



Australian Government

MEM24041 Undertake basic magnetic particle tests

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Modification History

Release	Comments
1	This unit of competency was first released in MEM Manufacturing and Engineering Release 5.0.

Application

This unit of competency defines the skills and knowledge required to undertake basic magnetic particle testing techniques in a range of industrial applications. Personnel are required to follow written or verbal test instructions and use specified test equipment/materials. They are not responsible for either the choice of test method/technique used or the interpretation of results.

Basic magnetic particle tests are performed on critical components or structural zones. Personnel are required to consider actual and potential defects as well as ongoing abnormalities in fabrications, structures and/or critical components.

This unit of competency applies to non-destructive testing (NDT) technicians who are performing basic magnetic particle tests as defined in Australian and international codes and standards in manufacturing, engineering and other associated industry sectors requiring NDT testing. The work is performed under the general supervision of NDT technicians recognised as competent in higher levels of magnetic particle testing, professional engineers and scientists; engineering technologists; and production, operations and maintenance managers.

This unit should not be selected when unit MEM24024 Undertake magnetic particle tests has already been selected.

Where reading and interpretation of technical drawings is required Unit MEM09229 Read and interpret technical drawings 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 hand tools are required Unit MEM18001 Use hand tools 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.

Licensing/Regulatory Information

Assessment as competent against MEM24041 Undertake basic magnetic particle tests may contribute to certification against the Australian NDT standards where the assessment of this unit of competency is carried out in conjunction with an examining authority as described in AS ISO 9712 NDT – Qualification and certification of personnel, or subsequent Standards.

Pre-requisite unit(s)

MEM13015 Work safely and effectively in manufacturing and engineering

MEM16006 Organise and communicate information

Competency field(s)

Non-destructive testing

Unit sector(s)

N/A

Elements and Performance Criteria

Elements	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 Comply with relevant WHS and regulatory requirements, codes of practice, standards, and standard operating procedures (SOPs) for basic magnetic particle testing 1.2 Use appropriate personal protective equipment (PPE) in accordance with SOPs 1.3 Identify job requirements from specifications
2. Prepare for testing	2.1 Assemble all specified testing equipment, materials and containers and safety equipment 2.2 Identify inspection area and determine if special access requirements are required 2.3 Clean and prepare inspection areas for testing using appropriate test procedures and materials 2.4 Assess inspection areas visually to identify obvious discontinuities
3. Conduct basic magnetic particle tests	3.1 Identify nominated 'yoke' or 'bench' magnetic particle testing procedure from SOPs 3.2 Prepare test equipment and materials in accordance with relevant standards and/or operating procedures 3.3 Select the test media and apply the test in accordance with workplace practices and specifications 3.4 Conduct the magnetic particle tests in accordance with relevant work instructions and WHS requirements

	3.5 De-magnetise material according to specifications 3.6 Record any site observations that may affect results
4. Report results of basic magnetic particle tests	4.1 Review conduct of the test and confirm test procedures were applied correctly 4.2 Monitor indications and determine whether they are true or false 4.3 Determine whether indications are relevant or non-relevant 4.4 Determine type of discontinuity for each relevant indication 4.5 Apply acceptance criteria to discontinuities to determine the presence of common defects 4.6 Seek advice for problems outside technical competence or knowledge 4.7 Report test results and complete all job records in accordance with relevant standards and/or procedures
5. Maintain a safe work environment	5.1 Use established safe work practices and personal protective equipment to ensure personal safety and that of others 5.2 Minimise environmental impacts of testing and generation of waste 5.3 Restore test site, clean inspection area and equipment and dispose of all waste in accordance with enterprise procedures 5.4 Store and maintain magnetic particle testing equipment in accordance with standard operating procedures and WHS 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 one (1) or more of the following:	• surface cleaning • drying.
Magnetic media include one (1) or more of the following:	• dry magnetic powders such as iron oxide • wet magnetic powders in a carrier fluid such as colour contrast or fluorescent dyes, hydrocarbons or water; aerosols.
Magnetic particle test equipment includes one (1) or more of the following:	• simple pole magnets • yokes, AC/DC bridges • bench units.

Unit Mapping Information

Current Code and Title	Previous Code and Title	Comments	Equivalence
MEM24041 Undertake basic magnetic particle tests		This unit has been created to address a skill or task required by industry that is not covered by an existing unit of competency	Newly created

Assessment Requirements for MEM24041 Undertake basic magnetic particle tests

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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. Each specimen tested shall be different in character, i.e. in product form, material specification, shape, size, or discontinuity type and be representative of products typically tested in the industrial sector.

Evidence required includes:

- preparing the inspection area for testing and identifying discontinuities
- complying with WHS requirements during basic magnetic particle testing
- following work instructions and workplace procedures for undertaking basic magnetic particle tests and applying relevant standards and specifications
- applying test media and performing basic magnetic particle testing using specified techniques for materials to be tested
- checking and confirming basic indicators and identifying all defects in accordance with procedures
- performing basic de-magnetisation
- reporting test results using standard workplace forms
- conducting testing with minimal environmental impact.

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:

- basic terminology and concepts for AC/DC electricity, magnetism, generation of magnetic fields, permanent magnetism
- advantages and limitations of magnetic particle testing
- scope and basic principles of magnetic particle testing performed in job role
- advantages and limitations of magnetic particle test equipment

- procedures for carrying out 'yoke' and 'bench' magnetic particle tests
- surface preparation, procedures and WHS requirements in relation to the preparation process
- magnetic particle application methods including application method for wet and dry particles
- safe use of toxic and flammable materials such as aerosols and solvents
- types of discontinuities and their consequences
- definition of a defect and examples of common defects
- established assessment procedures and techniques
- standard recording and reporting formats and procedures for reporting test results
- basic maintenance and storage procedures for testing equipment
- basic de-magnetisation requirements
- relevant hazards, health, safety and environment requirements relevant to job role including WHS regulations, safe work procedures and use of Personal Protective Equipment (PPE).

Assessment Conditions

- Assessors must:
 - have vocational competency in undertaking basic magnetic particle tests at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the current vocational education and training legislation, frameworks and/or standards.
- 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.

Link

Companion volumes, including implementation guides, are found on the national training register - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=45a7f1d5-61a5-447a-9688-7abbd7e1a5c7>.