



Australian Government

MEM24004 Perform magnetic particle testing

Release: 1

MEM24004 Perform magnetic particle testing

Modification History

Release 1. Supersedes and is equivalent to MEM24004B Perform magnetic particle testing.

Application

This unit of competency defines the skills and knowledge required to perform magnetic particle testing in a range of industrial applications including fabrications, structures and components across a wide range of industries to Level 2 (AS 3669 Non-destructive testing — Qualification and approval of personnel — Aerospace and AS ISO 9712 Non-destructive testing — Qualification and certification of NDT personnel) or equivalent.

Magnetic particle testing is performed on critical component or structural zones. Re-assessment of competency at regular intervals may be required in accordance with Australian Standards or other relevant standards. Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components, structures or aircraft components.

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.

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: B

Unit Weight: 4

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

MEM24012 Apply metallurgical principles

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
2. Prepare inspection areas for magnetic particle testing	2.1 Identify inspection areas, clean and prepare for testing using appropriate procedures and materials 2.2 Carry out preparation processes in accordance with the relevant procedures and statutory requirements 2.3 Assess inspection areas visually and identify obvious discontinuities
3. Perform tests	3.1 Select the most appropriate magnetic particle test for the material and/or application 3.2 Select testing equipment and prepare in accordance with standards and/or procedures 3.3 Carry out magnetic particle test in accordance with relevant standards and specifications 3.4 Check magnetic particle testing equipment for defects, and maintain and store in accordance with procedures and manufacturer instructions
4. Interpret and report the results of magnetic particle test(s)	4.1 Assess indications and detect defects and classify in accordance with national and international codes and standards 4.2 Confirm defects in accordance with organisational procedures and industry practices 4.3 Report test results in accordance with organisational procedures, accepted industry practices and customer service requirements

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.

Preparation processes include:

- surface cleaning and drying.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM24004B Perform magnetic particle 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 MEM24004 Perform magnetic particle 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, charts, lists, relative testing standards and other reference documentation for performing magnetic particle testing
- preparing the area for testing and identifying discontinuities in accordance with procedures
- selecting appropriate testing techniques and carrying out magnetic particle testing, checking and confirming basic indicators and identifying all defects in accordance with procedures on at least two occasions
- undertaking numerical operations and calculations associated with performing magnetic particle 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 and procedures and work health and safety (WHS) requirements in relation to the preparation process
- established assessment procedures and techniques
- types of discontinuities and their consequences
- magnetic particle testing techniques and procedures
- system verification checks necessary to carry out the magnetic particle tests
- principles, applications, advantages and limitations of magnetic particle testing
- basic maintenance and storage procedures for testing equipment
- types of magnetism including:
 - magnetic properties, materials and circuits
 - relative permeability of common engineering materials

- magnetic discontinuity and leakage fields
- types of equipment and features including portable, stationary and automated
- nature and properties of different types of magnetising current
- current requirements for testing
- media types including advantages and limitations of dry powders and fluid suspensions
- quality control of media and viewing conditions
- disposal procedures and environment care
- preparation of parts
- effect of surface coatings on sensitivity and surface roughness
- dressing of welds
- interpretation of indications
- lighting conditions
- use of magnification
- factors influencing appearance
- common basic defects including spurious indications and false indications
- surface and sub-surface indications
- methods and/or procedures for reporting test results.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing magnetic particle 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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