



Australian Government

MEM24007 Perform ultrasonic thickness testing

Release: 1

MEM24007 Perform ultrasonic thickness testing

Modification History

Release 1. Supersedes and is equivalent to MEM24007B Perform ultrasonic thickness testing.

Application

This unit of competency defines the skills and knowledge required to perform ultrasonic thickness testing in a range of industrial applications including fabrications, structures and components across a wide range of industries where knowledge of metallurgy associated with the level of application in this unit is required.

Ultrasonic tests are performed on critical component or structural zones. Re-assessment of competency may be required at regular intervals in accordance with Australian Standards or other relevant standards. Actual and potential defects are to be considered, together with ongoing abnormalities.

Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices.

This unit should not be selected when unit MEM24008 Perform ultrasonic testing has already been selected.

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

Where the selection and use of engineering measurement is required unit MEM12023 Perform engineering measurements should also be selected.

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

No licensing or legislative requirements apply to this unit at the time of publication. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in AS ISO 9712 Non-destructive testing — Qualification and certification of NDT personnel.

Band: A

Unit Weight: 2

Pre-requisite Unit

MEM11011 Undertake manual handling

MEM13015 Work safely and effectively in manufacturing and engineering

MEM16006 Organise and communicate information

MEM18001 Use hand tools

Competency Field

Non-destructive testing

Unit Sector

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
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, job sheets or work instructions
2. Prepare inspection areas for ultrasonic thickness testing	2.1 Clean inspection areas and prepare for testing using appropriate procedures and materials 2.2 Carry out preparation processes in accordance with the relevant procedures 2.3 Assess inspection areas visually for obvious discontinuities
3. Perform tests	3.1 Identify nominated ultrasonic thickness test from SOPs 3.2 Prepare test equipment in accordance with manufacturers' instructions 3.3 Carry out ultrasonic tests in accordance with relevant standards 3.4 Maintain ultrasonic test equipment and store in accordance with SOPs
4. Report the results of ultrasonic thickness test(s)	4.1 Identify and confirm basic thicknesses and explain in accordance with organisational standards and/or procedures 4.2 Report test results including an accurate identification of location and size of discontinuities in accordance with organisational standards and/or procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

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.

Discontinuities include one or more of the following:	• thickness measurement of corrosion • delamination of nonferrous or ferrous alloys from composite materials.
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Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM24007B Perform ultrasonic thickness testing.

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 MEM24007 Perform ultrasonic thickness testing

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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 and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications and standards for performing ultrasonic thickness testing
- preparing the area for testing and identifying discontinuities including observed changes in material homogeneity and defects in accordance with procedures
- carrying out ultrasonic thickness testing using techniques and equipment appropriate for material/s to be tested and interpreting and confirming basic thickness in accordance with procedures on at least two occasions
- undertaking numerical operations and calculations associated with performing ultrasonic thickness testing
- reporting test results in accordance with procedures and customer service requirements on at least two occasions.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

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)
- cleaning and preparation processes, procedures and work health and safety (WHS) requirements in relation to the preparation process for different test surfaces
- established assessment procedures and techniques
- basic principles of ultrasonic thickness testing and properties and behaviour of ultrasound
- basic concepts associated with frequency, velocity, wavelength and amplitude
- generation of ultrasound
- types of discontinuities and their consequences
- procedures, tools, equipment, techniques and system verification checks necessary to carry out the ultrasonic thickness test
- advantages and limitations of ultrasonic thickness testing
- basic maintenance and storage procedures for testing equipment

- common basic defects, indications and thicknesses
- ultrasonic thickness testing equipment
- types of displays including a-scan display and a b-scan display
- types of couplants and their characteristics
- straight beam testing method including:
 - calibration of thickness testing equipment
 - frequency
 - probe size and shape
 - thickness testing
 - plate testing to acceptable standards within the scope of this unit
- recording and reporting including job records, routine reports and codes and standards
- methods and/or procedures for reporting test results
- variables affecting test results and methods of controlling them
- component variables including size and geometry, distance location from entry surface, orientation to entry surface and reflecting characteristics of back wall
- the following abnormalities:
 - thickness measurement of corrosion
 - laminations of nonferrous alloys, ferrous alloys, steels and composite materials.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing ultrasonic thickness testing 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 that 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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