



Australian Government

Department of Education, Employment and Workplace Relations

MEM07011B Perform complex milling operations

Release: 1

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Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing complex milling operations, including gear cutting and helical milling of a range of materials.
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Application of the Unit

Application of the unit	<p>This unit applies to a range of complex milling operations including those jobs requiring high precision or quality across a range of materials including non-standard metals and alloys. It also includes those operations requiring complex calculations.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM07007C	Perform milling operations
	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical

Prerequisite units		
		measurement
	MEM12023A	Perform engineering measurements
	MEM12024A	Perform computations
	MEM18001C	Use hand tools

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. Select milling cutters	<p>1.1. Correct milling cutter/s are selected for required operation.</p> <p>1.2. Correct cutter inserts are selected as required using International Standard Organisation standards and mounted in cutter blank.</p> <p>1.3. Cutter is mounted to machine spindle and checked for concentricity.</p>
2. Set up work	<p>2.1. Cutting parameters and steps required to mill given component/s are identified.</p> <p>2.2. Machine is set up with appropriate accessories as required for milling operation.</p> <p>2.3. Work is set up to required level of accuracy.</p>
3. Perform complex milling	<p>3.1. Components are milled and associated calculations are performed as necessary to achieve specification.</p> <p>3.2. Components are verified using appropriate precision measuring equipment and reworked as necessary to meet specification.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying work related information
- setting up work to the required level of accuracy
- determining cutting parameters
- selecting the correct milling cutter inserts for the cutting parameters in accordance with ISO standards
- calculating cutting parameters such as speeds, feeds and ratios
- setting up gear trains according to calculations and standard operating procedures

REQUIRED SKILLS AND KNOWLEDGE

- safely operating milling machine
- performing complex milling operations using dividing heads and omniversal tables

Required knowledge

Look for evidence that confirms knowledge of:

- precision measuring equipment and their applications
- procedures for accurately setting up work
- ISO standards applicable to milling cutter inserts
- procedures for milling components such as racks and gears
- calculations, geometry and formulae relating complex milling activities
- accessories used for complex milling
- the applications and use of omniversal tables and differential dividing heads to complex milling operations
- hazards and control measures associated with complex milling operations, including housekeeping
- 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 perform complex milling operations. 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 performing complex milling operations 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.

Complex milling operations	Cutting of spur gears, racks, helical gears, radial uniform rise cam lobes etc.
Milling cutter/cutters	Ganged cutters, form cutters etc.
Set up	Set up is verified using instruments such as dial test indicators and sine bars etc.
Appropriate accessories	Omniversal tables, differential dividing heads etc.

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

Co-requisite units	

Competency field

Competency field	Machine and process operations
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