



Australian Government

CPCPCM3022A Weld polyethylene and polypropylene pipes using fusion method

Release 1

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Modification History

Prerequisite unit updated

Changes to unit title, descriptor, application, performance criteria, required skills and knowledge, range statement and critical aspects

Not equivalent to CPCPCM3012A

Unit Descriptor

This unit of competency specifies the outcomes required to fusion weld polyethylene (PE) and polypropylene (PP) (approved as per Australian standards) polymer pipes, and test joints in polymer pipe up to DN100 for water, sanitary and stormwater application only.

Application of the Unit

This unit of competency supports development of skills for polymer pipe welding using a variety of fusion techniques.

Site location for work application may be either domestic or commercial and may be a new work site or an existing structure being renovated, extended, restored or maintained.

Licensing/Regulatory Information

In some jurisdictions, this unit of competency may form part of accreditation, licensing, legislative, regulatory or certification requirements.

Pre-Requisites

CPCPCM2043A Carry out WHS requirements

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

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|---|--------------------------------|---|
| 1 | Prepare for work. | <p>1.1 Plans and specifications are obtained from job supervisor and job requirements.</p> <p>1.2 <i>Work health and safety</i> (WHS) and <i>environmental requirements</i> associated with the fusion welding of polymer pipes are adhered to throughout the work.</p> <p>1.3 <i>Quality assurance requirements</i> are identified and adhered to according to workplace requirements.</p> <p>1.4 Tasks are planned and sequenced in conjunction with others involved in or affected by the work.</p> <p>1.5 Materials, welding parameters and techniques are identified as required.</p> <p>1.6 <i>Tools, equipment</i> and <i>materials</i> for the fusion welding of approved polymer pipes, including personal protective equipment (PPE), are selected and checked for serviceability.</p> <p>1.7 Work area is prepared to support efficient fusion welding of approved polymer pipes.</p> <p>1.8 <i>Sustainability principles and concepts</i> are observed when preparing for and undertaking work process.</p> |
| 2 | Identify welding requirements. | <p>2.1 <i>Welding requirements</i> are identified from plans and specifications or given information.</p> <p>2.2 Welding equipment is assembled and checked for correct operation according to manufacturer instructions.</p> |

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| 3 | Weld and pressure test pipes. | 3.1 | Joints are prepared using tools and techniques according to standards and manufacturer specifications. |
| | | 3.2 | Test welds are undertaken and verified according to job specifications. |
| | | 3.3 | Fusion welds are carried out according to standards, plans, and job and manufacturer specifications. |
| | | 3.4 | Fusion welds are visually inspected for compliance with standards and manufacturer specifications. |
| | | 3.5 | Pipe joints are pressure tested and inspected according to standards and job specifications. |
| | | 3.6 | Test details and monitored results are checked for accuracy and documented according to requirements of regulatory authority and plans and specifications. |
| | | | |
| 4 | Clean up. | 4.1 | Work area is cleared and materials disposed of, reused or recycled according to legislation, regulations, codes of practice and job specification. |
| | | 4.2 | Tools and equipment are cleaned, checked, maintained and stored according to manufacturers' recommendations and workplace procedures. |
| | | 4.3 | Information is accessed and documentation completed according to workplace requirements. |

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to:
 - access information
 - determine requirements
 - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
 - follow instructions
 - use language and concepts appropriate to cultural differences
 - use and interpret non-verbal communication, such as hand signals
- initiative and enterprise skills to identify and report to appropriate personnel any faults in tools, equipment or materials
- literacy skills to:
 - complete workplace documentation
 - read and interpret:
 - plans and specifications
 - documentation from a variety of sources
 - record material quantities
- numeracy skills to apply measurements and calculations
- planning and organising skills to:
 - plan and sequence tasks with others
 - plan and set out work
- teamwork skills to work with others to action tasks and relate to people from a range of cultural and ethnic backgrounds and with varying physical and mental abilities
- technical skills to:
 - prepare surfaces in line with the material selected and the chosen weld technique
 - fusion welding, visual inspection and testing joints in approved polymer pipes up to DN100
- technology skills to:
 - access and understand site-specific instructions in a variety of media
 - use mobile communication technology

Required knowledge

- dangers associated with fusion welding of polymer pipe

- effect of heat on the properties of polymer pipe
- job safety analysis (JSA) and safe work method statements (SWMS)
- operating principles of fusion welding equipment
- organisational quality procedures and processes within the context of fusion welding of polymer pipe
- relevant WHS regulations and PPE requirements
- SI system of measurement
- surface preparation in the welding process

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

This unit of competency could be assessed in the workplace or a close simulation of the workplace environment providing that simulated or project-based assessment techniques fully replicate plumbing and services workplace conditions, materials, activities, responsibilities and procedures.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of:

- locating, interpreting and applying relevant information, standards and specifications to perform fusion welding of approved polymer pipes
- applying safety requirements throughout the work sequence, including electrical safety requirements and the use of personal protective clothing and equipment
- given the plans and specifications, butt fusion welding two joints and electro-fusion weld one socket joint up to DN100 on approved polymer pipes, using appropriate fusion welding processes and a visual inspection to manufacturer recommendations or other approved methods, ensuring:
 - application of sustainability principles and concepts
 - correct identification of requirements and details of proposed cuts
 - correct selection and use of appropriate processes, tools and equipment
 - completing all work to specification
 - compliance with regulations, standards and organisational quality procedures and processes
 - communicating and working effectively and safely with others.

Context of and specific resources for assessment

This competency is to be assessed using standard and authorised work practices, safety requirements and

environmental constraints.

Assessment of essential underpinning knowledge will usually be conducted in an off-site context.

Assessment is to comply with relevant regulatory or Australian standards' requirements.

Resource implications for assessment include:

- an induction procedure and requirement
- realistic tasks or simulated tasks covering the minimum task requirements
- relevant specifications and work instructions
- tools and equipment appropriate to applying safe work practices
- support materials appropriate to activity
- workplace instructions relating to safe work practices and addressing hazards and emergencies
- material safety data sheets
- research resources, including industry-related systems information.

Reasonable adjustments for people with disabilities must be made to assessment processes where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Method of assessment

Assessment methods must:

- satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package
- include direct observation of tasks in real or simulated work conditions, with questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application
- reinforce the integration of employability skills with workplace tasks and job roles
- confirm that competency is verified and able to be transferred to other circumstances and environments.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace

- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice, with a decision on competency only taken at the point when the assessor has complete confidence in the person's demonstrated ability and applied knowledge
- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence.

Assessment processes and techniques should as far as is practical take into account the language, literacy and numeracy capacity of the candidate in relation to the competency being assessed.

Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

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. Bold italicised wording, if used in the performance criteria, is detailed below. 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) may also be included.

Work health and safety is to be according to commonwealth, state and territory legislation and regulations and may include:

- handling of materials
- hazard control
- hazardous materials and substances
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and practices
- safe operating procedures, including recognising and preventing hazards associated with:
 - dangerous materials
 - electricity
 - surrounding structure and facilities
 - trip hazards
 - use of polymer pipe welding equipment

- work site visitors and the public
- working in confined spaces
- working in proximity to others
- use of firefighting equipment
- use of first aid equipment
- use of tools and equipment
- workplace environment and safety.

Environmental requirements cover:

- air pollution precautions
- clean-up protection
- waste management.

Quality assurance requirements may include:

- Environment Protection Authority (EPA)
- environmental policy
- commonwealth, state or territory, and local authorities administering applicable Acts, regulations and codes of practice
- industry guidelines
- internal company quality assurance policy and risk management strategy
- International Standards Organisation
- statutory requirements
- site safety plan
- workplace operations and procedures.

Tools and equipment may include:

- approved polymer welding equipment
- approved surface preparation equipment and material
- hand and power tools
- measuring equipment.

Materials may include:

- polyethylene
- polypropylene
- polybutylene.

Sustainability principles and concepts:

- cover the current and future social, economic and environmental use of resources
- may include:
 - appropriate material selection to ensure minimal

environmental impact

- efficient use and recycling of material
- efficient energy usage
- disposing of waste material to ensure minimal environmental impact.

Welding requirements may include:

- identifying pipe diameters
- identifying welding machine type and operating data
- materials and pipes supplied being compatible for welding from specifications
- preparation according to pipe manufacturer specifications
- welding temperature, welding time and cooling time according to manufacturer specifications.

Information may include:

- charts and hand drawings
- instructions issued by authorised organisational or external personnel
- manufacturer specifications and instructions
- material safety data sheets (MSDS)
- memos
- organisation work specifications and requirements
- plans and sketches
- regulatory and legislative requirements, particularly those pertaining to:
 - WHS and environmental requirements
 - plumbing regulations
 - relevant Australian standards
- safe work procedures relating to the fusion welding of approved polymer pipes
- signage
- verbal, written and graphical instructions
- work bulletins
- work schedules, plans and specifications.

Unit Sector(s)

Functional area

Unit sector Plumbing and services

Custom Content Section

Not applicable.