



Australian Government

PMBWELD307 Install high temperature plastic pressure pipelines

Release: 1

PMBWELD307 Install high temperature plastic pressure pipelines

Modification History

Release 1. Supersedes and is equivalent to PMBWELD307B Install high temperature plastic pressure pipelines

Application

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

This unit of competency applies to experienced operators who are involved in the installation of pipes and pipeline components to quality assurance requirements whilst maintaining personal and immediate site safety. They are required to confirm that materials are suitable for the specific pressure applications; prepare for and perform jointing, repairs and service of plastic pressure pipes and pipeline components; 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.

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|---|-------------------------|-----|---|
| 1 | Identify plastic | 1.1 | Identify plastic materials from national standards, job |
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	pipe materials as being suitable for specific pressure applications		specifications and work site instructions
		1.2	Determine plastic material properties from national standards and material data sheets
		1.3	Identify job needs from work site instructions and specifications
2	Identify applications for alternative jointing technologies	2.1	Identify properties and limitations of mechanical jointing systems
		2.2	Identify properties and limitations of thermal welding jointing systems
		2.3	Identify properties and limitations of chemical bonding jointing systems
		2.4	Perform trial jointing for mechanical jointing and thermal fusion methods, identify non-conformance, report and rectify
		2.5	Assess quality against specification requirements
3	Determine requirements for working with of plastics pipeline components	3.1	Identify requirements for handling and transport of plastics materials
		3.2	Determine requirements for long-term storage
		3.3	Determine requirements for installation including additional materials
4	Connect and repair plastic pressure pipelines	4.1	Determine connection requirements
		4.2	Identify possible alternative material connection methods to meet specified requirements
		4.3	Connect pipework to meet requirements
		4.4	Determine repair requirements
		4.5	Identify alternative repair options
		4.6	Repair installation to meet requirements

5	Assess quality of completed installation	5.1	Test installation
		5.2	Identify alternative test procedures to meet requirements
		5.3	Assess quality of completed installation
		5.4	Refer problems outside area of responsibility to appropriate person
		5.5	Solve problems within area of responsibility
		5.6	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.
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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.

Plastic pressure pipe materials Plastic pressure pipe materials include:

- polybutylene (PB)
- polypropylene (PP)
- cross linked polyethylene (PEX)
- A1/PEX composites
- polyvinylidene fluoride (PVDF)
- chlorinated polyvinyl chloride (CPVC).

Joining methods Joining methods for installers include one or more of:

- mechanical
- thermal
- chemical bond.

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.

Tools and equipment

Tools and equipment include one or more of:

- jointing equipment
- service connection and repair equipment
- jigs and fixtures
- calculators
- 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 safety equipment
- relevant personal protective equipment (PPE).

Measurement devices

Measurement devices include one or more of:

- pressure gauges
- timers
- callipers
- temperature probes
- computer-based monitors.

Hazards

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

- pipe material handling
- heavy stationary and moving machinery
- cutting and heating equipment
- hazardous products and materials
- 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

Problems include one or more of:

- variable PE materials, pipes and components as supplied
- equipment malfunction or wear and tear
- variable field site conditions
- limitations in available data on specific job requirements
- variations in quality
- emergency situations
- intermittent faults.

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>

Assessment Requirements for PMBWELD307 Install 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 materials being used in the installation as being suitable for specific applications
- identify applications for alternative jointing technologies
- determine appropriate methods of handling, storage and transport of PB, PEX, PP, A1/PEX composites, PVDF and CPVC plastics components
- select and perform mechanical and chemical jointing methods to meet specifications
- perform trial jointing
- monitor key variables, including:
 - alignment
 - materials and conditions for joint
 - integrity of joint
 - general conformance to specification
- determine service connection requirements and make connections
- determine repair requirements and make repairs
- assess quality of completed installation
- make adjustments to remedy faults and non-conformity
- apply safety procedures
- apply housekeeping procedures
- apply waste management procedures
- recognise early warning signs of equipment/processes needing attention or with potential problems
- distinguish between causes of problems, including:
 - operational problems
 - materials properties
 - process variables
 - procedural errors
- recognise and prioritise problems requiring action
- resolve routine and non-routine problems
- communicate effectively with team/work group and supervisors

- complete workplace records
- do basic calculations, including additions, subtractions, divisions, fractions and percentages.

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
- PB, PP, PEX A1/PEX, PVDF and CPVC materials and pipeline components as described in national standards to recognise suitability for specific installation
- range of methods relevant to types of materials/components for:
 - mechanical jointing
 - chemical bonding
 - service connections
 - repairs
- factors which may affect product quality or production output and appropriate remedies
- storage, handling and transport procedures for PE equipment
- quality requirements and tests
- routine and non-routine problems that may arise, the range of possible causes and appropriate actions
- organisation procedures relevant to the work environment/job role
- hierarchy of control
- 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
 - must include the use of appropriate industrial equipment requiring demonstration of operation, start and stop procedures and responding to problems
 - 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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