



**Australian Government**

# **PMBWELD301 Butt weld polyethylene plastic pipelines**

**Release: 1**

# PMBWELD301 Butt weld polyethylene plastic pipelines

## Modification History

Release 1. Supersedes and is equivalent to PMBWELD301B Butt weld polyethylene plastic pipelines

## Application

This unit of competency covers the skills and knowledge required to butt weld polyethylene (PE) plastic pipelines. It applies to welding undertaken in the field and in factory conditions. Pipelines may be for transmission of gas or liquids.

This unit of competency applies to experienced operators who are required to calculate appropriate welding parameters to be used, set up equipment, perform butt weld, assess joints against specifications and solve problems within area of responsibility.

This unit of competency applies to an experienced operator demonstrating theoretical and technical knowledge and well developed skills in situations that require some discretion and judgement. The operator may work alone or as a member of a team or group and will work in liaison with other shift team members, team leader and supervisor, as appropriate.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

## Pre-requisite Unit

Nil

## Competency Field

Welding

## Unit Sector

Not applicable

## Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- |   |            |  |
|---|------------|--|
| <b>1 Identify materials as being compatible for welding</b> | <b>1.1</b> | Identify materials as polyethylene (PE) from specifications and work site instructions       |
|   | <b>1.2</b> | Identify PE materials and pipes supplied as being compatible for welding from specifications |

- |   |  |   |
|---|--|---|
| 2 | <b>Calculate appropriate pipe welding parameters</b> | <div>2.1 Identify welding machine type and operating data</div> <div>2.2 Identify pipe materials and dimensions</div> <div>2.3 Perform welding parameter calculations for individual welding machines and pipe details</div> <div>2.4 Prepare field operational sheets as per enterprise requirements</div>   |
| 3 | <b>Maintain and calibrate welding equipment</b>      | <div>3.1 Set up welding equipment and work area</div> <div>3.2 Ensure safety equipment is available and operational</div> <div>3.3 Identify non-conformance, report and rectify</div> <div>3.4 Check operation and calibrate where required, heating, trimming, and pressure systems</div>  |
| 4 | <b>Perform welding to required standard</b>          | <div>4.1 Assemble pipeline components in welding machine</div> <div>4.2 Clean, align and trim pipe ends</div> <div>4.3 Perform heating, welding, and cooling phases using calculated welding parameters</div> <div>4.4 Monitor and record achieved weld parameters for each joint according to enterprise requirements</div> <div>4.5 Clean up equipment when completed according to enterprise procedures</div> <div>4.6 Clean up work site, dispose of scrap materials according to enterprise procedures</div> <div>4.7 Use personal protective equipment (PPE) according to enterprise requirements</div> |
| 5 | <b>Assess quality of completed joints</b>            | <div>5.1 Identify quality requirements for joints</div> <div>5.2 Assess joints against specification requirements, and report results</div>   |

### 5.3 Identify and report non-conformances according to enterprise requirements

## Foundation Skills

This section describes those required skills (language, literacy and numeracy) that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

## Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

**Regulatory framework** The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used.

Applicable legislation, regulations, standards and codes of practice include:

- health, safety and environmental (HSE) legislation, regulations and codes of practice relevant to the workplace, manual handling and hazardous materials
- Australian/international standards relevant to the materials being used and products being made, including one or more of:
  - AS/NZS 4130:2009 Polyethylene (PE) pipes for pressure applications, or its replacement
  - AS/NZS 4131:2010 Polyethylene (PE) compounds for pressure pipes and fittings, or its replacement
  - AS/NZS 4401:2006 Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings - Polyethylene (PE), or its replacement
  - AS/NZS 5065:2005 Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications, or its replacement
  - ISO 21307:2011 Plastics pipes and fittings—Butt fusion jointing procedures for polyethylene (PE) pipes and fittings used in the construction of gas and water distribution systems or its replacement
- any relevant licence and certification requirements.

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state/territory or federal

legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and such requirements the legislative requirements take precedence.

**Procedures** All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, and include one or any combination of:

- emergency procedures
- work instructions
- standard operating procedures (SOPs)
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant.

**Tools and equipment**

Tools and equipment include:

- hydraulic activated butt welding machines
- pipe supports
- measurement devices, including one or more of:
  - pressure gauges
  - timers
  - temperature probes
  - callipers
  - computer-based pressure/temperature monitors
- cleaning equipment
- spray equipment.

Additional tools and equipment will be selected as required from:

- hand tools used in this process
- hoists/lifting equipment not requiring any special permits or licences
- manual handling, aids such as hand carts and trolleys
- relevant PPE.

**Hazards** Hazards must be identified and controlled. Identifying hazards requires consideration of:

- power tools, leads and power supplies
- hazardous products and materials
- cutting equipment
- sharp edges, swarf and scrap
- protrusions or obstructions
- slippery surfaces, spills or leaks
- rotational equipment or vibration
- smoke, dust, vapours or other atmospheric hazards
- high temperatures
- electricity
- gas
- gases and liquids under pressure
- structural hazards
- equipment failures
- machinery, equipment and product mass
- other hazards that might arise.

**Problems**      Routine and non-routine problems must be resolved.

Non-routine problems must be resolved by applying operational knowledge to develop new solutions, either individually or in collaboration with relevant experts, to:

- determine problems needing action
- determine possible fault causes
- develop solutions to problems which do not have a known solution
- follow through items initiated until final resolution has occurred
- report problems outside area of responsibility to designated person.

Non-routine problems are unexpected problems or variations of previous problems and include one or more of:

- variations in quality
- emergency situations
- intermittent faults.

Operational knowledge includes one or more of:

- procedures
- training
- technical information, such as journals and engineering specifications
- remembered experience

- relevant knowledge obtained from appropriate people.

Routine problems are predictable and have known solutions and include one or more of:

- variable PE materials and pipes as supplied
- equipment malfunction or wear and tear
- variable field site conditions.

## Unit Mapping Information

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## Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=932aacef-7947-4c80-acc6-593719fe4090>