



Australian Government

MEM07021 Perform complex lathe operations

Release: 2

MEM07021 Perform complex lathe operations

Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM07021 Perform complex lathe operations (Release 1).

Release 1. Supersedes and is equivalent to MEM07021B Perform complex lathe operations.

Application

This unit of competency defines the skills and knowledge required to perform complex turning operations on a range of materials, including non-standard metals and alloys.

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: 4

Pre-requisite Unit

MEM07005	Perform general machining
MEM07006	Perform lathe operations
MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12003	Perform precision mechanical measurement
MEM12023	Perform engineering measurements
MEM12024	Perform computations
MEM13015	Work safely and effectively in manufacturing and engineering
MEM14006	Plan work activities
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 | Set up work on lathe | 2.1 | Determine sequence of operations, including job set-up, for maximum efficiency to meet job specifications |
| | | 2.2 | Set up work on the lathe to required level of accuracy using precision instruments, including dial test indicators |
| | | 2.3 | Balance work piece when using face plates to ensure accuracy in machining, as required |
| | | 2.4 | Set up work piece to ensure that work piece is free of distortion following completion of machining |
| | | | |
| 3 | Select and prepare tooling | 3.1 | Select tooling, accessories and consumables appropriate to task, specifications and material |
| | | 3.2 | Determine cutting tool modifications required to perform complex turning operations, where appropriate |
| | | 3.3 | Prepare tooling and accessories and modify, as required |
| | | 3.4 | Apply International Standard Organisation (ISO) standards for cutting tools or other appropriate standards to suit cutting parameters |

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
4 Perform complex turning	4.1 Calculate speeds and feeds using appropriate mathematical techniques and reference material
	4.2 Undertake complex turning to specifications and workplace procedures
	4.3 Measure work piece and verify in accordance with specifications using precision measuring equipment

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.

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

- cutting tools
- form tools
- boring bars
- drills
- reamers
- thread chasers
- tapping heads
- taps

Complex turning includes one (1) or more of the following:

- single-start and multi-start thread cutting
- internal blind hole thread cutting
- eccentrics
- copy and taper turning
- counterbalancing work on face plates
- mandrel work
- trepanning
- heavy (multi-tonne) shafts

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.

Unit Mapping Information

Release 2. Supersedes and is equivalent to MEM07021 Perform complex lathe operations (Release 1).

Release 1. Supersedes and is equivalent to MEM07021B Perform complex lathe operations.

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 MEM07021 Perform complex lathe operations

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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, charts, lists, drawings and other applicable reference documents in performing complex lathe operations
- setting and supporting work to avoid distortion on release of clamping devices
- selecting and setting up cutting tooling or inserts as appropriate to turning operation
- calculating cutting parameters, speeds and feeds to meet job requirements
- modifying tooling and accessories, as required
- performing complex turning operations according to specifications
- checking machined components for conformance to specifications.

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)
- precision measuring equipment and measuring techniques used in complex turning operations and reasons for selecting different measuring equipment
- procedures for accurately setting up work for a variety of techniques
- International Standards Organisation (ISO) or other standards applicable to cutting tool inserts
- cutting parameters for the given task
- feeds and speeds for complex turning operations
- formulae and data relating to feeds and speeds
- techniques and procedures for carrying out the following turning operations:
 - single-start thread cutting
 - multi-start thread cutting
 - internal blind hole thread cutting

- eccentrics
- copy turning
- taper turning
- counter balancing work on face plates
- mandrel work
- trepanning
- heavy (multi-tonne) shafts.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing complex lathe operations 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.
- Assessment must occur in a functioning workplace. Where assessment in the workplace would be unsafe, impractical or threatens the environment, assessment must occur in a sufficiently rigorous simulated environment that reflects the circumstances that would be experienced in a functioning workplace. Assessment must cover all aspects of workplace performance, including 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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