



Australian Government

Department of Education, Employment and Workplace Relations

MEM09217A Prepare plans for pipe and duct fabrication

Release: 1

MEM09217A Prepare plans for pipe and duct fabrication

Modification History

Release 1 - New unit of competency

Unit Descriptor

This unit of competency covers the skills and knowledge required to prepare installation plans and drawings for pipe and duct fabrication. It entails identifying and documenting methods most suitable for joining, cutting and supporting pipe and duct used in air conditioning systems.

Application of the Unit

This unit would be applied by draftspersons operating within the air conditioning industry. Application of this unit includes identifying suitable methods of joining and supporting duct and pipes for copper, mild steel, stainless steel and plastic; identifying the correct methods for joining and cutting in plans; and correctly aligning the methods with material types. Work is conducted to meet predetermined project specifications and requires access to and interpretation of organisational and industry catalogues and product specifications. Drawings/models will usually be carried out with the use of computer-aided design (CAD) systems but may also be done manually. Drawings are produced to Australian Standard (AS) 1100.101–1992 Technical drawing – General principles, from predetermined critical dimensions and specifications. If CAD systems are to be used, the unit MEM30031A Operate computer-aided design (CAD) system to produce basic drawing elements, should also be selected.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Pre-Requisites

MEM09002B Interpret technical drawing

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	Access and interpret specifications	1.1	Interpret project specifications and requirements for pipework, including layout, sizing and type of pipe and duct required
		1.2	Determine implications and requirements for pipe fabrication and support
		1.3	Access and interpret organisational and industry standards, information and catalogues to obtain required product specifications
2	Document pipe fabrication	2.1	Select methods of joining and cutting pipe that are appropriate for the materials being used
		2.2	Document pipe fabrication requirements on plans
		2.3	Include instructions for electrolysis of dissimilar materials on plans where required
3	Document support for pipework	3.1	Select methods for supporting pipework that are appropriate for the materials being used
		3.2	Document pipe support requirements on plans
		3.3	Include instructions for electrolysis of dissimilar materials on plans where required
4	Document duct fabrication	4.1	Select methods of joining and cutting duct that are appropriate for the materials being used
		4.2	Document duct fabrication requirements on plans
		4.3	Include instructions for electrolysis of dissimilar

materials on plans where required

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| 5 | Document duct support | 5.1 | Select methods for supporting duct work that are appropriate to the materials being used |
| | | 5.2 | Document duct support requirements on plans |
| | | 5.3 | Include instructions for electrolysis of dissimilar materials on plans where required |
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| 6 | Complete and store drawings | 6.1 | Complete drawings and associated technical information in accordance with project requirements and company procedures |
| | | 6.2 | Process drawings and associated documentation for approval in accordance with organisational requirements |
| | | 6.3 | Store drawings and associated documentation in accordance with organisational procedures |

Required Skills and Knowledge

Required skills

Required skills include:

- literacy skills sufficient to read and interpret instructions, relevant codes of practice and specifications for drawing work
- using computer technologies and navigating software
- numeracy skills sufficient to interpret technical information and conduct mathematical problem solving as required in the scope of this unit
- using and maintaining drawing equipment
- applying spatial principles to achieve scale and proportion
- interpersonal skills to consult with other disciplines
- selecting methods of joining, cutting and supporting pipe appropriate to work requirements
- selecting methods of joining, cutting and supporting duct appropriate to work requirements
- completing sketches and drawings with required information for fabrication
- presenting drawings and documentation according to industry standard

Required knowledge

Required knowledge includes:

- relevant codes of practice
- industry standards
- occupational health and safety (OHS) requirements
- duct construction
- types of duct:
 - supply air (S/A)
 - return air (R/A)
 - toilet exhaust
 - kitchen exhaust
 - smoke spill
 - fire rated
 - textile duct
 - sub-ducts
 - filter plenums
- types of duct insulation (materials and facings):
 - foil face
 - perf face
 - black matt
 - melinex lining
 - galvabond

- polyester
- fibreglass
- jointing
- flanges
- seams
- pipe construction:
 - materials
 - copper
 - steel
 - Acrylonitrile – Butadiene – Styrene (ABS)
 - polyvinyl chloride (PVC)
 - stainless steel
- pipework insulation:
 - fibreglass
 - polystyrene
 - facings
 - nitrile rubber
- methods for supporting:
 - clamping
 - hanging
 - fixings
- sketching pipe and duct fabrication joining methods for pipe and duct work (steel, copper, stainless steel, aluminium and plastic)
- brackets and supports

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	A person who demonstrates competency in this unit must be able to interpret specifications to select appropriate methods of pipe and duct fabrication for a range of materials.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Specifically the candidate must be able to: • work within typical site/teamwork structures and methods • apply worksite communication procedures • comply with organisational policies and procedures, including quality requirements • participate in work meetings • comply with quality requirements • use industry terminology • apply appropriate safety procedures • determine and document appropriate pipe and duct work fabrication and support requirements to meet project specifications and industry standards.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. 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. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with drafting or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Range Statement

Methods of joining	Methods of joining may include: • spigots • flanges • mild steel angles • weld • braze • solder • seal • bolt
Materials	Materials must include: • copper • mild steel • stainless steel • plastic
Methods for supporting	Methods for supporting may include: • clamping • hanging • steel profile types

Unit Sector(s)

Drawing, drafting and design

Custom Content Section

Not applicable.