



Australian Government

Department of Education, Employment and Workplace Relations

MEM30033A Use computer-aided design (CAD) to create and display 3-D models

Release: 1

MEM30033A Use computer-aided design (CAD) to create and display 3-D models

Modification History

Release 1 - New unit of competency

Unit Descriptor

This unit of competency covers using a computer-aided design (CAD) program to produce and plot basic 3-D view drawings.

Application of the Unit

This unit applies to the production of 3-D models using CAD software and associated equipment. This will include the use of region and solid modelling techniques, section views and pre-drawn library files. Work also includes extraction of properties and application of basic rendering techniques.

All work is conducted under supervision.

Licensing/Regulatory Information

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

Pre-Requisites

MEM30031A Operate computer-aided design (CAD) system to produce basic drawing elements

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	Confirm drawing requirements	1.1	Confirm purpose, scope and information and presentation requirements for drawing
		1.2	Identify, interpret and analyse available information relevant to project and work requirements, and identify and address further information needs
		1.3	Identify computing equipment and software used in the organisation
		1.4	Identify work flow and procedures for work supervision and confirm communication requirements through project
		1.5	Examine requirements for presentation of drawings
2	Create and display 3-D views	2.1	Set up a 3-D environment on the screen to allow multiple viewing
		2.2	Create 3-D views on the screen by manipulation of drawing planes and insertion of 3-D geometric shapes
		2.3	Draw on any plane of the 3-D view
		2.4	Use editing functions to modify 3-D geometric shapes in creating 3-D views
		2.5	Produce wire line, surface and solid face displays in isometric, perspective and orthographic projections
3	Detail 3-D model	3.1	Extract the mass and surface area of a given solid model made from a nominated material
		3.2	Apply basic rendering techniques to render solid model

to a specified set of criteria

4	Save completed drawing file in various formats	4.1	Save file in an appropriate format to enable retrieval and use in a CAD system
		4.2	Save file in other formats to enable retrieval in other software applications

Required Skills and Knowledge

Required skills

Required skills include:

- reading and interpreting engineering specifications
- organising information
- using computer and peripherals
- using CAD program
- saving 3-D modes in various file formats
- preparing drawings in plane orthogonal, isometric projection or equivalent

Required knowledge

Required knowledge includes:

- region modelling techniques
- solid modelling techniques
- development of sectioned models
- use of cutting plane
- use of cross hatching
- use of pre-drawn library files and primitives to produce a 3-D model
- use of third level software to produce 3-D models
- how to extract mass and area properties
- how to extract area properties from region models
- application of basic rendering techniques to a 3-D model

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 use CAD to create and display 3-D models.
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 • identify modelling work requirements and determine appropriate software functions and features • apply CAD functions to produce a rendered 3-D model to Australian Standard (AS) 1100.101–1992 Technical drawing – General principles.
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. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with using CAD to create and

	display 3-D models 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

Multiple viewing	Multiple viewing includes: • top views • front and side views • general 3-D view
3-D geometric shapes	3-D geometric shapes may include: • arcs and lines • spheres • cones • cylinders • boxes

Unit Sector(s)

Drawing, drafting and design

Custom Content Section

Not applicable.