Australian Government

CPCPCM2048A Cut and join sheet metal

Release 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

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Modification History

Prerequisite unit updated
Changes to performance criteria, required skills, range statement and critical aspects
Not equivalent to CPCPCM2028A

Unit Descriptor

This unit of competency specifies the outcomes required to cut and join sheet metal associated with the fabrication, installation and repair functions of the plumbing sector.

Application of the Unit

This unit of competency supports metal fabrication work used in plumbing applications.
Site location for work application may be either domestic or commercial and may be a new work site or an existing structure or fitting 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, drawings and specifications are obtained from supervisor for planned work activity.
		1.2	***Work health and safety*** (WHS) and ***environmental requirements*** associated with cutting and joining sheet metal are adhered to throughout the work.
		1.3	***Quality assurance requirements*** 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	***Tools and equipment***, including personal protective equipment, are selected and checked for serviceability.
		1.6	Work area is prepared to support efficient cutting and joining of sheet metal.
2	Identify joining requirements.	2.1	Selected sheet metal is checked for compliance with plans and specifications.
		2.2	Joining ***materials*** are selected to comply with plans and specifications.
		2.3	Sealants, fixing materials and sheet metal materials are checked for compatibility and are appropriate for the job.

3	Cut and join sheet metal.	3.1	Sheet metal is marked out according to plans and specifications.
		3.2	Sheet metal is cut to pattern using appropriate cutting tool.
		3.3	Laps are measured and shaped for joining using appropriate tools and equipment according to plans and specifications.
		3.4	Surface is prepared and cleaned of grease and other contaminants.
		3.5	Sheet metal is joined to comply with plans and specifications, avoiding damage to surrounding surfaces.
		3.6	***Joins*** are cleaned and visually inspected ensuring materials are correctly aligned, joined and sealed.
		3.7	***Sustainability principles and concepts*** are applied throughout the cutting and joining 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:
  - cut and join sheet metal in the fabrication of plumbing components and select suitable joins and sealants for the application and material
  - identify and report to appropriate personnel any faults in tools, equipment or materials
- literacy skills to:
  - complete workplace documentation
  - read and interpret:
    - documentation from a variety of sources
    - plans and specifications
- 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
- technology skills to:
  - access and understand site-specific instructions in a variety of media
  - use mobile communication technology

Required knowledge

- appropriateness of different fastening methods for different applications
- capillary action, thermal expansion and fabrication techniques to prevent leaking installations
- characteristics of various metal materials and their compatibility with different joining

methods
- electrolysis and problems associated with the use of dissimilar metals
- job safety analysis (JSA) and safe work method statements (SWMS)
- organisational quality procedures and processes within the context of cutting and joining of sheet metal
- SI system of measurement
- workplace and equipment safety requirements, including relevant statutory regulations, codes and standards

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 the ability to:

- locate, interpret and apply relevant information, standards and specifications for cutting and joining sheet metal
- apply safety requirements throughout the work sequence, including electrical safety requirements and the use of personal protective clothing and equipment
- given the plans and specifications:
  - cut and join items of sheet metal demonstrating a range of commonly used joining techniques and the use of approved sealants
  - plan the layout, fabricate and assemble a sheet metal product incorporating at least three joining techniques, ensuring:
    - application of sustainability principles and concepts
    - correct identification of requirements and details of proposed joins and assemblies
    - correct selection and use of appropriate processes, tools and equipment
    - completion of all work to specification
    - compliance with regulations, relevant Australian standards and organisational quality procedures and processes
    - communicating and working effectively and safely with others.

Context of and specific resources

This competency is to be assessed using standard and

for assessment

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, including of electrical hazards
- hazardous materials and substances
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and practices
- use of firefighting equipment
- use of first aid equipment
- use of tools and equipment
- workplace environment and safety.

Environmental requirements may include:

- clean-up protection
- waste management.

Quality assurance requirements may include:

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

Tools and equipment may include:

- guillotines
- hand and power tools
- measuring equipment
- other special joining tools and machines
- soldering equipment
- tin snips.

Materials may include:

- rivets
- self-drilling and tapping fasteners
- sheet metal, including:
  - colour coated
  - copper
  - galvanised
  - zincalume
  - aluminium
  - lead
  - zinc
- silicon and other sealants.

Types of ***joins*** may include:

- grooved seam
- knock up
- lap
- Pittsburgh lock
- resistance (spot) weld
- riveted and screwed
- solder.

Sustainability principles and concepts:	• cover the social, economic and environmental use of resources to meet current and future needs
	• may include:
	  • selecting appropriate components and material
	  • choosing efficient products
	  • using material efficiently.

Unit Sector(s)

Functional area

Unit sector Plumbing and services

Custom Content Section

Not applicable.