



Australian Government

Department of Education, Employment and Workplace Relations

MEM07008D Perform grinding operations

Release: 1

MEM07008D Perform grinding operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers determining the job requirements, observing safety precautions, selecting appropriate wheels and accessories, performing the grinding operations and checking the components for conformance to specifications.
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Application of the Unit

Application of the unit	<p>This unit of competency applies to grinding operations performed on surface, cylindrical and centreless grinding machines. It requires use of measuring equipment and standard engineering materials and tooling.</p> <p>Work is performed to established processes, practices and to drawings, sketches, specifications and instructions as appropriate.</p> <p>This unit has been developed for Engineering Tradesperson - Mechanical apprenticeship training and the recognition of trade level skills in grinding operations. Skills covered by this unit are generally applied in occupational and work situations associated with trade level fitting and machining work.</p> <p>This unit has application in the MEM30205 Certificate III in Engineering - Mechanical qualification and other qualifications requiring a trade level of grinding machine operation skills. Grinding operations and the processes and associated level of skill covered by this unit are often described in industry by the term '1st Class Machining'.</p> <p>Where precision mechanical measurement is required, MEM12003B Perform precision mechanical measurement should also be considered.</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
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	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. Determine job requirements	1.1. Job requirements are determined from specifications, and sequence of operations is determined 1.2. Correct and appropriate holding devices are selected and applied
2. Observe safety precautions	2.1. Machine guards, coolant and dust extraction devices are checked 2.2. Correct safety procedures are observed and protective clothing and safety glasses are worn
3. Select grinding wheels and accessories	3.1. Wheels are selected, balanced and dressed based on knowledge of grinding wheel structure and application 3.2. Accessories are selected to facilitate production to job specifications
4. Perform grinding operations	4.1. Grinding machine is set up and adjusted in accordance with defined procedures 4.2. Work piece is held or clamped appropriately to avoid damage 4.3. Grinding operations are performed safely, utilising all guards, safety procedures and personal protective clothing and equipment
5. Check components for conformance with specifications	5.1. Components are checked for conformance to specification using appropriate techniques, tools and equipment

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- reading and interpreting information on written job instructions, procedures, specifications, charts, lists, drawings and other applicable reference documents
- checking and clarifying task related information
- preparing an operational work plan
- planning and sequencing operations

REQUIRED SKILLS AND KNOWLEDGE

- using precision measurement equipment within the scope of this unit
- setting up work using tools, techniques and equipment
- using coolant and dust extraction devices
- selecting and preparing grinding wheels and accessories appropriate to the grinding task
- performing and monitoring internal/external cylindrical grinding process
- clamping/mounting work pieces
- checking for conformance to specifications
- performing numerical operations and calculations within the scope of this unit

Required knowledge

Required knowledge includes:

- reasons for selecting the chosen sequence of operations
- the application of a range of holding devices/accessories
- reasons for selecting specific work holding devices, tools, techniques and equipment
- coolant selection/function
- standard grinding wheel shapes
- the range of abrasive materials used in grinding wheels
- factors impacting grinding wheel selection including grain size of abrasive particles, grade or strength of bond and bond material
- grinding wheel dressing tools and their application
- internal/external cylindrical grinding process
- principles of effective clamping
- grinding operations/procedures
- the function of any grinding accessories
- tools, techniques and equipment for checking components for conformance to specifications
- hazards and control measures associated with grinding operations, including housekeeping
- use and application of personal protective equipment
- 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 a variety of grinding operations to specifications. 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 apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include:

- determining requirements for grinding job including quantity, material, measurements and tolerances
- correct job planning including identifying required measuring instruments and equipment, safety equipment, holding devices, grinding wheels, accessories and sequence of operations
- identifying guard, coolant and dust extraction requirements and checking equipment and coolant before grinding operation
- correct fixing of job
- correct monitoring of grinding operation
- undertaking grinding to trade standard in terms of time and responsibility for own work
- undertaking correct remedial procedures for out of specification results as per enterprise procedures e.g. procedures for scrapping or reworking of components not ground to specification.

Context of and specific resources for assessment

This unit has been developed to support training in and recognition of trade level competency in grinding operations as applied to a trade level fitting and machining work environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace.

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.

EVIDENCE GUIDE	
Method of assessment	<p>Typically, persons engaged in Engineering Tradesperson - Mechanical work are required to apply their grinding operations skills and techniques across a range of jobs and specifications.</p> <p>A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit.</p> <p>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.</p> <p>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.</p>
Guidance information for assessment	<p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with grinding operations or other units requiring the exercise of the skills and knowledge covered by this unit.</p> <p>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.</p>

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different

RANGE STATEMENT	
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.	
Specifications	Specifications may include: <ul style="list-style-type: none"> • dimensions and tolerances • geometry and tolerances • surface finish
Holding devices	Holding devices may include: <ul style="list-style-type: none"> • vices • clamps • magnetic chucks • face plates • collets • 3/4 jaw chuck
Wheels	Wheels may include: <ul style="list-style-type: none"> • shape • grit/bond composition
Balanced	Balanced may include static and dynamic balancing
Grinding machines	Grinding machines may include surface, cylindrical and centreless machines

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Co-requisite units		

Competency field

Competency field	Machine and process operations
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