Australian Government

Department of Education, Employment and Workplace Relations

PMBWELD302B Electrofusion weld polyethylene pipelines

Revision Number: 1

PMBWELD302B Electrofusion weld polyethylene pipelines

Modification History

Not applicable.

Unit Descriptor

Unit descriptor
This competency covers the electrofusion welding of polyethylene (PE) plastic pipes and pipeline 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 electrofusion of polyethylene (PE) pipes and pipeline 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
- calculating appropriate welding parameters to be used
- maintaining and calibrating welding equipment
- performing welding
- assessing quality of welded joints made.

End applications include pipelines for transmitting gas and liquids.

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 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 materials as being compatible for electrofusion welding.	1.1 Identify materials as polyethylene (PE) from specifications and work site instructions. 1.2 Identify PE materials and pipes supplied as being compatible for welding from specifications.
2. Identify compatibility of commercial electrofusion control systems.	2.1 Identify electrofusion welding control unit type and operating data. 2.2 Identify pipe material and dimension compatibility with electrofusion fittings. 2.3 Identify control unit compatibility with electrofusion fitting control.
3. Maintain and calibrate electrofusion control unit equipment.	3.1 Set up electrofusion welding equipment and work area as per enterprise procedures. 3.2 Ensure safety equipment is available and operational as per enterprise procedures. 3.3 Identify non-conformance, report and rectify according to enterprise procedures. 3.4 Determine equipment is operational according to specifications.
4. Perform electrofusion welding to required standard.	4.1 Prepare pipe and fitting as per specification. 4.2 Perform heating, welding and cooling phases using selected elecrofusion welding parameters. 4.3 Monitor and record achieved electrofusion weld parameters for each joint as per enterprise procedures. 4.4 Clean up equipment when completed as per enterprise procedures. 4.5 Clean up work site, dispose of scrap materials as per operational procedures.
5. Assess quality of completed electrofusion joints.	5.1 Identify quality requirements for electrofusion joints as per specifications. 5.2 Assess joints against specification requirements and report results. 5.3 Identify and report non-conformances according to enterprise requirements.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.
Knowledge and understanding of PE materials and pipeline components, as described in national standards, to recognise electrofusion welding compatibility, and suitability.
Knowledge of detailed work instructions necessary to perform electrofusion welding, and the ability to implement within required parameters to attain required quality outcomes.
Knowledge as a basis for solving processing and material problems, including:

- identify materials being used
- identify compatibility of commercial operating systems
- select electrofusion welding parameters for individual control units and fittings components
- prepare electrofusion joint assemblies
- set up and maintain safe working environment
- operate control unit within required parameters
- identify and rectify fault causes arising from machine operation and component variables
- establish and maintain quality records
- as relevant for the practical completion of work required.

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.

Assessment method and context

Assessment will occur using industrial plastic pipes and welding equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by use of appropriate, industrial equipment, situations and polymers
- in a situation allowing the generation of evidence of the ability to recognise, anticipate and solve problems
- by use of a suitable simulation and/or a range of case studies/scenarios
- by 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 electrofusion welding of polyethylene (PE) pipeline components using calibrated output electrofusion control units. The end applications include pipelines used for transmission of gaseous and water based fluids.

It also includes the operation of all relevant ancillary equipment.

Specifications include national standards for materials (including but not limited to AS/NZS 4129, AS/NZS 4130, AS/NZS4131 and AS/NZS 4401), 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:

- calibrated output electrofusion control units and pipe clamp supports
- measurement devices, including timers, temperature probes, callipers and computer based output monitors
- cleaning fluids, spray equipment and scrapers
- relevant safety equipment
- comprehensive work instructions.

Hazards

Typical hazards include

- hazardous cleaning fluids
- pipe 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:

- variable PE materials, and pipes as supplied
- equipment malfunction or wear and tear
- variable field site conditions.
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Unit Sector(s)

Not applicable.