



Australian Government

Department of Education, Employment and Workplace Relations

PMBPROD301C Draw wire

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit descriptor

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

The operator will:

- plan the job
- identify hazards and take appropriate action
- start up and shut down wire drawing equipment as required
- monitor equipment operation and correct process variations for materials, equipment or process variations and make appropriate adjustments
- discard non-conforming products, ensuring re-use where possible
- solve routine and non-routine wire drawing equipment and 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, 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 wire drawing process set-up.	2.1 Determine equipment requirements. 2.2 Check equipment settings and adjustments are as required. 2.3 Select appropriate dies (number and sizes) and arrange in correct production sequence. 2.4 Identify and check dies, capstans, head, wire reel pack and gears, replacing or maintaining as required. 2.5 Coat wire drawing capstan with lubricant to procedures. 2.6 Check materials are correct. 2.7 Check material spool sizes for conformity with requirements. 2.8 Discard, or make adjustments to the process for, non-conforming materials. 2.9 Thread new materials checking free operation through dies and secure fixing to reels or spools. 2.10 Conduct equipment and component checks to ensure safe and efficient operation to procedures. 2.11 Set up date, batch and materials markings as required. 2.12 Complete other pre-start checks to procedures.
3. Operate wire drawing process to procedures.	3.1 Operate wire drawing equipment, noting key variables. 3.2 Monitor controls/displays/terminals for

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.
	production/process data. 3.3 Monitor product/process quality. 3.4 Make adjustments to remedy faults and nonconformity as required. 3.5 Maintain continuity of process. 3.6 Collect and reprocess/discard scrap/trim and other materials. 3.7 Clean, adjust and lubricate equipment as required. 3.8 Complete required workplace documentation/records. 3.9 Pause equipment, 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 the enterprise's 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 wire drawing process. Application of approved hazard control, safety procedures, the use of PPE in relation to handling materials, equipment operation and clean-up.

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

- products, materials and material characteristics
- function of wire drawing equipment, equipment components and ancillary equipment
- impact of die wear and build up, faulty capstan and wire welds on product quality and production output
- wire drawing manufacturing processes
- behaviour of materials in relation to speed, temperature and tension
- waste management and importance of non-conforming materials
- wire properties and their interactions with process conditions
- relationships between wire properties and process conditions
- changes to wire properties to better suit process requirements
- product problems related to wire properties
- product problems related to process conditions
- adjustments to process conditions to meet wire and product requirements.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- maintain output and product quality using appropriate instruments, controls, test information and readings
- identify and describe own role and role of others involved directly in the wire drawing process
- identify factors which may affect product quality or production output and appropriate remedies
- identify when assistance is required to solve problems.

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 wire drawing process characteristics in relation to the process requirements and the end product
- plan own work process within workplace procedures and explain the reasons for the steps in the process
- take appropriate action to observe equipment, materials and products for out-of-specification results, make adjustments and identify problems to be reported.

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

- production quality and output standards are met consistently
- problems are anticipated from process observations
- problems are efficiently resolved
- the process runs consistently and smoothly.

Assessment method and context

Assessment will occur on an industrial wire drawing machine in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate, industrial wire drawing machine
- in a situation allowing for the generation of evidence of the ability to 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 the operation of all wire drawing equipment within the plastics, rubber and cablemaking industries. It includes the operation of all relevant additional equipment where that equipment is integral to the wire drawing process.

Procedures

All operations are performed in accordance with procedures.

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

Tools and equipment

This competency includes use of equipment and tools such as:

- wire drawing equipment and components, including die box, payoff, capstan, internal cooling system, annealer, tinner, accumulator, spooler, main drive, control unit, wire drawing dies (diamond, tungsten, carbide, compax)
- associated equipment, including manual handling equipment, pointers, taggers, welders, lubrication system, packaging
- measuring equipment
- hand tools used in production process
- relevant personal protective equipment.

Hazards

Typical hazards include:

- temperature
- 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:

- equipment malfunctions (eg wire breaks - raw material contamination, die wear, die build-up, faulty capstan bands, faulty wire welds)
- materials problems (eg incorrect quantity of materials, raw material contamination)
- processing problems (eg incorrect diameter, ovality, surface appearance, colour, inclusions, elongation, tensile strength, weight, wrap)

Variables

Key variables to be monitored include:

- machine speed
- lubrication
- wire quality.
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Unit Sector(s)

Not applicable.