



Australian Government

MEM07041 Perform production machining

Release: 1

MEM07041 Perform production machining

Modification History

Release 1. Supersedes and is equivalent to MEM07041A Perform production machining

Application

This unit of competency defines the skills and knowledge required to perform production machining using engineering machinery.

Production machining refers to use of workshop machines for volume production of parts or components made of metal or other machinable materials where the machine operator has responsibility for the setting up of the machine, including tooling, grinding wheels, and other accessories within defined parameters. It does not include one-off jobbing on workshop machines or complex calculations. Tolerances and tool paths will normally have been set in advance.

Where trade machining applications are undertaken unit MEM07005 Perform general machining should be selected.

Where set up and operation of electro-discharge machines (EDM) is required unit MEM07014 Perform electro-discharge machining (EDM) operations should also be selected.

Where machining is undertaken without the need for any set up, including mounting of tools, setting of speeds, feeds and other operational parameters then unit MEM07024 Operate and monitor machine and process and unit MEM07025 Perform advanced machine and process operation, should also be selected as appropriate.

Where the selection and use of power tools/hand held operations is required unit MEM18002 Use power tools/hand held operations should also be selected.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Band: A

Unit Weight: 8

Pre-requisite Unit

MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12023	Perform engineering measurements
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information

MEM18001

Use hand tools

Competency Field

Machine and process operations

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1	Determine job requirements	1.1	Follow standard operating procedures (SOPs)
		1.2	Comply with work health and safety (WHS) requirements at all times
		1.3	Use appropriate personal protective equipment (PPE) in accordance with SOPs
		1.4	Identify job requirements from specifications, drawings, job sheets or work instructions
2	Follow required sequence of operations	2.1	Confirm number of items to be produced
		2.2	Plan the operation for required run rate, efficiency and minimisation of waste
		2.3	Select correct material for operation from pre-determined stock range
		2.4	Establish starting point on stock for operation
		2.5	Maintain process and quality logs
3	Select and mount tools	3.1	Select appropriate tooling from pre-selected range
		3.2	Select appropriate stock and grind to required tool shape using pre-set jigs and fixtures to achieve pre-determined angles and clearances
		3.3	Monitor tooling and sharpen tools and drills to pre-determined specifications, as required

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|---|--|---|
| 4 | Perform production machining operations | 4.1 Use basic marking out techniques to pre-determined specifications on stock or components |
| | | 4.2 Set machining parameters for job requirements |
| | | 4.3 Monitor tool or cutter performance life |
| | | 4.4 Clamp or hold work without damage to product and ensuring all safety requirements are met |
| | | 4.5 Perform machining utilising all guards and safety procedures |
| | | |
| 5 | Perform production grinding operations | 5.1 Select appropriate grinding wheel for required operation from pre-selected options |
| | | 5.2 Mount and tighten grinding wheels to required sequence and specification |
| | | 5.3 Dress and true grinding wheel using given range of dressing tools |
| | | 5.4 Check grinding wheel for balance and safety |
| | | 5.5 Adjust coolant flow and position |
| | | 5.6 Undertake grinding operation utilising all guards and safety procedures |
| | | 5.7 Monitor grinding wheel performance and life according to SOP |
| | | |
| 6 | Measure components | 6.1 Select instruments or gauges appropriate to the measurement requirements |
| | | 6.2 Check machined or ground items for compliance with specifications |
| | | 6.3 Identify out-of-specification items and check if settings or tooling require adjustment |

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|---|------------------------------------|-----|--|
| 7 | Adjust and maintain machine | 7.1 | Carry out routine maintenance and adjustments, as required |
| | | 7.2 | Report and log malfunctions according to enterprise procedures |

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, accessibility of the item, and local industry and regional contexts) are included.

Operations include one (1) or more of the following:

- parallel cutting
- slotting
- drilling
- knurling
- cutting flats
- centred and centreless grinding operations

Materials include one (1) or more of the following:

- ferrous
- non-ferrous metals
- other machinable materials

Tooling includes one (1) or more of the following:

- carbide
- ceramic and high speed steel machine tooling
- cutting tool accessories
- holding devices

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, accessibility of the item, and local industry and regional contexts) are included.

Measuring devices include one (1) or more of the following:

- rulers
- gauges
- verniers and micrometres (digital or analogue)

Basic marking out techniques include using one (1) or more of the following:

- calipers
- steel rules
- dividers and scribes

Machining parameters include one (1) or more of the following:

- speeds
- feeds
- stops
- coolant and cutting lubricants

Machines include one (1) or more of the following:

- lathes
- mills
- planers
- shapers
- radial and pedestal drills
- slotters
- grinders

Maintenance and adjustments include one (1) or more of the following:

- slide and collar adjustment
- cleaning and lubrication

Types and features of industrial grinding wheels include one (1) or more of the following:

- wheel make-up
- wheel hubs
- wheel classification
- types of grits and bonds

Dressing tools include one (1) or more of the following:

- industrial diamond
- dressing wheels
- dressing sticks

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, accessibility of the item, and local industry and regional contexts) are included.

Balancing of grinding wheels includes the following:

- checks and identification for balance only

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM07041 Perform production machining

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications, drawings and other applicable reference documents to perform production machining
- selecting appropriate tooling, measuring equipment, material and accessories and determining sequencing of operations
- sharpening and shaping cutting tools and drills
- selecting and mounting required tooling or grinding wheels
- setting machining parameters, including using appropriate coolant and lubricants
- checking machined components for conformance to specifications and identifying adjustments to be made to settings/tooling.
- rectifying non-compliant product
- carrying out routine maintenance and adjustments, as required
- reporting/logging malfunctions according to SOPs

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- reasons for selecting the chosen sequence of operations
- methods of work holding
- basic marking out techniques, including datum points/lines
- benefits of using correctly sharpened cutting tools
- machine operation
- selection of feeds and speeds to SOPs
- correct methods of mounting selected cutting tools to sops
- safety issues with regard to correct clamping, guards and shields
- tolerances and limits of size
- situations indicating the need for machine adjustment, lubrication and cleaning
- techniques, tools and equipment to measure materials and machined components

- types and features of industrial grinding wheels, including:
 - international grinding wheel identification system
 - grinding wheel make-up, including bonds and grits
 - purpose and procedure for grinding wheel trueing
 - indicators of a need for grinding wheel dressing, including:
 - wheel glazing
 - wheel loading
 - wheel dresses
 - wheel drilling
- difference between centred and centreless grinding
- indicators of need for dressing, including:
 - loading
 - dulling
 - glazing
 - burn/thermal damage
 - surface finish
- grinding wheel storage and handling
- wheel safety checking, including checks for:
 - cracks
 - defects, including holes, moisture and deterioration
- grinding wheel blotters
- typical range of industrial drills and classification
- drilling machines
- drill sharpening procedures
- drill clamping arrangements
- common reasons for machining failure, including:
 - incorrect speed
 - faulty positioning of work
 - incorrect feed
 - rotation
 - incorrect coolant selection and positioning
- tools, techniques and equipment for checking components for conformance to specifications and rectifying non-compliant components.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing production machining at least to the level being assessed with relevant industry knowledge and experience

- satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* or its replacement and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

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