

## **MEM24002B Perform penetrant testing**

<b>Unit descriptor</b>	This unit covers performing penetrant testing in a range of industrial applications.
<b>Prerequisites</b>	
Path 1	MEM18001C Use hand tools MEM24012B Apply metallurgy principles
<b>Competency field</b>	Non-destructive testing
<b>Application of the competency</b>	<p>This unit applies to penetrant testing techniques on fabrications, structures and components across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent by portable penetrant testing, processing on a dedicated penetrant line, visible dye and fluorescent methods.</p> <p>The work can relate to scheduled and unscheduled maintenance activities using general tools and specific penetrant testing equipment as specified in maintenance documentation, testing procedures or operator instructions. Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components, structures and/or aircraft components. Penetrant tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&amp;S regulations. 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 ISO 9712. 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.</p>
<b>Related units</b>	<p>Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.</p> <p>Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected.</p>
<b>Band</b>	A

<b>Unit weight</b>	4
<b>Notes</b>	This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V).
<b>Elements</b> Elements are the essential outcomes of the unit of competency.	<b>Performance criteria</b> Together, performance criteria specify the requirements for competent performance. Text in <i>italics</i> is explained in the range statement following.
1 Prepare inspection areas for penetrant testing	<p>1.1 Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials.</p> <p>1.2 <i>Preparation processes</i> are carried out in accordance with the relevant procedures, statutory and OH&amp;S requirements.</p> <p>1.3 Inspection areas are visually assessed and <i>obvious discontinuities</i> are identified.</p>
2 Perform penetrant testing	<p>2.1 The most appropriate penetrant test for the material/application is selected.</p> <p>2.2 Test equipment is selected and prepared in accordance with standards and/or procedures.</p> <p>2.3 Appropriate test media is selected and applied in accordance with workplace/industry practices.</p> <p>2.4 Penetrant test is carried out in accordance with relevant standards, specifications and OH&amp;S requirements.</p> <p>2.5 Penetrant test equipment is checked for defects, maintained and stored in accordance with procedures, OH&amp;S requirements and manufacturer instructions.</p>
3 Interpret and report the results of penetrant test(s)	<p>3.1 Indications are assessed and defects are detected and classified in accordance with national and international codes and standards.</p> <p>3.2 Defects are confirmed in accordance with enterprise procedures and industry practices.</p> <p>3.3 Test results are <i>reported</i> in accordance with enterprise procedures, accepted industry practices and customer service requirements.</p>

## Range statement

The range statement provides information about the context in which the unit of competency is carried out. The variables and scope cater for different work requirements, work practices and knowledge between States, Territories and the Commonwealth, and between organisations and workplaces. The range statement relates to the unit as a whole and provides a focus for assessment. Text in italics in the performance criteria is explained here.

The following variables may be present and may include, but are not limited to, the examples listed under the scope. All work is undertaken to relevant legislative requirements, where applicable.

Variable	Scope
<i>Preparation processes</i>	Surface cleaning and drying
<i>Obvious discontinuities</i>	Observed changes in material homogeneity
<i>Reported</i>	Accurate identification of location and size of discontinuities

## Evidence guide

The evidence guide specifies the evidence required to demonstrate achievement in the unit of competency as a whole. It must be read in conjunction with the unit descriptor, performance criteria, range statement and the assessment guidelines for the Metal and Engineering Training Package.

### Overview of assessment requirements

A person who demonstrates competency in this unit must be able to perform penetrant testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

### Context of assessment

This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

### Interdependent assessment

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing penetrant testing in a range of industrial applications or other units requiring the exercise of the skills and knowledge covered by this unit.

### Method of assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards,

manuals and reference materials.

**Consistency of performance** Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

**Required skills**

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- conducting visual inspections
- identifying discontinuities and defects
- selecting appropriate testing techniques and procedures
- using decision making skills
- assessing risk
- performing measurements needed to meet the requirements of this unit
- entering routine and familiar information onto proformas and standard workplace forms
- locating, reading and interpreting information on written job instructions, specifications, drawings, charts, lists and other reference documentation
- planning, sequencing operations

**Required knowledge**

Look for evidence that confirms knowledge of:

- cleaning and preparation processes for a range of test surfaces
- procedure, statutory and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- types of discontinuities and their consequences/effect on the material
- penetrant testing techniques and procedures for a range of situations
- tools, equipment, techniques
- principles and applications of penetrant testing techniques
- hazards and safety requirements associated with penetrant testing
- maintenance and storage procedures for test equipment
- common faults and damage

- range of defects
- meaning and application of national and international codes and standards
- methods/procedures for reporting test results
- implications of test results for the particular material/application
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards
- use and application of personal protective equipment
- safe work practices and procedures
- relevant hazards and control measures related to the competency