



Australian Government

PMBWELD311 Design high temperature plastic pressure pipelines

Release: 1

PMBWELD311 Design high temperature plastic pressure pipelines

Modification History

Release 1. Supersedes and is equivalent to PMBWELD311B Design high temperature plastic pressure pipelines

Application

This unit of competency covers skills and knowledge required to design relevant elements of plastics pressure pipes and pipeline components operating under high temperature industrial conditions in the field.

This unit of competency applies to experienced operators who are required to select suitable materials, components and designs for specific high temperature pressure applications of plastic pipes and pipelines to quality assurance requirements, including specifying appropriate testing and commissioning procedures. The end application includes pipelines for transmitting high pressure water-based fluids at elevated temperatures.

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

PMBWELD307 Install high temperature plastic pressure pipelines

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.

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|---|--|-----|---|
| 1 | Identify plastic pipe materials as being suitable for specific high temperature pressure applications | 1.1 | Identify suitable plastic materials from national standards, job specifications and work site instructions |
| | | 1.2 | Determine plastics material properties from national standards and material data sheets |
| | | 1.3 | Identify job needs from work site instructions and specifications |
| 2 | Determine appropriate products from national standards | 2.1 | Identify material options from national standards, supplier data sheets, and government codes and regulations |
| | | 2.2 | Identify performance limitations of material options |
| | | 2.3 | Identify pipe and component options from national standards, supplier data sheets, and government codes and regulations |
| | | 2.4 | Identify performance limitations pipe and component options |
| | | 2.5 | Identify suitable jointing methods for pipes and fittings |
| | | 2.6 | Identify operational conditions |
| 3 | Determine pipeline requirements | 3.1 | Identify length of pipe required |
| | | 3.2 | Identify fittings and number of fittings required |
| | | 3.3 | Select pipe and components considering specific job needs and product properties |
| | | 3.4 | Identify required jointing equipment or materials |
| | | 3.5 | Prepare field operational sheets |
| 4 | Determine appropriate testing and commissioning procedures | 4.1 | Determine specific installation test requirements |
| | | 4.2 | Identify alternative test procedures to meet requirements |
| | | 4.3 | Maintain quality records |

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 2642.2:2008 Polybutylene (PB) plumbing pipe systems - Polybutylene (PB) pipe for hot and cold water applications or its replacement
 - AS/NZS 2642.3:2008 Polybutylene (PB) plumbing pipe systems - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications or its replacement
 - AS/NZS 2492:2007 Cross-linked polyethylene (PE-X) pipes for pressure applications or its replacement
 - AS 4176.1-2010 Multilayer pipes for pressure applications - Multilayer piping systems for hot and cold water plumbing applications – General other relevant parts of AS 4176 and their replacements
- 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.

Joining Joining methods include one or more of:

- methods**
- mechanical
 - chemical bond
 - thermal fusion.

- Installation** Installation can be one or more of:
- above ground
 - below ground.

- 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.

- Problems** Problems include one or more of:
- limitations on the available PE materials, pipes and components
 - variable field site conditions
 - limitations in available data on specific job requirements
 - emergency situations.

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMBWELD311B Design high temperature plastic pressure pipelines

Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for PMBWELD311 Design high temperature plastic pressure pipelines

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and demonstrate the ability to:

- read and interpret procedures, national standards, job specifications, material labels and safety data sheets (SDS)
- identify suitable plastics materials for specific high temperature high pressure applications
- identify alternative jointing methods appropriate to the materials
- determine material requirements
- determine plastic high temperature pressure pipeline components
- prepare field operational sheets describing requirements and layout of plastic high temperature pressure pipelines
- determine testing and commissioning requirements.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and demonstrate knowledge of:

- safe working requirements
- plastics materials and high temperature pressure pipeline components as described in national standards, sufficient to recognise suitability for specific application and to establish work instructions
- information sources on suitable types of plastics materials and components
- selection requirements for plastics high temperature pressure pipeline components
- factors which may affect product quality or production output and appropriate remedies
- installation site variables
- organisation procedures relevant to the work environment/job role
- commissioning requirements and tests
- hazards that may arise in the job/work environment the range of possible causes, potential consequences and appropriate risk controls.

Assessment Conditions

- The unit should be assessed holistically and the judgement of competence shall be based on a holistic assessment of the evidence.

- The collection of performance evidence:
 - should occur over a range of situations
 - will typically include a supervisor/third-party report or other evidence, focusing on consistent performance and problem recognition and solving. A supervisor/third-party report must be prepared by someone who has a direct, relevant, current relationship with the person being assessed and who is in a position to form a judgement on workplace performance relevant to the unit of competency
 - may use industry-based simulation for all or part of the unit particularly where safety, lack of opportunity or significant cost is an issue.
- Assessment should occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process, such as workbooks, written assessments or interviews.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications associated with this unit.
- The regulatory framework will be reflected in workplace policies and procedures and is not required to be independently assessed.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- In addition the assessor or anyone acting in subject matter expert role in assessment shall demonstrate both technical competency and currency. If the assessor cannot demonstrate technical competency and currency they shall assess with a subject matter expert who does meet these requirements.
- Technical competence can be demonstrated through one or more of:
 - relevant VET or other qualification/Statement of Attainment
 - appropriate workplace experience
 - appropriate workplace experience supervising/evaluating the type of work being assessed
- Currency can be demonstrated through one or more of:
 - being currently employed undertaking the type of work being assessed
 - being employed by the organisation undertaking the type of work being assessed and having maintained currency
 - having consulted/had contact with an organisation undertaking the type of work being assessed within the last twelve months, the consultation/contact being related to assessment

- conducting on the job training/assessments of the type of work being assessed.

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