



Australian Government

Department of Education, Employment and Workplace Relations

PMBPROD287B Weld plastics materials

Revision Number: 1

PMBPROD287B Weld plastics materials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the welding of plastics materials to specification using manual techniques and hand held equipment.

Application of the Unit

Application of this unit

This competency applies to operators who are required to weld plastic pipe and fabricated products to a product specification, maintaining personal safety and the safety of others within the context of production output and quality requirements. Welding may be undertaken to *ISO/TR 19480 Polyethylene pipes and fittings for the supply of gaseous fuels or water - Training and assessment of fusion operators* and/or Draft Australian Standard *WD00307 Qualification and certification of Plastics welding personnel* or its replacement.

This competency is typically performed by operators working either independently or as part of a work team. The key factors are the understanding of the processes used to weld plastics materials to form a homogenous joint created by a melt of plastics materials.

It includes:

- checking job sheets for work to be done and identifying the priority in which jobs/product will be made/completed
- setting up equipment
- preparing materials as required
- ensuring that safety procedures are applied to reduce the risks.

If materials need to be cut as part of the job then see also *PMBPROD240B Cut materials*.

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. Identify required materials and equipment.	1.1 Identify work requirements from production plan or request. 1.2 Identify quantity and quality of product required and any special requirements, including welding specifications. 1.3 Interpret plans, patterns, designs or product specifications. 1.4 Recognise hazards and steps required to ensure safety. 1.5 Plan sequence of welding operations for the whole process to ensure work follows a logical procedure. 1.6 Recognise requirements which may not be in accordance with usual practice. 1.7 Ask questions of appropriate person to confirm unusual practice. 1.8 Examine process requirements to identify suitability of plastics materials for manual welding operations.
2. Set up equipment and materials.	2.1 Set up tools and equipment ready for production. 2.2 Locate materials, patterns and consumables. 2.3 Ensure safety equipment is available and fit for use. 2.4 Identify non-conformances and take required action.
3. Weld to specification	3.1 Assemble components using clamps and jigs as required. 3.2 Organise materials and equipment prior to welding. 3.3 Weld materials to specification. 3.4 Collect and segregate scrap, trim and other materials as required. 3.5 Complete logs and records as required. 3.6 Keep equipment and work area clean.
4. Respond to routine problems in accordance with procedures.	4.1 Check finished welds or products against specifications 4.2 Recognise known faults that occur during the operation. 4.3 Identify and take action on causes of routine faults.

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
	4.4 Log problems as required. 4.5 Identify non-routine process and quality problems and take appropriate action.

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 of welded plastic joints or components such as:

- different types of materials and their behaviour when prepared and welded
- different welding equipment and procedures and suitability for material
- types of welds and ways of achieving them
- weld faults common with types of weld and materials welded
- welding symbols.

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

Competence includes the ability for the practical completion of the job to identify:

- equipment controls used in welding
- types of welders used
- routine faults in products
- routine problems in process.

Competence also requires the ability to determine the appropriate action (including reporting to the appropriate person) by distinguishing between causes of faults such as:

- materials
- changes to materials during the welding process
- equipment - adjustments/set-up
- equipment - maintenance requirements.

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.

Basic numeracy is also required to interpret specifications, make measurements and read and interpret process conditions.

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:

- recognise the importance of material properties and qualities in the welding process
- apply approved procedures
- respond to routine problems.

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

- welding production standards are met consistently
- upstream and downstream communication is timely and effective operating procedures and work instructions are read and interpreted correctly.

Assessment method and context

Assessment will occur on an industrial plastics welding machine(s) equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed

- by use of an appropriate, industrial plastics welding equipment requiring demonstration of operation
- 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 processes required to fabricate plastic products by welding or otherwise weld plastic materials or pipe to specified requirements. It includes welding the processes of:

- butt fusion welding
- electro fusion welding
- extrusion welding
- heated wedge welding
- high speed nozzle
- hot gas welding
- infrared welding
- socket fusion welding.

Materials may be from a range of thermoplastic materials for which a compatible welding polymer rod or filler can be provided to form a homogeneous melt. The material may be in any form: sheet, pipe, formed tube, solid section, formed profile, etc

It also includes the operation of hot air and other hand held welding equipment of various types and all relevant ancillary equipment. Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards

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:

- welding equipment
- hand tools as required
- jigs, clamps and other fixing devices
- relevant personal protective equipment

Hazards

Typical hazards include:

- fumes from overheating or poor ventilation
- cuts from sharp edges on components
- burns from manual handling
- eye injury
- power tools, leads and power supplies
- welding equipment, parts and attachments

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:

- pattern incorrect or inaccurate assembly or clamping
- incorrect filler rods selected
- poor surface preparation
- incorrect selection of welding nozzle or attachments

- moisture contacting welding devices
- burns to electrical leads
- sequencing problems, weld run too fast or too slow
- bonding problems, weld deposit incomplete or plastication not achieved.

Variables

Key variables to be monitored include:

- weld temperature
- feed rate of filler rod
- variations in materials being welded
- thickness of materials being welded.
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Unit Sector(s)

Not applicable.