Australian Government

Department of Education, Employment and Workplace Relations

# CPCPCM3013A Fabricate and install non-ferrous pressure piping

**Release: 1**

# CPCPCM3013A Fabricate and install non-ferrous pressure piping

## Modification History

Not Applicable

## Unit Descriptor

**Unit descriptor** This unit of competency specifies the outcomes required to determine installation requirements and to fabricate, install and test non-ferrous pressure pipe.

## Application of the Unit

**Application of the unit** 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.

The unit also applies to low pressure applications (including refrigerant gases) and food processing applications.

## Licensing/Regulatory Information

Not Applicable

## Pre-Requisites

**Prerequisite units**

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| CPCPCM2023A | Carry out OHS requirements |

# Employability Skills Information

**Employability skills** This unit contains employability skills.

# Elements and Performance Criteria Pre-Content

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| 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

| ELEMENT | PERFORMANCE CRITERIA |
|---|---|
| 1. Prepare for work. | 1.1. Plans and specifications and any special instructions are obtained.<br>1.2. ***Safety*** (***OHS***) requirements associated with the fabrication and installation of non-ferrous pressure piping, and workplace ***environmental requirements***, are adhered to throughout the work.<br>1.3. ***Quality assurance*** requirements are identified and adhered to in accordance with workplace requirements.<br>1.4. Tasks are planned and sequenced in conjunction with others involved in or affected by the work.<br>1.5. ***Tools and equipment***, including personal protective equipment, are selected and checked for serviceability.<br>1.6. Work area is prepared to support efficient fabrication and installation of non-ferrous pressure piping. |
| 2. Identify installation requirements. | 2.1. Pipework configuration is identified from authorities' requirements, plans and specifications.<br>2.2. Position of ***pipes*** and equipment is determined from plans and specifications, site requirements and so as not to cause damage or interference to surrounding structures or fittings.<br>2.3. Measurements for fabrication or assembly are determined and transferred.<br>2.4. Quantity and type of ***materials*** required are calculated from plans and specifications in accordance with regulatory authorities and workplace requirements.<br>2.5. Materials are identified, ordered and collected in accordance with workplace procedures.<br>2.6. Materials are checked for compliance with docket and order form, and for acceptable condition. |
| 3. Fabricate, install and test pipe system. | 3.1. System is set out in compliance with design drawings or instructions.<br>3.2. Fixings and supports are installed to manufacturer requirements, job plans, specifications and workplace requirements.<br>3.3. Pipe system is fabricated and jointed in accordance with job plans and specification, and manufacturer requirements for mechanical type joints. |

| ELEMENT | PERFORMANCE CRITERIA |
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| | 3.4. Pipe system is installed in specified location without damage or distortion to pipework or surrounding environment or other services. |
| | 3.5. Pipe system is tested and documented to comply with job specification, authorities' requirements, standards, codes of practice and workplace requirements. |
| 4. Clean up. | 4.1. Work area is cleared and materials disposed of or recycled in accordance with state or territory ***statutory and regulatory authority*** legislation and workplace procedures. |
| | 4.2. Tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturer recommendations and workplace procedures. |
| | 4.3. ***Information*** is accessed and documentation completed in accordance with workplace requirements. |

# Required Skills and Knowledge

## REQUIRED SKILLS AND KNOWLEDGE

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

### Required skills

Required skills for this unit are:

- communication skills to:
  - access information
  - complete workplace documentation
  - determine requirements
  - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
  - follow instructions
  - plan and sequence tasks with others
  - read and interpret:
    - drawings and specifications
    - documentation from a variety of sources
  - record material quantities

## REQUIRED SKILLS AND KNOWLEDGE

- use language and concepts appropriate to cultural differences
- use and interpret non-verbal communication, such as hand signals
- identifying and accurately reporting to appropriate personnel any faults in tools, equipment or materials
- joining non-ferrous pipe materials by mechanical and manual means, the prefabrication of components and the fixing and testing of the system for soundness
- numeracy skills to apply measurements and calculations
- organisational skills, including the ability to 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
- technological skills to:
  - access and understand site-specific instructions in a variety of media
  - use mobile communication technology.

### Required knowledge

Required knowledge for this unit is:

- accessing information and the processes for calculating material requirements
- fabrication, installation and testing process for non-ferrous pressure pipe systems
- job safety analysis (JSA) and safe work method statements (SWMS)
- properties and characteristics of conveyed materials, including pressure, flow rates and temperature implications
- relevant statutory authority requirements and standards related to the fabrication, installation and testing of non-ferrous pressure pipe systems
- SI system of measurements
- workplace and equipment safety requirements.

# Evidence Guide

## 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 for the determination of requirements, fabrication, installation and testing of non-ferrous pressure pipe systems
- applying safety requirements throughout the work sequence, including the use of personal protective clothing and equipment
- as a minimum the ability to, given the plans and specifications, fabricate, install and test a DN20 copper line from a supply point to outlets with two changes in direction, using both silver brazing and mechanical joints supported and clipped in accordance with relevant standards and with a branch to be fabricated for testing purposes, as well as branches connecting at least two other non-ferrous materials, ensuring:
  - diameters are correct and system is manufactured to required dimensions and branches, bends and flanges are square
  - correct identification of design and details of proposed non-ferrous pressure pipe system
  - correct selection and use of appropriate processes, tools and equipment
  - completing all work to specification
  - compliance with regulations, standards and organisational quality procedures and

## EVIDENCE GUIDE

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| | processes<br>• 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.<br><br>Assessment of essential underpinning knowledge will usually be conducted in an off-site context.<br><br>Assessment is to comply with relevant regulatory or Australian standards' requirements.<br><br>Resource implications for assessment include:<br>• an induction procedure and requirement<br>• realistic tasks or simulated tasks covering the minimum task requirements<br>• relevant specifications and work instructions<br>• tools and equipment appropriate to applying safe work practices<br>• support materials appropriate to activity<br>• workplace instructions relating to safe working practices and addressing hazards and emergencies<br>• material safety data sheets<br>• research resources, including industry related systems information.<br><br>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:<br>• satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package<br>• 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<br>• reinforce the integration of employability skills |

**EVIDENCE GUIDE**

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

**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

## RANGE STATEMENT

regional contexts) may also be included.

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| ***Safety*** (***OHS***) is to be in accordance with commonwealth, state and territory legislation and regulations and may include: | • handling of materials<br>• hazard control<br>• hazardous materials and substances<br>• protective clothing and equipment prescribed under legislation, regulations and workplace policies and practices<br>• safe operating procedures, including recognising and preventing hazards associated with:<br>  • use of fabrication tools and equipment<br>  • dangerous materials<br>  • service lines<br>  • surrounding structure and facilities<br>  • traffic control<br>  • trip hazards<br>  • work site visitors and the public<br>  • working at heights<br>  • working in proximity to others<br>• use of firefighting equipment<br>• use of first aid equipment<br>• workplace environment and safety. |
| ***Environmental requirements*** include: | • clean-up protection<br>• waste management. |
| ***Quality assurance*** requirements may include: | • Australian standards<br>• Environment Protection Authority (EPA)<br>• internal company quality assurance policy and risk management strategy<br>• International Standards Organisation<br>• site safety plan<br>• workplace operations and procedures. |
| ***Tools and equipment***: | • include:<br>  • hand and power tools<br>  • heating equipment<br>  • ladders<br>  • mechanical bending equipment<br>  • silver brazing equipment<br>  • testing equipment<br>• may include: |

## RANGE STATEMENT

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| | • elevated work platforms<br>• lifting and load shifting equipment, including:<br>  • chain blocks<br>  • forklifts<br>  • hand trolleys<br>  • hoists and jacks<br>  • rollers<br>  • scaffolding. |
| ***Pipes*** may convey: | • compressed air<br>• condensate<br>• fuel oil<br>• medical gas<br>• water and other liquids. |
| ***Materials*** may include: | • aluminium tubes<br>• copper<br>• copper alloy<br>• polymer pipes<br>• stainless steel<br>• other approved materials. |
| ***Statutory and regulatory authorities*** include: | • state or territory statutory authority<br>• statutory plumbing authority. |
| ***Information*** may include: | • charts and hand drawings<br>• diagrams or sketches<br>• instructions issued by authorised organisational or external personnel<br>• manufacturer specifications and instructions<br>• material safety data sheets (MSDS)<br>• memos<br>• organisation work specifications and requirements<br>• regulatory and legislative requirements, particularly those pertaining to:<br>  • building codes<br>  • OHS and environmental requirements<br>  • plumbing regulations<br>• relevant Australian standards<br>• safe work procedures relating to determining, fabricating, installing and testing non-ferrous |

**RANGE STATEMENT**

pressure pipe systems
- signage
- verbal, written and graphical instructions
- work bulletins
- work schedules, plans and specifications.

# Unit Sector(s)

**Unit sector** Plumbing and services

# Co-requisite units

**Co-requisite units** Nil

# Functional area

**Functional area**