



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **MEM05040B Perform advanced geometric development - transitions**

**Release: 1**

## **MEM05040B Perform advanced geometric development - transitions**

### **Modification History**

Not Applicable

## Unit Descriptor

<b>Unit descriptor</b>	This unit covers marking out complex fabrications using geometric development.
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## Application of the Unit

<b>Application of the unit</b>	<p>This unit reflects the advanced skills required to calculate cutting, bending lines and developments. Fabrications may include elliptical shapes, curves, spirals etc. Patterns may include complex and irregular shapes.</p> <p>In the context of light gauge fabrications this unit may apply to marking out complex cylindrical&amp;rectangular sheetmetal fabrications used in square/rectangular ventilation ducting, air-conditioning&amp;cylindrical components.</p> <p>In the context of heavy gauge fabrications this unit may apply to marking out complex cylindrical&amp;rectangular plate and/or pipe fabrications used in ducting, extraction, piping and cylindrical components.</p> <p>Marking out skills for general engineering and maintenance are covered by Units MEM12006C (Mark off/out [general engineering]), MEM07005C (Perform general machining), MEM18006C (Repair and fit engineering components) and MEM18014B (Manufacture tools, gauges and dies).</p> <p><b>Band: A</b></p> <p><b>Unit Weight: 4</b></p>
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## 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.
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## 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.
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## 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, contraction, etc.).
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 drawings. 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
- determining material and component quantities by applying geometric formulae
- applying principles for optimising material use and minimising material wastage

### Required knowledge

Look for evidence that confirms knowledge of:

- tools, equipment, techniques in template/patterns development
- datum points
- geometrical principles and formulae
- calculations of allowances:
  - thickness
  - bend
  - pitch
  - angle
  - circumference
  - perimeter
- template/patterns materials
- template/patterns development
- manufacturers' allowances on materials
- procedures for making template/patterns
- template/patterns labelling, identification and storage
- 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 fabrications using geometric development of transitions. 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 advanced geometric development of transitions 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.

<b>Fabrications</b>	May include elliptical shapes, curves, spirals etc.
<b>Allowances</b>	Thickness, bend, pitch, angle, circumference, perimeter
<b>Template material</b>	Steel plate, perspex, timber
<b>Templates produced</b>	Rolling, bending, pressing, drilling and profiling, cutting
<b>Storage procedures</b>	Labelling, identification, e.g. template lofts
<b>Development methods</b>	Parallel line, radial line and triangulation

**Unit Sector(s)****Unit sector****Co-requisite units****Co-requisite units**

<b>Co-requisite units</b>		

## Competency field

<b>Competency field</b>	Fabrication
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