Australian Government

Department of Education, Employment and Workplace Relations

MEM05039B Perform advanced geometric development - conical

Release: 1

MEM05039B Perform advanced geometric development - conical

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers marking out complex conical fabrications using advanced geometric development techniques.

Application of the Unit

Application of the unit	This unit reflects the advanced skills required to calculate cutting, bending lines and developments. Applications may include hoppers with round/rectangular branch intersections. In the context of light gauge fabrications this unit may apply to marking out complex cylindrical&rectangular sheetmetal fabrications used in square/rectangular ventilation ducting, air-conditioning&cylindrical components. In the context of heavy gauge fabrications this unit may apply to marking out complex cylindrical&rectangular plate and/or pipe fabrications used in ducting, extraction, piping and cylindrical components. Marking out skills for general engineering and maintenance are covered by Unit MEM12006C (Mark off/out (general engineering)), MEM07005C (Perform general machining), Unit MEM18006C (Repair and fit engineering components) and Unit MEM18014B (Tool, gauge and die manufacture) **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05037C	Perform geometric development
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM12024A	Perform computations
	MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment

Employability Skills Information

Employability skills	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

ELEMENT	PERFORMANCE CRITERIA
1. Mark off/out fabrications	1.1. Specifications and work requirements are determined using correct calculations appropriate to the task. 1.2. Development is carried out to specifications or standard operating procedures using tools and equipment appropriate to the task. 1.3. Datum points are correctly established and indicated. 1.4. Allowances are correctly determined and marked (thickness, bend, pitch, angle, circumference, perimeter).
2. Make templates as required	2.1. Template material is selected appropriate to the marking out requirements. 2.2. Templates are accurately produced. 2.3. Allowances are correctly determined and transferred. 2.4. Templates for rolling, bending, pressing, drilling and profiling are accurately produced. 2.5. Correct storage procedures are followed including labelling and identification to standard operating procedures.
3. Develop patterns as required	3.1. The most appropriate development method for the task is chosen and applied. 3.2. Allowances are correctly determined and transferred.
4. Interpret relevant codes, standards and symbols	4.1. Relevant standards/codes and symbols are interpreted. 4.2. Requirements of standards/codes are interpreted and applied to materials and processes.
5. Estimate quantities of materials from engineering drawings	5.1. Materials are correctly identified. 5.2. Quantities are estimated from drawing. 5.3. Material use is optimised and wastage is minimised.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- performing material calculations
- carrying out geometric development
- establishing datum points
- calculating allowances
- marking out techniques
- producing template/patterns
- labelling and storing template/patterns
- developing template/patterns
- determining and transferring fabrication and assembly allowances
- applying relevant codes/standards
- calculating material and component quantities by applying geometric formulae
- applying principles for minimising material wastage

Required knowledge

Look for evidence that confirms knowledge of:

- tools, equipment, techniques in template/ pattern development
- datum points
- geometrical principles, and formulae
- template/patterns materials
- procedures for making template/patterns
- template/patterns labelling, identification, storage and development
- calculations of allowances:
  - thickness
  - bend
  - pitch
  - angle
  - circumference
  - perimeter
- manufacturers' allowances on materials
- fabrication and assembly allowances
- effects of material type/thickness on fabrication and assembly allowances
- sources of data on fabrication/ assembly allowances
- relevant standards, codes, symbols
- fabrication materials
- optimising material use and minimising material wastage
- safe work practices and procedures

Evidence Guide

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 mark out complex conical fabrications. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
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.
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 marking out complex conical fabrications 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.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Fabrications	Hoppers with round/rectangular branch intersections
Allowances	Thickness, bend, pitch, angle, circumference, perimeter
Template material	Steel plate, perspex, timber
Templates produced	Rolling, bending, pressing, drilling and profiling, cutting
Storage procedures	Labelling, identification, e.g. template lofts
Development methods	Parallel line, radial line and triangulation

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units	

Co-requisite units		

Competency field

Competency field	Fabrication