



Australian Government

Department of Education, Employment and Workplace Relations

PMBPROD373B Draw optical fibre

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the operation and adjustment of optical fibre drawing machines and the solving of non-routine problems.

This competency is typically performed by advanced operators demonstrating some relevant theoretical knowledge and using a range of well-developed skills requiring some discretion and judgement.

Application of the Unit

Application of this unit

This competency applies to operators who are required to apply knowledge of materials, product purpose and processes to the operation of optical fibre drawing machines. The key factors are the production of material meeting quality standards and product requirements and the recognition and resolving of a range of routine and non-routine problems.

The operator will:

- check job sheets for work requirements
- recognise hazards and taking appropriate action
- start up and shut down optical fibre drawing equipment
- monitor optical fibre drawing equipment operation and report process variations
- check product for quality and conformity to specifications
- discard non-conforming products, ensuring re-use where possible
- identify and take action on routine process problems
- complete logs and reports.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

The required outcomes described in this unit contain applicable Employability Skills. The Employability Skills Summary of the qualification(s) in which this unit is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
1. Plan own work requirements.	1.1 Identify equipment and processes used for production process and upstream and downstream operations from production plan or request. 1.2 Identify materials required including additives. 1.3 Recognise hazards and take appropriate action. 1.4 Identify and check emergency stops, guards and controls. 1.5 Identify requirements for materials, quality, production and equipment checks. 1.6 Identify materials, waste management and housekeeping needs.
2. Check optical fibre drawing equipment set-up.	2.1 Determine equipment requirements. 2.2 Set process to specifications as required. 2.3 Check materials are correct. 2.4 Select appropriate dies (number and sizes) and arrange in correct production sequence. 2.5 Coat drawing rollers with alcohol to procedures. 2.6 Check speed, time, tension and wind-off speed to requirements. 2.7 Check optical fibre winding equipment settings and adjustments, including tensions and spool loading, to specifications. 2.8 Discard, or make adjustments to the process for, non-conforming materials. 2.9 Set up date, batch and materials markings to specifications, as required. 2.10 Complete other pre-start checks to procedures.
3. Operate and make adjustments to optical fibre drawing machine to procedures.	3.1 Check and load materials using correct manual handling methods. 3.2 Start up equipment and make adjustments to reach required settings. 3.3 Monitor controls/displays/terminals for production/process data. 3.4 Monitor product/process quality. 3.5 Maintain continuity of process.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
	3.6 Make adjustments to remedy faults and nonconformity to standard as required. 3.7 Collect and reprocess/discard scrap/trim and other materials. 3.8 Complete required workplace documentation/records. 3.9 Clean, adjust and lubricate equipment as required. 3.10 Pause or stop equipment in an emergency, as required.
4. Shut down equipment to procedures.	4.1 Shut down equipment as required. 4.2 Complete equipment cleanup, adjustments and waste management. 4.3 Place suitable guards, locks and notices to prevent inadvertent start-up.
5. Anticipate and solve problems.	5.1 Recognise a problem or a potential problem. 5.2 Determine problems needing priority action. 5.3 Refer problems outside area of responsibility to appropriate person, with possible causes. 5.4 Seek information and assistance as required to solve problems. 5.5 Solve problems within area of responsibility. 5.6 Follow through items initiated until final resolution has occurred.

Required Skills and Knowledge

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

Application of knowledge of the materials, equipment and process sufficient to recognise material and equipment conditions which may lead to out of specification production.

Knowledge of organization procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the optical fibre process. Application of approved hazard control, safety procedures, the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge as a basis for solving processing and material problems, including:

- products, materials and material characteristics
- function of optical fibre drawing equipment, components and ancillary equipment
- optical fibre drawing equipment and manufacturing processes
- behaviour of materials in relation to speed, temperature and tension
- impact of machine speed, tension and temperature during the production stages on product quality and output
- changes to materials in optical fibre drawing process
- waste management and importance of non-conforming materials
- impact of variations in raw materials and equipment operation in relation to final product
- changes to materials at various stages of production
- waste management and importance of non-conforming materials.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- make measurements when required and identify product out of specification
- identify and describe own role and role of others involved directly in the fibre optic drawing making process
- identify factors which may affect product quality or production output and appropriate remedies
- identify when the operator is able to rectify faults and when assistance is required.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms and production reports.

Basic numeracy is required, eg to determine how many 2 kg, 3 kg and 5 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, the range statement and the assessment guidelines for this training package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

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

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- identify critical materials properties and optical fibre drawing equipment characteristics in relation to the process requirements and the end product.

Consistent performance should be demonstrated. For example, look to see that:

- production quality and output standards are met consistently
- the process runs consistently and smoothly.

Assessment method and context

Assessment will occur on industrial optical fibre drawing equipment in a work-like environment.

Competence in this unit may be assessed:

- using an appropriate, industrial optical fibre drawing machine
- in a situation allowing for the generation of evidence of the ability to recognise, anticipate and respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

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. Add any 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.

Where reference is made to industry codes of practice and/or Australian/international standards, the latest version must be used.

Context

This competency applies to optical fibre drawing machines for the cable making industry. It includes the operation of all relevant additional equipment where that equipment is integral to the optical fibre drawing process.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- optical fibre drawing equipment and components, including dies, threading path, spools
- associated equipment, including manual handling equipment, welders, lubrication system, packaging and measuring equipment
- hand tools used in production process
- relevant personal protective equipment.

Hazards

Typical hazards include:

- temperature
- fibre breakages
- hazardous materials
- manual handling hazards
- equipment operations.

Problems

'Anticipate and solve problems' means resolve a wide range of routine and non-routine problems, using product and process knowledge to develop solutions to problems which do not have a known solution/a solution recorded in the procedures.

Typical process and product problems may include:

- routine and non-routine product fibre optic drawing faults - contamination, flaws in dies and preform, incorrect processes and temperatures, incorrect thickness of optical fibre
- equipment malfunctions
- variations in materials and/or contamination of materials
- processing problems.

Variables

Key variables to be monitored include:

- roller selection
- die size, number, positioning
- line speed
- temperature
- tension
- wind-off speed
- product integrity and general conformance to specification/sample.
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Unit Sector(s)

Not applicable.