



Australian Government

MEM12021 Program coordinate measuring machines

Release: 1

MEM12021 Program coordinate measuring machines

Modification History

Release 1. Supersedes and is equivalent to MEM12021B Program coordinate measuring machines

Application

This unit of competency defines the skills and knowledge required to write, trial and edit basic programs for a range of coordinate measuring machines (CMMs) to measure features of a part in a single work plane using a single probe.

Appropriate levels of measuring, computer and engineering drawing skills should be selected with this unit.

Where programming using multiple probes and more than one plane is required unit MEM12022 Program coordinate measuring machines (advanced) 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

MEM09002	Interpret technical drawing
MEM12003	Perform precision mechanical measurement
MEM12023	Perform engineering measurements
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.
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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	Identify part program parameters	2.1	Select appropriate units to comply with specifications
		2.2	Specify part program name according to SOPs
3	Establish single probe configurations	3.1	Determine single probe configuration
		3.2	Determine probe angles and qualify in accordance with SOPs
4	Position/align component	4.1	Position and orient component/part to specifications
		4.2	Create manual alignment according to SOPs
		4.3	Create single direct computer control (DCC) alignment according to SOPs
5	Measure features	5.1	Measure features and define probe movement parameters according to SOPs
		5.2	Dimension basic features according to specifications
		5.3	Report operator notes
		5.4	Insert dimension descriptions
6	Verify and back	6.1	Verify execution and accuracy of program according to

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up the program

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

SOPs

- 6.2 Edit program, if required
- 6.3 Output results to various formats according SOPs
- 6.4 Archive and back up program

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

No range of conditions provided for this unit.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM12021B Program 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 MEM12021 Program 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 occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- selecting appropriate units and identifying part program in accordance with current identification and/or quality system to comply with specifications
- determining single probe configuration and calculating/determining and qualifying probe angles in accordance with SOPs
- undertaking numerical operations, geometry and calculations/formula applicable to programming coordinate measuring machine (CMM)
- positioning/aligning/securing component/part to appropriate orientation on CMM table and complying with probe configuration and calibrated angles
- taking an appropriate number of hits to create an accurate manual alignment
- demonstrating the correct procedure for creating direct computer control (DCC) alignment
- measuring features in correct sequence and location in a single work plane
- dimensioning basic features, including circles and points
- verifying execution and accuracy of program and editing according to SOPs, as required
- outputting results to various formats, including printer, disc or other format and backing up and archiving program, as required.

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
- procedure for producing the part program
- procedures and parameters for naming programs
- procedures and reasons for determining single probe configuration
- procedures for determining/calculating probe angles
- procedures and parameters for qualification
- specifications for the program

- criteria for selecting specific units
- reasons for the specific location and aligning/securing the component/part
- method of securing/clamping
- methodology used to create manual alignment for the part
- procedures for creating a single DCC alignment and reasons for selection
- criteria for defining probe movement
- procedures for verifying correct probe movement
- dimensioning techniques
- procedures for running the program and verifying the results
- editing process and explanations
- method used to archive and back up the program
- access limitations by personnel and quality control guidelines
- procedures for outputting results to various formats.

Assessment Conditions

- Assessors must:
 - have vocational competency in programming 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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