



Australian Government

MEM12020 Set and operate coordinate measuring machines

Release: 1

MEM12020 Set and operate coordinate measuring machines

Modification History

Release 1. Supersedes and is equivalent to MEM12020B Set and operate coordinate measuring machines

Application

This unit of competency defines the skills and knowledge required to set and operate a range of coordinate measuring machines (CMM).

Appropriate levels of measurement, computer operations and drawing skills should be selected with this unit.

Where interpretation of technical drawings is required unit MEM09002 Interpret technical drawing should also be selected.

Where a selection and use of tools is required unit MEM18001 Use hand tools should also be selected.

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

Band: A

Unit Weight: 2

Pre-requisite Unit

MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information

Competency Field

Measurement

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

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
2	Set up/orient components	1.3	Use appropriate personal protective equipment (PPE) in accordance with SOPs
		1.4	Interpret drawing information and a range of tolerances that apply to components and establish datums
		2.1	Undertake pre-start checks in accordance with SOPs
		2.2	Observe correct safety procedures and check all equipment for safe operation
3	Select and activate part programs	2.3	Determine the most appropriate method of clamping/support to minimise distortion and maximise measuring access
		2.4	Set up and orient component/fixture/clamping devices
		3.1	Identify and verify part program, as required
		3.2	Activate selected part program in accordance with SOPs
4	Prepare CMM	4.1	Determine probe configuration according to specifications
		4.2	Adjust probe configuration on CMM according to SOPs
		4.3	Check probe angles for compliance and adjust, as required
		4.4	Re-calibrate CMM
		4.5	Align probes manually for one-off components
5	Measure components	5.1	Edit part program to compensate for errors or changes to component specifications
		5.2	Measure components and check for conformance to specification

Elements describe the essential outcomes.

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

5.3 Produce data/report

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, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

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

- manual machines
- machines fitted with microprocessors
- horizontal vertical and gantry tie machines

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

- solid trigger probes
- electronic trigger probes

Measure components include the following:

- those which can be measured directly and those that require measurements to be constructed mathematically

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM12020B Set and operate coordinate measuring machines

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 MEM12020 Set and operate coordinate measuring machines

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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 and drawings for selecting appropriate methods for measuring components using coordinate measuring machines (CMMs)
- selecting and setting up and orienting appropriate component/fixture/ clamping device to minimise distortion and maximise measuring access
- selecting and loading part programs and activating in accordance with SOPs
- loading and configuring probes, checking probes angles and adjusting for compliance and re-setting/re-calibrating CMM in accordance with specifications
- manually aligning probes for one off components
- identifying problems/errors in programs and carrying out editing to ensure accurate operation
- checking results against drawings/specifications and interpreting for non-conformance and completing reports.

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)
- principles and methods of coordinate measurement
- principles and interpretation of geometric tolerancing
- task-related information, symbols and terminology
- pre-start checks
- types and functions of various fixtures/clamping devices
- principles and methods of clamping
- efficient set-up/orientation procedure
- procedures to locate and activate part program
- procedures to verify changes/upgrades to part programs
- various probes and their uses and configurations and setting and adjusting probes

- requirements and procedures for re-setting/re-calibrating the CMM
- procedure and reason for taking manual hits
- procedures for editing part programs
- procedure for interpreting results
- procedure for maintaining records and reporting procedures
- techniques, tools and equipment to measure components.

Assessment Conditions

- Assessors must:
 - have vocational competency in setting and operating coordinate measuring machines 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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