



Australian Government

Department of Education, Employment and Workplace Relations

ICPPR513C Set up for specialised flexographic printing

Revision Number: 1

ICPPR513C Set up for specialised flexographic printing

Modification History

Not applicable.

Unit Descriptor

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.
------------------------	---

Application of the Unit

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.
--------------------------------	---

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
-----------------------------	--

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
---	--

Elements and Performance Criteria

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 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

ELEMENT	PERFORMANCE CRITERIA
	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

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- 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

- job specifications
- production problems that could eventuate by not reading and understanding the job specifications
- responsible person to discuss any production problems
- OHS factors that need to be considered when mounting and proofing flexographic plates
- most common cause of photopolymer plates crazing on the image side
- importance of resiliency of the printing plate
- main advantage of using thin photopolymer plates in process printing
- faults that may be detected on new plates
- type of solvents that should be used on photopolymer plates
- meaning of the term V-block mounting
- V-block mounting
- benefits of optical mounting
- purpose of binding plates after mounting
- possible print faults that could be eliminated by using cushion mount
- OHS factors that need to be considered when installing printing cylinders or sleeves
- precautions that should be taken to ensure that the plates and cylinders or sleeves

REQUIRED SKILLS AND KNOWLEDGE

- are not damaged during installation
- checks to be made to ensure plates and cylinders or sleeves have been installed correctly
- OHS precautions that must be observed when webbing up the machine
- positioning of the reel
- pulling the substrate into the machine
- result of insufficient unwind tension
- result of excessive unwind tension
- function of the "Dancer" roller on a web machine
- function of the PIV unit
- result of adjustments to the PIV
- function of the lay-on roller
- effect of excessive lay-on roller pressure
- effect of the web not being spliced correctly
- workings of the particular web viewing device
- OHS precautions that must be observed when setting up the delivery
- control of the web in the rewind unit
- result of incorrect rewind tension
- remedial steps that can be taken if there is a possibility of the ink marking in the rewind
- use of air blast play in the delivery of sheets
- OHS precautions that must be observed when preparing inks and additives
- details that are necessary to check an ink's suitability for the printing process
- special end-use requirements that may be necessary
- main function of a pigmented extender used in flexographic printing
- effect of adding plasticisers to flexographic inks
- other additives use in flexographic inks
- range in seconds for Zahn cup measurements
- effect foaming has in a Zahn cup when measuring the ink viscosity
- recommended pH range when printing with aqueous inks
- precautions that you observe to minimise waste when preparing the ink
- shelf life of most inks
- conditions that are relevant to the storage of inks and additives
- conventions that should be adhered to when labelling mixed inks
- OHS factors that need to be considered when setting up the machine
- advantage of centring all machine controls
- checks that should be made on cylinders and gears
- checks that should be performed prior to cylinder or sleeve installation
- angle that the chamber blades should be set
- main advantage of gauging up and dry register prior to printing a job

REQUIRED SKILLS AND KNOWLEDGE

- cell count of the anilox roller that is used when printing solids
- use of water treatment additives in a central impression drum and chill roller coolant system
- advantages of laser engraved ceramic anilox rollers
- things relating to the anilox roller that a roller scope will measure
- reasons for anilox wear
- type of job that would be printed using a hexagonal cell configuration
- recommended web temperature when printing polypropylene film
- method of drying that is used when printing on polythene by the flexographic process
- drying rate of liquid inks
- drying of aqueous inks
- operating range of UV lamps
- need to graduate the drying speeds of each progressive colour, so that first-down colours dry faster the subsequent colours
- in flexographic printing, the reason the colour strength increases as the press speed increases
- cause of a decrease in web tension
- result of increasing rewind tension after the roll has been partially rewound
- major cause of a telescopic roll
- print characteristics that are related to excessive printing pressure
- causes of picking when printing multicoloured work
- print faults that result from using an over-reduced ink
- problems that can cause lateral streaks showing up in uneven printing
- causes of moire patterns when printing by the flexographic process
- result of air being trapped under mounted plates
- instrument used to identify retained solvent trapped in the print
- purpose of taking Dyne readings
- purpose of the crinkle test when testing an ink
- result if an excessive final drying temperature was used when printing polypropylene film
- property of ink that can be adjusted to reduce dot gain
- effect of using the ink returning from the ink fountain when checking the viscosity for ink whilst using ink pumps
- problems that result from the excessive use of slow solvents
- effect of the "yield value" of ink on the ink transfer of halftone dots
- reason why laminating inks once printed appear dull and easy to scratch
- result of excessive print area tension
- problems which the printer may associate with cold seals
- machine manuals, safety and other documentation that are relevant to this task, where they are kept and information that is included in these documents

Evidence Guide

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.

Overview of assessment

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Evidence of the ability to:

- 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.

Guidance information for

Holistic assessment with other units relevant to the

EVIDENCE GUIDE**assessment**

industry sector, workplace and job role is recommended, for example:

- ICPPR413C Set up for complex flexographic printing
- ICPPR314C Produce complex flexographic printed product.

Range Statement

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.	
<i>Inks/coatings</i> may include:	range of inks commonly used in 4 or more colour printing, including standard and special colours.
<i>Substrate types</i> may include:	range of substrates within the major categories of paper, pressure sensitive material, board, corrugated board, plastics and related films, or metal.
<i>Colour matching systems</i> may include:	use of viscosity controls, densitometers and spectrophotometry.
<i>Machines</i> may include:	range of stack, in-line and central impression flexographic printing machines with manual, semi-automated, fully automated or computerised process control.
<i>Design</i> may include:	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.
<i>Substrate handling</i> may include:	wide and narrow reel delivery systems.
<i>Specialised</i> may include:	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.

Unit Sector(s)

Unit sector	
--------------------	--

Competency field

Competency field	Printing
-------------------------	----------

Co-requisite units

Co-requisite units		