



Australian Government

Department of Education, Employment and Workplace Relations

PMBWELD309B Weld plastic using extrusion techniques

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the extrusion (and injection) welding of PE, PP and other plastic components under industrial conditions both in the field and in factory conditions.

This competency is performed by operators as part of a work team.

Application of the Unit

Application of this unit

This competency applies to operators who are involved in the extrusion (and injection) thermal welding of PE, PP and other plastic components to quality assurance requirements whilst maintaining personal and immediate site safety.

The key features in attaining the required quality are:

- identifying materials being used in the installation as compatible for welding
- identifying appropriate welding conditions to be used
- maintaining and calibrating welding equipment
- performing welding
- assessing quality of welded joints made.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

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
1. Identify materials as being compatible for welding.	<p>Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.</p> <p>1.1 Identify materials as PE, PP, ABS, HIPS and PVC from specifications and worksite instructions.</p> <p>1.2 Identify plastic materials and components supplied as being compatible for welding from specifications and tests.</p>
2. Identify appropriate plastics welding conditions.	<p>2.1 Identify welding machine type and operating requirements.</p> <p>2.2 Identify plastic component materials and dimensions.</p> <p>2.3 Identify and select appropriate welding rods or granules.</p> <p>2.4 Select welding conditions for individual welding machines and plastic components.</p> <p>2.5 Prepare field operational sheets as per enterprise specification.</p>
3. Maintain, and calibrate welding equipment.	<p>3.1 Set up welding equipment and work area as per enterprise specification.</p> <p>3.2 Ensure safety equipment available and operational as per enterprise procedures.</p> <p>3.3 Identify non-conformance, report and rectify according to enterprise procedures.</p> <p>3.4 Check operation, and calibrate where required, heating, material feed rate and pressure systems.</p> <p>3.5 Use personal protective equipment.</p>
4. Perform welding to required standard.	<p>4.1 Clean machine, align and trim abutting plastic component ends as per job specification.</p> <p>4.2 Assemble components in holding jigs.</p> <p>4.3 Perform heating, welding and cooling phases using selected welding conditions and specifications.</p> <p>4.4 Monitor and record achieved weld conditions for each assembly as per enterprise requirements.</p> <p>4.5 Clean up equipment when completed as per enterprise requirements.</p> <p>4.6 Clean up work site, dispose of scrap materials as per job specification.</p>
5. Assess quality of	5.1 Identify quality requirements for joints as per

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.
completed joints.	specifications. 5.2 Assess joints against specification requirements, and report results according to enterprise requirements. 5.3 Identify and report non-conformances according to job specification.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit. Knowledge and understanding of PE, PP, ABS, HIPS and PVC materials and welding rods/granules as described in national standards to recognise welding compatibility and suitability

Knowledge of detailed work instructions necessary to perform extrusion and injection welding, and the ability to implement these within required parameters to attain required quality outcomes.

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

- identify substrate and welding materials being used
- identify welding conditions for individual machine types and component materials
- maintain and adjust operating conditions in welding machines
- set up and maintain safe working environment
- operate welding machines within required conditions
- assess quality of completed welded joints
- identify and rectify fault causes arising from machine operation and component variability
- establish and maintain quality records.

Language, literacy and numeracy requirements

Read material which is sequenced for instructions, explanations, information or opinions.

Write short and simple messages about routine tasks or activities, or complete forms.

Use hands-on real-life materials and pictures/diagrams based on personal experience and prior knowledge.

Use several pieces of related mathematical information.

Read, write and speak whole numbers and money sums, recognise and interpret simple fractions, decimals and percentages, use simple data, grid references.

Use simple grammatical forms and vocabulary to give instructions, give explanations, ask questions and express viewpoints.

Clarify intended meaning by asking for repetition when listening, and varying speed and changing tone or emphasis when speaking.

Use strategies such as providing verbal and non-verbal feedback in order to show interest or attitude.

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 the weld quality meets the requirements of the standard. This may require testing of the weld in accordance with the standard.

Consistent achievement of required quality standards is critical.

Assessment method and context

Assessment will occur using industrial plastic pipe/plate/sheet and welding equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- using appropriate, industrial equipment, situations and polymers
- 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 unit includes the extrusion and injection welding of PE, PP and other plastic components using electrical (or other) activated welding equipment.

It also includes the operation of all relevant ancillary equipment to assemble components prior to welding.

Specifications include Australian Standards, workplace specifications and instructions, and government codes and regulations.

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:

- electrical activated extrusion welding machines
- electrical/pneumatic activated injection welding machines
- measurement devices, including, timers, temperature probes and callipers
- cleaning fluids and wipes (eg isopropanol)
- plastics machining equipment
- assembly jigs and clamps
- relevant safety equipment
- comprehensive work instructions.

Hazards

Typical hazards include:

- hazardous cleaning fluids
- plastic sheet material handling
- heavy stationary and moving machinery
- cutting and heating components.

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:

- incompatible materials (pipes/rods)
- variable plastics sheet material grades and supplied welding rods/granules
- equipment malfunction or wear and tear
- variable factory and field site conditions.
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Unit Sector(s)

Not applicable.