



**Australian Government**

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

# **MEM07010B Perform tool and cutter grinding operations**

**Release: 1**

## MEM07010B Perform tool and cutter grinding operations

### Modification History

Not Applicable

### Unit Descriptor

|                        |                                                                             |
|------------------------|-----------------------------------------------------------------------------|
| <b>Unit descriptor</b> | This unit covers performing a range of tool and cutter grinding operations. |
|------------------------|-----------------------------------------------------------------------------|

### Application of the Unit

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Application of the unit</b> | <p>This unit applies to the use of a range of precision measuring instruments and standard engineering materials in performing tool and cutter grinding operations. Work is performed to drawings or sketches, specifications and instructions as appropriate. Work is carried out autonomously to predetermined standards of quality and safety.</p> <p>General off hand grinding is covered by Unit MEM18002B (Use power tools/hand held operations).</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

|                           |           |                             |
|---------------------------|-----------|-----------------------------|
| <b>Prerequisite units</b> |           |                             |
| <b>Path 1</b>             | MEM07005C | Perform general machining   |
|                           | MEM07008D | Perform grinding operations |

| Prerequisite units |           |                                          |
|--------------------|-----------|------------------------------------------|
|                    | MEM09002B | Interpret technical drawing              |
|                    | MEM12003B | Perform precision mechanical measurement |
|                    | MEM12023A | Perform engineering measurements         |
|                    | MEM18001C | Use hand tools                           |

## 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. Observe safety precautions                                         | 1.1. Machine guards, coolant and dust extraction devices are checked.<br>1.2. Correct safety procedures are observed, and protective clothing and safety glasses are worn.                                                                                                                                                                                                                                                           |
| 2. Determine job requirements                                         | 2.1. Drawings are interpreted and sequence of operations is determined.                                                                                                                                                                                                                                                                                                                                                              |
| 3. Select appropriate tool and cutter grinding wheels and accessories | 3.1. Tool and cutter grinding wheels are selected, based on knowledge of grinding wheel structure, and are balanced and dressed. Accessories are selected to facilitate production to specification.                                                                                                                                                                                                                                 |
| 4. Perform tool and cutter grinding                                   | 4.1. Universal tool and cutter grinding machines are operated to sharpen and shape the full range of tools and cutters including side and face cutters, end mill, form relieved milling cutters, flat, vee and circular form tools and hobs, slitting saws, and drills.<br>4.2. Parallel internal and/or external grinding is carried out.<br>4.3. Internal and/or external taper grinding is carried out to drawing specifications. |
| 5. Check components for conformance to specification                  | 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

Look for evidence that confirms skills in:

- reading, interpreting and following information on written job instructions, specifications, charts, lists, drawings and other applicable reference documents
- checking and clarifying task related information
- preparing operational work plan
- planning and sequencing operations
- performing numerical operations and calculations within the scope of this unit

**REQUIRED SKILLS AND KNOWLEDGE**

- performing safety checks of equipment
- selecting tool and cutter grinding accessories
- balancing/dressing grinding wheels
- sharpening/shaping tools and cutters
- checking components for conformance with specifications
- using precision measurement equipment within the scope of this unit

**Required knowledge**

Look for evidence that confirms knowledge of:

- reasons for selecting the chosen sequence of operations
- function of coolant and dust extraction devices
- criteria for grinding wheel selection:
  - grain size of abrasive particles
  - grade or strength of bond
  - bond material
- grinding wheel dressing procedures and wheel dressing tools
- source(s) of data on tool geometry for the full range of tools and cutters, including the terminology used to describe the tool geometry
- procedures to be followed when parallel grinding on a tool and cutter grinder
- procedures to be followed when grinding tapers on a tool and cutter grinder
- tools, techniques and equipment used to check ground components for conformance with the following specifications:
  - dimensions and tolerances
  - geometry and tolerances
  - surface finish
- hazards and control measures associated with tool and cutter grinding, 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 tool and cutter grinding 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 tool and cutter grinding 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.

**Tool and cutter grinding wheels**

Wheel selection criteria includes shape and grit/bond composition

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

## Competency field

|                  |                                |
|------------------|--------------------------------|
| Competency field | Machine and process operations |
|------------------|--------------------------------|