



Australian Government

MEM18110 Perform basic penetrant testing

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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 perform basic penetrant testing procedures and techniques in a range of metal fabrication and welding trade related industrial applications including fabrications, structures and components across a wide range of industries.

Penetrant testing is performed on critical component or structural zones and actual and potential defects are considered, together with ongoing abnormalities.

This unit should not be selected when unit MEM24022 Undertake penetrant tests 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 industrial chemicals is required unit MEM13003 Work safely with industrial chemicals and materials 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.

Band: A

Unit Weight: 2

Licensing/Regulatory Information

Assessment as competent against MEM18110 Perform basic penetrant testing may contribute to certification against Australian NDT Standards where assessment in 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)

MEM11011 Undertake manual handling

MEM13015 Work safely and effectively in manufacturing and engineering

MEM16006 Organise and communicate information

MEM18001 Use hand tools

Competency field(s)

Maintenance and diagnostics

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 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 basic penetrant 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 and identify obvious discontinuities
3. Perform basic tests	3.1 Identify nominated test from SOPs 3.2 Prepare test equipment in accordance with relevant standards and/or procedures 3.3 Select test media and apply in accordance with workplace practices and specifications 3.4 Carry out penetrant test in accordance with relevant work instructions 3.5 Maintain penetrant testing equipment and store in accordance with SOPs
4. Report the results of penetrant tests	4.1 Check and confirm basic indications and identify defects 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
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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.
Obvious discontinuities include:	• observed changes in material homogeneity.
Reporting includes:	• accurate identification of location and size of discontinuities.

Unit Mapping Information

Current Code and Title	Previous Code and Title	Comments	Equivalence
MEM18110 Perform basic penetrant testing	MEM24001 Perform basic penetrant testing	Superseded	Equivalent

Assessment Requirements for MEM18110 Perform basic penetrant 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 and other reference documentation for performing basic penetrant testing
- preparing the area for testing and identifying discontinuities including observed changes in material homogeneity in accordance with procedures
- applying test media and carrying out penetrant testing on at least two occasions using techniques appropriate for material/s to be tested, checking and confirming basic indicators and identifying all defects in accordance with procedures
- 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), relevant to penetrant testing
- cleaning and preparation processes and procedures and work health and safety (WHS) requirements in relation to the preparation process
- consequences of incorrect preparation for basic penetrant testing
- precleaning methods and their areas of use including solvents, vapour degrease, etching, detergents, paint removers and mechanical methods
- basic concepts and principles of non-destructive testing (NDT) including general terms, purpose of NDT and areas of application

- scope and basic description of penetrant testing
- classification of penetrants according to viewing characteristics:
 - colour
 - contrast
 - fluorescent
- general properties of penetrants including penetrability, removability and visibility
- emulsifier and developer types
- use of standard test panels
- established inspection procedures and techniques
- types of discontinuities and their consequences
- procedure for carrying out penetrant testing including:
 - penetrant application and dwell times
 - penetrant removal
 - developer application
 - dry powder and development time
 - factors affecting indications
 - non-relevant indications
 - post-cleaning methods and their areas of use
- basic maintenance and storage procedures for testing equipment
- WHS requirements including storage requirements
- definition of a defect and common basic defects
- methods and/or procedures for reporting test results.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing basic penetrant testing 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>.