



Australian Government

Department of Education, Employment and Workplace Relations

MEM30032A Produce basic engineering drawings

Release: 1

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Modification History

Release 1 - New unit of competency

Unit Descriptor

This unit of competency covers producing drawings or similar graphical representations where the critical dimensions and associated tolerances and design specifications are predetermined.

Application of the Unit

This unit applies to any of the full range of engineering disciplines. All work is carried out under supervision and all specifications, dimensions and tolerances are predetermined. The unit covers application of introductory drafting skills to select and apply drawing protocols. Manual drafting or computer-aided design (CAD) drawing equipment may be used.

If CAD skills are required, MEM30031A Operate computer-aided design (CAD) system to produce basic drawing elements, should be selected.

Drawings are completed to Australian Standard (AS) 1100.101–1992 Technical drawing – General principles.

Licensing/Regulatory Information

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

Pre-Requisites

Not applicable.

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	Identify drawing requirements	1.1	Identify information requirements for work and obtain all relevant job requirements and design specifications in accordance with workplace procedures
		1.2	Identify, interpret and analyse drawing requirements, specifications and relevant workplace information
		1.3	Interpret and apply industry terminology for drawing work
		1.4	Confirm communication practices required during drawing work
		1.5	Estimate time requirements for completing work
2	Select drawing features	2.1	Set up drawing list or register
		2.2	Determine level of detail and numbers of drawings required for work
		2.3	Plan presentation and layout, and determine drawing sheets, text style and size, and scales, appropriate for drawing work
		2.4	Identify features and applications of line types and thicknesses and select for drawing work
		2.5	Establish datums and dimensions
3	Prepare and detail drawings	3.1	Prepare drawings in plane orthogonal, isometric projection or equivalent
		3.2	Detail drawings in third angle projection, including auxiliary views, sections and assemblies

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| | | 3.3 | Draw sections through engineering components incorporating correct use of cutting plane symbols and conventions |
| | | 3.4 | Include appropriate symbols for limits and fits, surface texture and geometric tolerances |
| | | 3.5 | Resolve problems in consultation with a supervisor |
| | | 3.6 | Check drawing compliance with work instructions and specifications |
| 4 | Select physical dimensions and produce engineering parts list | 4.1 | Where required, select components and/or materials from supplier/manufacturer catalogues using predetermined design specifications |
| | | 4.2 | Produce an engineering parts list in accordance with workplace procedures |
| 5 | Complete drawing documentation | 5.1 | Obtain approval for drawings and/or parts list |
| | | 5.2 | Store approved drawings and/or parts lists |
| | | 5.3 | Catalogue and issue drawing and documentation in accordance with workplace procedures |

Required Skills and Knowledge

Required skills

Required skills include:

- correctly using and maintaining equipment, including CAD
- manual drafting, filing and printing
- reading and interpreting specifications
- communicating with supervisor to confirm work requirements and outcomes
- visualising components
- preparing a drawing in plane orthogonal, isometric projection or equivalent
- determining drawing protocols required to complete drawing to industry standard
- selecting and locating text to support presentation
- establishing datums and dimensions for drawings
- drawing sections through an engineering component incorporating correct use of cutting plane symbols and conventions

Required knowledge

Required knowledge includes:

- drafting media, including cartridge paper, tracing paper, drafting film and plain printing paper
- layout conventions
- effective use of blank space, location of notes and symbols
- sectioning
- overview of graphical techniques
- assembly drawings and explosion drawings
- schematics/line drawings, graphs and pictorials
- standard engineering drawing symbols, references and terminology
- application of surface finish symbols to drawings
- uses of different scales in industry applications
- uses and types of line weights
- uses and types of drawing sheets
- type of information provided with drawings

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 produce basic engineering drawings to AS 1100.101–1992 Technical drawing – General principles.</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 • produce drawings in orthogonal and isometric projection to AS 1100.101–1992 Technical drawing – General principles • produce drawings in third angle projection, including auxiliary views, sections and assemblies • include all details, symbols and notation.
<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. The assessment environment should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and</p>

	reporting associated with producing basic engineering graphics, 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

Specifications	Specifications may be obtained from: <ul style="list-style-type: none"> • design information • customer • ideas • concepts/expectations/requirements • sketches • preliminary layouts
Drawings	Drawings may include: <ul style="list-style-type: none"> • plans • diagrams • charts
Consultation	Consultation may include <ul style="list-style-type: none"> • reference to appropriate personnel, including technical supervisors, manufacturers, suppliers, contractors and customers
Engineering parts list	Engineering parts list may include: <ul style="list-style-type: none"> • part name • description of part • material specification or part number • quantities • other details, as required
Issued drawings	Issued drawings may include: <ul style="list-style-type: none"> • hard copy • photographic, slide or transparency form, including presentation as a single drawing and/or with other drawings • support documentation as a package

Unit Sector(s)

Drawing, drafting and design

Custom Content Section

Not applicable.