



Australian Government

Department of Education, Employment and Workplace Relations

PMBWELD311B Design high temperature plastic pressure pipelines

Revision Number: 1

PMBWELD311B Design high temperature plastic pressure pipelines

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the designing of relevant elements of PB, PEX, PP, A1/PEX composites, PVDF and CPVC plastics pressure pipes and pipeline components operating under high temperature industrial conditions in the field.

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 design of relevant elements of PB, PEX, PP, A1/PEX composites, PVDF and CPVC plastics pressure 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 being suitable for specific applications
- determining the appropriate products from relevant national standards for the specific application
- assessing quality of completed installations by determining appropriate testing and commissioning procedures.

End application includes pipelines for transmitting high pressure liquids and gases.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has the prerequisite of *PMBWELD307B Install high temperature plastic pressure pipelines*.

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 PB, PP, PEX, A1/PEX composites, PVDF and CPVC pipe materials as being suitable for specific pressure applications.	1.2 Identify materials from national standards, job specifications and worksite instructions. 1.2 Determine 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 material option performance limitations. 2.3 Perform material selection contrasting specific job needs and product properties. 2.4 Prepare field operational sheets.
3. Assess quality of completed installation by determining appropriate testing and commissioning procedures.	3.1 Determine specific installation test requirements. 3.2 Identify alternative test procedures to meet requirements.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Knowledge and understanding of PB, PP, PEX A1/PEX, PVDF and CPVC materials and pipeline components as described in national standards to recognise suitability for specific application, and to establish work instructions.

Knowledge of detailed work instructions necessary to design high pressure pipelines, and to implement requirements to attain required quality outcomes.

Competence includes the ability to:

- identify individual types of materials and components being used
- establish specific job needs
- establish product selection
- set up and maintain safe working environment
- establish installation requirements
- identify and rectify fault causes arising from application and component variability
- establish completion test requirements
- 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 design meets the requirements of the standard.

Assessment method and context

Assessment will occur using industrial PB, PEX, PP, Al/PEX composites, PVDF, CPVC and other relevant plastic pipes and components and equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by use of an 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 design of relevant elements of polybutylene (PB), polypropylene (PP), crosslinked polyethylene (PEX), Al/PEX composites, polyvinylidene fluoride (PVDF) and chlorinated PVC (CPVC) pressure pipeline components. The end applications include pipelines used for transmission of water based fluids at elevated temperatures.

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. These may include

- AS/NZS 2642
- AS/NZS 2492
- AS/NZS 4176.

Tools and equipment

This competency includes use of equipment and tools such as:

- measurement devices including pressure gauges, times, temperature probes, calipers, and computer based monitors
- calculators
- relevant safety equipment
- comprehensive work instructions.

Hazards

Typical hazards include:

- high pressure fluids
- 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 material, and pipes and components as supplied
- variable field site conditions
- limitations in available data on specific job requirements.
-

Unit Sector(s)

Not applicable.