Australian Government

MEM09214 Perform advanced engineering detail drafting

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MEM09214A Perform advanced engineering detail drafting.

Application

This unit of competency defines the skills and knowledge required to perform advanced engineering detail drafting to Australian Standard (AS) 1100.101 Technical drawing - General principles or equivalent and has been developed for an engineering detail draftsperson. It can be applied individually or in a team environment where comprehensive responsibility for the production of the drawing is exercised.

Critical dimensions and associated tolerances are determined where required and drawings can be created with or without the use of computer-aided design (CAD) systems.

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

Pre-requisite Unit

MEM09204 Produce basic engineering detail drawings

MEM09229 Read and interpret technical engineering drawings

MEM30012 Apply mathematical techniques in a manufacturing engineering or related environment

Competency Field

Drawing, drafting and design

Elements and Performance Criteria

Elements	**Performance Criteria**
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Prepare for drawing work	1.1 Follow standard operating procedures (SOPs) and comply with work health and safety (WHS) requirements at all times 1.2 Determine purpose, scope and presentation requirements for drawing task 1.3 Determine the information requirements for the finished part or item and its interaction with the next level of assembly or process

Elements	**Performance Criteria**
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
	1.4 Submit requests for further information (RFI) to designer where information cannot be obtained or calculated 1.5 Identify relevant standards and terminology, symbols and notation required to comply with standard and design 1.6 Prepare equipment and set up software for drawing work
2. Identify and apply dimensions and tolerances for drawing	2.1 Determine methods of general dimensioning and tolerancing, classes of fit and forms of geometric shapes, from engineer, sketches or specifications 2.2 Select dimensioning and tolerancing scheme and symbols consistent with standards and design requirements 2.3 Identify and confirm datum points 2.4 Apply the principles of general dimensioning to engineering drawing 2.5 Apply the principles of general tolerancing to engineering drawing 2.6 Check that each dimension and tolerance symbol can be clearly interpreted for application 2.7 Re-dimension tolerance drawing with new datum positions if required 2.8 Extract information from dimensioned drawing
3. Prepare assembly, layout and detail drawings	3.1 Produce sectioned third angle orthogonal assembly drawings 3.2 Project a primary auxiliary view 3.3 Produce finished assembly drawings complete with required material, part and cutting lists, cross-referencing and any required dimensions, both overall and centre-to-centre 3.4 Produce all drawings to AS 1100.101 Technical drawing - General principles or equivalent, and organisational presentation standards 3.5 Check that all required tolerances and dimensions are on the drawing
4. Select material, components and assemblies	4.1 Interpret specifications to determine material requirements 4.2 Select components, material and assemblies from data sheets or manufacturer catalogues to meet specifications 4.3 Produce bill of materials to specifications
5. Complete drawing	5.1 Verify drawing compliance with specifications

Elements	Performance Criteria
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
work	5.2 Check drawings to ensure that assembly or fabrication is possible 5.3 Document and save drawings in accordance with SOPs

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.	
Dimensioning includes one or more of the following:	• symbols • lines • numerical value • linear • angular • diameter • radius • not to scale (NTS) • auxiliary • reference • common feature • tabular presentation • squares • holes • screw heads • tapers/slope • profiles • notes.
Tolerancing includes one or more of the following:	• basic dimension • bilateral • unilateral

	• zone • datum • tolerance grade • datum feature.
Symbols used for tolerancing include one or more of the following:	• datum identification • form • location • profile • runout • modifiers.
Symbols used for dimensioning include one or more of the following:	• diameter • square • counterbore • countersink • depth • dimension origin • reference value • slope • taper • radius • spherical radius.
Condition includes one or more of the following:	• fit • limits of size • fundamental deviation • allowance • maximum material condition • least material condition.
Geometry tolerancing includes one or more of the following:	• virtual condition and size • geometric reference frame • principle of independency • tolerance (form, profile, orientation and position) • characteristics, including: • straightness • flatness • circularity • cylindricity • profile • squareness • parallelism • angularity • runout

	• tolerance indication method • projected tolerances • statistical value tolerances.
Assembly drawing types includes one or more of the following:	• general assembly • detailed assembly • layout drawings • installation drawings • erection diagrams • shop and field assemblies • pictorial exploded drawings.
Information from dimensioned drawing includes one or more of the following:	• limits of size • fundamental deviation • allowance • tolerance, including: • maximum material condition • least material condition • fit.
Drawings include one or more of the following:	• accurate representation, including any necessary hidden detail of the specific assembly • border, title block and projection symbols • accurate line work • appropriately positioned views • hatching to AS 1100.101 Technical drawing - General principles specifications (sectioned third angle orthogonal assembly drawings) • correct use of terminology and abbreviations.
Auxiliary projection includes one or more of the following:	• purpose for auxiliary projection • planes of projection • projection involving circular components • border, title block and projection symbols.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM09214A Perform advanced engineering detail drafting.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2