation of the machine?
• How were the steps involved in operating the machine communicated to other team members?
• What aids are available for the testing of the machine proof?
• What tests are necessary for this job?
• Where should the testing take place?
• What is the function of a polarisation filter in a densitometer?
• What are the ideal conditions for inspecting the proof?
• Why is it necessary to use visual aids on the printed sheets?
• What is the acceptable wet trap value range for lithographic inks?
• What could be used as an indication of optimum solid ink density in the absence of a proof?
• What would be the result of low solid ink density and excessive dot gain?
• What methods are available to check and adjust ink colour and consistency?
• What adjustments may have caused mis-register?
• What adjustments are made to position the image laterally?
• What adjustments are made to position the image circumferentially?
• What adjustments are made to position the image diagonally?
• How can changing the colour sequence affect the wet trap value?
• What is the procedure to lengthen the print length on this type of press?
• What is the procedure to shorten the print length on this type of press?
• What is the difference between mechanical and optical dot gain?
• What can cause excessive mechanical dot gain?
• Who has the final say in the “OK” of the job?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?
RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
- Wide range of inks commonly used in printing

Colour matching systems
- Use of densitometers and / or spectrophotometry

Machines
- Range of single sheet, stream-fed or reel-fed printing machines with manual, semi-automated, fully automated or computerised process control. Includes machines with digitally imaged plates

Design
- Complex graphics and text. Critical "tight" registration, fit and position, registration for quality print jobs

Substrate types
- Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal

Substrate handling
- Wide and narrow reel, and large and small sheet handling systems

Degree of autonomy
- Working independently in consultation with others

Specialised
- Specialised within this context relates to the set up and production of print runs that involve new products, or a new mix of substrates and inks that requires a certain amount of problem solving and experimentation with the substrate and press settings. The set up of equipment and production involves the development of new set up and production approaches based on solving technical problems arising from new product or equipment combinations
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Set up either wide or narrow reel or sheet-fed lithographic printing machines for specialised print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained in minimum time with minimum wastage.
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
- Set up a lithographic printing machine for a specialised job on TWO occasions (if possible using different substrates and sheet sizes if sheet-fed and if possible including at least TWO in-line processes) according to manufacturer's and job specifications, enterprise procedures and the Performance Criteria.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
- lithographic printing machine.

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR332B Produce complex lithographic printed product
- ICPPR431B Set up for complex lithographic printing
ICPPR541B **Set up for specialised pad printing**

**Unit Descriptor**
This unit describes the performance outcomes, skills and knowledge required to set up for specialised pad printing that requires a certain amount of problem solving and experimentation with the substrate and press settings.

**Employability Skills**
This unit contains employability skills.

**Application of the Unit**
This unit requires the individual to set up pad printing machines for multicoloured or specialised print jobs. The individual will set up manual pre and post-treatment processes and conduct a proof run and adjust settings to ensure production speeds are attained.

**Unit Sector**
Printing

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Confirm specialised job specifications | 1.1 Job requirements are read and interpreted from job documentation or production control system  
1.2 Availability of all job related components is checked |
| 2. Plan and carry out specialised set up | 2.1 Specialised job specifications are identified and analysed  
2.2 Specialised set up requirements are determined  
2.3 Specialised set up is completed in minimum time with minimum wastage  
2.4 Appropriate tampons are selected according to job specifications  
2.5 Tampons are secured into machine |
| 3. Conduct specialised set up of fixtures onto machine bed or conveyor | 3.1 Appropriate fixtures are selected and secured to xy table or conveyor jig plates  
3.2 Height of machine bed is adjusted to suit size of object to be printed  
3.3 Xy table of machine bed is adjusted to suit position of image on object |
| 4. Select and prepare inks and additives | 4.1 Inks and additives are evaluated according to job specifications  
4.2 Inks and additives are selected according to job specifications  
4.3 Inks and additives are prepared according to OHS requirements and manufacturer's / supplier's instructions with suitable precautions to minimise waste  
4.4 Correct colour and weight / volume of ink are mixed and prepared according to the requirements of the printing process and job specifications  
4.5 Formulation of the ink, colour match and the approved colour are appropriately recorded  
4.6 Inks and additives are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions to prevent damage and hazards to personnel and prolong shelf life |
5. Set up machine for specialised pad printing

5.1 Plate holders are set up and adjusted for register according to job specifications
5.2 Appropriate plates and plate holders are selected and plates are secured into plate holders
5.3 Tampons are set up, evaluated and adjusted according to job specifications
5.4 Spatula and doctor blade are set up, evaluated and adjusted according to the requirements of the pad printing process and job specifications OR
5.5 Ink cups are set up, evaluated and adjusted according to job specifications

6. Set up pre- and post-treatment processes

6.1 In-line loading is set up according to specialised object requirements and job specifications
6.2 In-line drying is set up according to specialised object requirements and job specifications
6.3 In-line ejection is set up according to specialised object requirements and job specifications

7. Conduct specialised proof run

7.1 Material to be used for proof is organised correctly
7.2 Machine is operated according to manufacturer’s specifications and enterprise procedures to produce a specified proof
7.3 Proof is visually inspected and / or tested or laboratory testing is organised according to enterprise procedures
7.4 Production does not commence without client approval or authority where appropriate
7.5 Results are interpreted and adjustments are carried out according to product and machine specifications

8. Troubleshoot machinery and material problems

8.1 Corrective or preventive action is recommended and implemented where appropriate
8.2 Changes are communicated to relevant personnel in a logical and easily understood manner
8.3 Changes are monitored to confirm improvement to production efficiency
8.4 Ongoing problems are reported according to enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting the job brief and providing advice to clients about options and limitations
- Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job
- Planning and organising activities by providing information about time and materials requirements for production scheduling
- Teamwork when maintaining the production process in association with others
- Mathematical ideas and techniques by calculating substrate requirements, cliche and tampon position, and pressures
- Problem-solving skills by recognising proofing faults and determining adjustments to meet job specifications
- Use of technology by using monitoring equipment and making adjustments

Required knowledge:
The following knowledge must be assessed as part of this unit:

Substrate identification
- Identify FOUR different substrate groups and suggest the correct ink type for each group.
- For the purpose of ink selection the plastics can be broken down into a number of sub-groups. Identify THREE of these.

Ink selection
- How do you adjust process colour inks for correct colour balance?
- Describe TWO methods of improving opacity of a light coloured ink on a dark substrate.

Pad selection
- How do you determine the correct pad shape for these FOUR (given) applications?
- What effect do pad shape and hardness have on print quality?
- What effect can commonly be seen at the contact point of the nipple of a pad in a large solid print and how can it be avoided?
- How is a new pad prepared for its first printing?

Plate selection
- How do you determine correct plate type for these THREE (given) applications?
- Explain the difference between steel and photopolymer plates for process printing.

Registration
- What are THREE reasons for mis-registered images, and how can they be corrected?

Doctor blades
- What OHS concerns are there when setting presses and doctor blades?
- How do you adjust the machine so that the doctor blade is operating correctly?
• What is the effect of a damaged doctor blade?
• Name TWO types of doctor blades and explain their applications.

Specialised pre- and post-treatment requirements
• What OHS concerns are there when pre- and post-treating substrates?
• What are the common pre- and post-treatment methods for TWO different substrates?
• Why are these treatments important?

Specialised print problem identification and correction
• What are the causes and solutions for SIX common print problems (eg hairlines around image, loss of density in the centre of a solid image, fine lines of ink running through image, distortion of image, picking up ink from substrate by subsequent pads, washed out images, loss of fine lines in images, inconsistent colour)?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Inks / coatings
• Range of standard inks commonly used in multicoloured printing

Colour matching systems
• Use of visual colour assessment to match basic standard colours and / or Pantone shades under controlled lighting conditions

Machines
• A range of pad printing machines with manual, semi-automated, fully automated or computerised operation

Design
• Multicoloured, complex graphics and text. Critical tight registration, fit and position

Pre- and post-treatment processes
• Range of pre- and post-treatment techniques used in pad printing

Substrate types
• Range of substrates within the major categories of paper, wood, glass (ceramics), plastics, metal
Substrate handling

• Manual handling

Degree of autonomy

• Working independently under limited supervision

Specialised

• Specialised within this context relates to the set up and production of print runs that involve new products, or a new mix of substrates and inks that requires a certain amount of problem solving and experimentation with the substrate and press settings. The set up of equipment and production involves the development of new set up and production approaches based on solving technical problems arising from new product or equipment combinations

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

• Set up pad printing machines for specialised print jobs. The individual will set up manual pre- and post-treatment processes and conduct a proof run and adjust settings to ensure production speeds are attained
• Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate
• Demonstrate an ability to find and use information relevant to the task from a variety of information sources
• Set up a machine for specialised pad printing on TWO occasions (if possible on different substrates) to meet manufacturer's and job specifications, enterprise procedures and the Performance Criteria
• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Context of and specific resources for assessment

Assessment must ensure:

• assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment
• a pad printing machine
Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR342B Produce complex pad printed product
- ICPPR441B Set up for complex pad printing
**ICPPR551B Set up for specialised relief printing**

**Unit Descriptor**
This unit describes the performance outcomes, skills and knowledge required to set up for specialised relief printing that requires a certain amount of problem solving and experimentation with the substrate and press settings.

**Employability Skills**
This unit contains employability skills.

**Application of the Unit**
This unit requires the individual to set up reel- or sheet-fed plate, cylinder or rotary printing machines for specialised print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.

**Unit Sector**
Printing

### ELEMENT PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Confirm specialised job specifications | 1.1 Specialised job specifications are read and interpreted from job documentation or production control system  
1.2 Availability of all job related components is checked |
| 2. Plan and carry out specialised set up | 2.1 Special job specifications are identified and analysed  
2.2 Special set up requirements are determined  
2.3 Special set up is completed in minimum time with minimum wastage |
| 3. Set up reel system (OR Element 3) | 3.1 Unwind and rewind reels are set up, evaluated and adjusted according to job specifications  
3.2 Webbing procedures are carried out and web-control system is set up, evaluated and adjusted according to job specifications  
3.3 Reels are spliced / joined according to job specifications  
3.4 Printed web viewing devices are set up, evaluated and adjusted according to job specifications  
3.5 Folder and sheeters are set up, evaluated and adjusted according to job specifications  
3.6 Set off / marking prevention devices are set up, evaluated and adjusted according to job specifications |
| 4. Set up sheet system (OR Element 2) | 4.1 Feeder and delivery sections are set up, evaluated and adjusted according to job specifications  
4.2 Sheet pick-up and transportation system is set up, evaluated and adjusted according to job specifications  
4.3 Transfer and control systems are set up, evaluated and adjusted according to job specifications  
4.4 Substrate is added to and removed from process according to job specifications  
4.5 Set off / marking prevention devices are set up, evaluated and adjusted according to job specifications |
5. Evaluate, select and prepare inks and additives

5.1 Inks, dyes or additives are evaluated according to end-user requirements and job specifications

5.2 Inks, dyes and additives are selected according to end-user requirements and job specifications

5.3 Inks, dyes and additives are prepared according to OHS requirements, and manufacturer's / supplier's instructions with suitable precautions to minimise waste

5.4 Correct colour and weight / volume of ink are mixed and prepared according to the requirements of the printing process and job specifications

5.5 Formulation of the ink, colour match and the approved colour are appropriately recorded

5.6 Inks, dyes and additives are appropriately labelled, handled and stored according to manufacturer's / supplier's instructions to prevent damage and hazards to personnel and prolong shelf life

6. Set up machine for specialised relief printing

6.1 Appropriate relief plates are selected and secured to the machine

6.2 Relief polymer plates / forme are set up and adjusted according to job specifications (platen)

6.3 Relief polymer cylinders are set up and adjusted according to job specifications (platen)

6.4 Impression is set up and adjusted according to job specifications (platen and rotary)

6.5 Inking system is set up and adjusted according to the requirements of the relief process and job specifications (platen and rotary)

6.6 Drying system is set up and adjusted according to job specifications

7. Conduct specialised proof run

7.1 Material to be used for specialised proof is organised correctly

7.2 Machine is operated according to manufacturer's specifications and enterprise procedures to produce a specialised proof

7.3 Specialised proof is visually inspected and / or tested or laboratory testing is organised according to enterprise procedures

7.4 Production does not commence without client approval or authority where appropriate

7.5 Results are interpreted and adjustment changes are carried out according to product and machine specifications

8. Troubleshoot machinery and material problems

8.1 Corrective or preventive action is recommended and implemented where appropriate

8.2 Changes are communicated to relevant personnel in a logical and easily understood manner

8.3 Changes are monitored to confirm improvement to production efficiency

8.4 Ongoing problems are reported according to enterprise procedures
REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:
The following skills must be assessed as part of this unit:

- OHS in relation to operating machinery such as safely switching off machinery before cleaning is started
- Communication of ideas and information by interpreting the job brief and providing advice to clients about options and limitations
- Collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for job
- Planning and organising activities by evaluating the special job specifications when determining production scheduling
- Teamwork when maintaining the production process in association with others
- Mathematical ideas and techniques by calculating substrate requirements, plate position and pressures
- Problem-solving skills by recognising proofing faults and determining adjustments to meet job specifications
- Use of technology by using monitoring equipment and making adjustments

Required knowledge:
The following knowledge must be assessed as part of this unit:

Specialised job specifications

- Why is it necessary to ensure that the job specifications are read and properly understood?
- What production problems could eventuate by not reading and understanding the job specifications?
- With whom would you discuss any production problems?

Relief plates

- Why is hardness of the printing plate important?
- What faults may be detected on new plates?
- What type of solvents should be used on photopolymer plates?
- What does the term V-block mounting mean?
- How is V-block mounting achieved?
- What is the purpose of binding plates after mounting?
- What checks were performed prior to cylinder installation?
- Why should machine frames and unit slides be kept cleaned?
- What OHS precaution must be observed when installing printing cylinders in the machine?
- How should you determine the optimum print sequence?
- What visual aid on the plate identifies the colour of ink to be used?
- What precautions were taken to ensure that the plate / cylinders were not damaged during installation?

Reel transportation system on a web-fed machine

- What OHS precaution must be observed when webbing up the machine?
- How should you determine the position of the reel?
- What can happen if the brake tension is not set correctly?
- What is the function of the "Dancer" roller on a web machine?
• What is the function of nip rollers?
• What can happen if the web is not spiced correctly?

Sheet transportation system on a sheet-fed machine
• What are the major OHS concerns when setting up the sheet transportation system?
• What could cause more than one sheet to pick up in the feeder?
• Why is accurate feeder set up essential?
• What determines the position of the sheet prior to being transferred to the printing unit?
• How should you determine which front lays to use?
• What type of substrate would require additional front lays to be engaged?
• Why would additional front lays be necessary when printing this type of substrate?

Reel delivery system on a web-fed machine
• What OHS precaution must be observed when setting up the delivery?
• How is the web controlled in the rewind unit?
• What is the function of a slitter on a web machine?
• What problems could be attributed to a blunt knife when sheeting?
• What remedial steps can be taken if there is a possibility of the ink marking in the rewind?

Sheet delivery system on a sheet-fed machine
• What OHS precaution must be observed when removing sheets from the delivery?
• What could cause sheets to be delivered incorrectly?
• What adjustments would be necessary if changing from lightweight to heavyweight stocks?
• What determines the sheet release into the delivery?
• What are the problems resulting from the excessive use of anti set off spray powder?
• What could cause printed sheets to set off in the delivery?
• How can the possibility of set off in the delivery be reduced?
• How does air blast assist sheet delivery?

Inks and additives
• What are the OHS concerns related to the preparation of inks and additives?
• What details are necessary to check inks suitability for the printing process?
• What special end-use requirements may be necessary?
• Why may it be necessary to mix an additive into the ink?
• Explain how a spectrophotometer can be used to assess the colour of ink.
• Describe the formula for calculating the correct quantity of ink in relief printing.
• What print fault will occur if excessive driers are mixed into the ink?
• What precautions do you observe to minimise waste when preparing the ink?
• What is the shelf life of most ink?
• What conditions are relevant to the storage of inks and additives?
• What conventions should be adhered to when labelling mixed inks?

Specialised machine set up
• What are the major OHS concerns when setting up the machine?
• How much packing was required in the tympan?
• How is the amount of printing pressure determined?
• What is the ideal condition of the tympan?
• How is the correct top sheet tension achieved when fitting a new tympan?
• What print faults can occur if the tympan is not tensioned correctly?
• In what order should eccentric or concentric roller adjustments be made?
• When setting the rollers, what should be the width of the contact stripe between two rollers?
• How should you determine the ink duct setting?
• What is the ideal ink duct sweep setting?
• What is the recommended degrees shore hardness for forme rollers?
• What is the main reason for blistering on a heatset machine?
• What are the types of ink drying / curing systems?
• How does the drying unit cure the ink?

Problem solving proofing and adjustment
• Describe the operation of the true inch function fitted to some machines.
• What problems may cause the machine to keep stopping?
• What checks are necessary prior to engaging the impression?
• What checks were performed when running the machine?
• What effect will the position of certain guards have on the operation of the machine?
• How were the steps involved in operating the machine communicated to other team members?
• What aids are available for the testing of the machine proof?
• What tests are necessary for this job?
• Where should the testing take place?
• What is the function of a polarisation filter in a densitometer?
• What are the ideal conditions for inspecting the proof?
• Why is it necessary to use visual aids on the printed substrate?
• What could be the cause of a halo effect on the image?
• What methods are available to check and adjust ink colour and consistency?
• What adjustments may have caused mis-register?
• What adjustments are made to position the image laterally?
• What adjustments are made to position the image circumferentially?
• How can changing the colour sequence effect the final colour cast?
• What is the procedure to lengthen the print length on this type of press?
• What is the procedure to shorten the print length on this type of press?
• What is the difference between mechanical and optical dot gain?
• What can cause excessive mechanical dot gain?
• Who has the final say in the "OK" of the job?

In-line processes
• What in-line processes can be used in specialised pad printing?

Information sources
• What machine manuals, safety and other documentation are relevant to this task and where are they kept?
• What information is included in these documents?
• What other sources of information are available?
RANGE STATEMENT

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<thead>
<tr>
<th>Inks / coatings</th>
<th>Range of inks commonly used in colour printing, including standard and special colours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour matching systems</td>
<td>Use of densitometers and spectrophotometry</td>
</tr>
<tr>
<td>Machines</td>
<td>Range of platen, cylinder and rotary machines with manual, semi-automated, fully automated or computerised process control</td>
</tr>
<tr>
<td>Design</td>
<td>3 or more colours, complex graphics and text. Critical &quot;tight&quot; registration, fit and position, registration should be at least that required for four-colour process work</td>
</tr>
<tr>
<td>Substrate types</td>
<td>Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal</td>
</tr>
<tr>
<td>Substrate handling</td>
<td>Wide and narrow reel, and large and small sheet handling systems</td>
</tr>
<tr>
<td>Degree of autonomy</td>
<td>Working independently in consultation with others</td>
</tr>
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EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

- Set up reel- or sheet-fed platen, cylinder or rotary printing machines for specialised print jobs. The individual will conduct a proof run and adjust settings to ensure production speeds are attained.
- Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate.
- Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
- Set up a relief printing machine for specialised printing on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to manufacturer's and job specifications, enterprise procedures and the Performance Criteria.
- Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.

Context of and specific resources for assessment

Assessment must ensure:

- assessment may take place on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
- reel- or sheet-fed platen, cylinder or rotary printing machine.

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICPPR352B Produce complex relief printed product
- ICPPR451B Set up for complex relief printing