



Australian Government

Department of Education, Employment and Workplace Relations

MEM09219A Prepare drawings for fabricated sheet metal products

Release: 1

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Modification History

Release 1 - New unit of competency

Unit Descriptor

This unit of competency covers the skills and knowledge required to prepare detail drawings for fabrication of sheet metal products.

Application of the Unit

This unit would be applied by draftspersons operating within the manufacturing and engineering industry. Application of this unit includes documenting product features and fabrication methods. Output may be required in 2-D or 3-D models.

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	Identify design process for fabricated sheet metal products
		1.2	Interpret specifications and requirements for product and determine implications and requirements for fabrication
		1.3	Access and interpret organisational and industry standards, information and catalogues to obtain required product specifications
2	Identify fabrication techniques	2.1	Identify features of sheet metal products and techniques used in fabrication
		2.2	Identify characteristics of metal materials used in fabricated products and implications for fabrication techniques
		2.3	Identify terminology, symbols and standards used in drawings for fabricated products and required inclusions for fabrication drawings
3	Prepare detail drawing	3.1	Perform calculations required to complete drawings to specifications
		3.2	Lay out the drawing in accordance with specifications and industry conventions
		3.3	Ensure drawing accurately reflects specifications, is presented according to organisational requirements and contains all relevant information, including full notation and dimensioning
		3.4	Apply workplace occupational health and safety (OHS) and environmental procedures

4	Document and store drawings	4.1	Document drawings and associated technical information in accordance with project requirements and organisational procedures
		4.2	Store drawings according to 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
- applying drawing techniques and conventions to inform fabrication
- applying symbols, schedules and legends to the drawing
- arranging the views in a logical manner and in accordance with AS 1100.101–1992 Technical drawing – General principles
- correctly using line thickness and construction to identify parts
- using engineering and manufacturer catalogues, tables, standards and specifications
- applying surface texture symbols to comply to engineer's requirements

Required knowledge

Required knowledge includes:

- relevant codes of practice
- industry standards, drawing symbols and conventions
- OHS requirements
- general knowledge of different approaches to drawing
- features and uses of materials and components used in sheet metal fabricated products
- characteristics of sheet metal and implications for drawing
- techniques used to fabricate sheet metal products

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.

<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to interpret specifications and apply in detail drawings for fabricated sheet metal products.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p> <p>Specifically the candidate must be able to:</p> <ul style="list-style-type: none"> • 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 • interpret and apply specifications for fabricated products, and produce detail drawings according to industry standards and conventions.
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>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.</p>

	<p>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.</p>
Method of assessment	<p>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.</p>

Range Statement

Fabrication techniques	<p>Fabrication techniques include:</p> <ul style="list-style-type: none"> • joining techniques: <ul style="list-style-type: none"> • spigots • flanges • mild steel angles • weld • braze • solder • seal • bolt • cutting methods: <ul style="list-style-type: none"> • thermal and mechanical cutting • forming and shaping of plate, sheet and tubular ferrous and non-ferrous metal • folding and unfolding
Materials	<p>Materials may include:</p> <ul style="list-style-type: none"> • mild steel • stainless steel
Drawing details	<p>Drawing details may include:</p> <ul style="list-style-type: none"> • base faces, contour flanges and contour rolls • secondary faces, contour flanges and contour rolls • sheet metal parameters • flanges • hems, folds and bends • corner rounds and chamfers • sheet metal cuts (holes, cuts and punch features) • corner seams (seams and miters) • flat patterns • lofted flanges • rips • unfolding and refolding

Unit Sector(s)

Drawing, drafting and design

Custom Content Section

Not applicable.