



**Australian Government**

# **CPCPCM3023A Fabricate and install non-ferrous pressure piping**

**Release 1**

# **CPCPCM3023A Fabricate and install non-ferrous pressure piping**

## **Modification History**

Prerequisite unit updated

Changes to application, performance criteria, required skills, range statement and critical aspects

Not equivalent to CPCPCM3013A

## **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**

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

- |   |                                     |     |                                                                                                                                                                                                             |
|---|-------------------------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Prepare for work.                   | 1.1 | Plans and specifications and any special instructions are obtained.                                                                                                                                         |
|   |                                     | 1.2 | <b><i>Work health and safety</i></b> (WHS) and <b><i>environmental requirements</i></b> associated with the fabrication and installation of non-ferrous pressure piping are adhered to throughout the work. |
|   |                                     | 1.3 | <b><i>Quality assurance requirements</i></b> are identified and adhered to according to workplace requirements.                                                                                             |
|   |                                     | 1.4 | Tasks are planned and sequenced in conjunction with others involved in or affected by the work.                                                                                                             |
|   |                                     | 1.5 | <b><i>Tools and equipment</i></b> , including personal protective equipment, are selected and checked for serviceability.                                                                                   |
|   |                                     | 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 plans, specifications and authorities' requirements.                                                                                                              |
|   |                                     | 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.                         |
|   |                                     | 2.3 | Measurements for fabrication or assembly are determined and transferred.                                                                                                                                    |
|   |                                     | 2.4 | Quantity and type of <b><i>materials</i></b> required are calculated from plans and specifications according to regulatory authorities and workplace requirements.                                          |

- 2.5 Materials are identified, ordered and collected according to workplace procedures.
    - 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.
    - 3.2 Fixings and supports are installed to manufacturer requirements, job plans, specifications and standards.
    - 3.3 Pipe system is fabricated and jointed according to plans, standards and manufacturer requirements.
    - 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 and installation requirements.
    - 3.6 ***Sustainability principles and concepts*** are applied throughout the installation process.
- 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 manufacturer 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 join non-ferrous pipe materials by mechanical and manual means, prefabricate components, and fix and test the system for soundness
- technology skills to:
  - access and understand site-specific instructions in a variety of media
  - use mobile communication technology

### Required knowledge

- fabrication, installation and testing process for non-ferrous pressure pipe systems
- job safety analysis (JSA) and safe work method statements (SWMS)
- processes for accessing information and for calculating material requirements
- properties and characteristics of conveyed materials, including pressure, flow rates and

temperature implications

- relevant statutory authorities' requirements and standards related to fabricating, installing and testing non-ferrous pressure pipe systems
- SI system of measurements
- workplace and equipment safety requirements

## Evidence Guide

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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
- given the plans and specifications, fabricating, installing and testing 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 according to 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:
  - application of sustainability principles and concepts
  - 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 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

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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
- protective clothing and equipment prescribed under legislation, regulations and workplace policies and practices
- safe operating procedures, including recognising and preventing hazards associated with:
  - electricity
  - use of fabrication tools and equipment

- dangerous materials
- service lines
- surrounding structure and facilities
- traffic control
- trip hazards
- work site visitors and the public
- working at heights
- working in proximity to others
- use of firefighting equipment
- use of first aid equipment
- workplace environment and safety.

***Environmental requirements***  
include:

- clean-up protection
- waste management.

***Quality assurance requirements***  
may include:

- Australian standards
- Environment Protection Authority (EPA)
- internal company quality assurance policy and risk management strategy
- International Standards Organisation
- National Construction Code
- site safety plan
- workplace operations and procedures.

***Tools and equipment*** may include:

- elevated work platforms
- hand and power tools
- heating equipment
- ladders
- mechanical bending equipment
- silver brazing equipment
- testing equipment
- lifting and load shifting equipment, including:
  - chain blocks
  - forklifts
  - hand trolleys
  - hoists and jacks
  - rollers
  - scaffolding.

**Materials** may include:

- aluminium tubes
- copper
- copper alloy
- polymer pipes
- stainless steel
- other approved materials.

**Sustainability principles and concepts:**

- cover the social, economic and environmental use of resources to meet current and future needs
- may include:
  - appropriate material selection to ensure minimal environmental impact
  - minimising water wastage
  - efficient use of material
  - material selection
  - recycling material.

**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:
  - building codes
  - WHS and environmental requirements
  - plumbing regulations
- relevant Australian standards
- safe work procedures relating to determining, fabricating, installing and testing non-ferrous pressure pipe systems
- 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.