

MEM24001B**Perform basic penetrant testing**

Unit descriptor	This unit covers performing basic penetrant testing procedures in a range of industrial applications.
Prerequisites	
Path 1	MEM18001C Use hand tools
Competency field	Non-destructive testing
Application of the competency	<p>This unit applies to basic penetrant testing techniques on fabrications, structures and components across a wide range of industries and restricted to basic visible dye and/or process penetrant line methods.</p> <p>The work can relate to scheduled and unscheduled maintenance activities, using general tools, specific penetrant testing equipment as specified in maintenance documentation, testing procedures or operator instructions.</p> <p>Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components and structures.</p> <p>Penetrant testing is performed on critical component or structural zones.</p> <p>All testing must be completed with particular attention to personal safety and OH&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.</p> <p>Materials and chemicals which are subject to codes and regulations – for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products – must be subject to safe work habits and must be stored and used in accordance with safe work practices.</p>
Related units	<p>This unit should not be selected when Unit MEM24002B (Perform penetrant testing) has already been selected.</p> <p>Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.</p>
Band	A
Unit weight	2
Notes	There are no notes for this unit.

Elements	Performance criteria
Elements are the essential outcomes of the unit of competency.	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 basic penetrant testing	1.1 Inspection areas are cleaned and prepared for testing using appropriate procedures and materials. 1.2 <i>Preparation processes</i> are carried out in accordance with the relevant procedures and OH&S requirements. 1.3 Inspection areas are visually assessed and <i>obvious discontinuities</i> are identified.
2 Perform basic penetrant testing	2.1 Nominated test is identified from standard operating procedures. 2.2 Test equipment is prepared in accordance with standard operating procedures. 2.3 Test media is selected and applied in accordance with workplace practices and specifications. 2.4 Penetrant test is carried out in accordance with relevant work instructions and OH&S requirements. 2.5 Penetrant testing equipment is maintained and stored in accordance with standard operating procedures and OH&S requirements.
3 Report the results of penetrant test(s)	3.1 Basic indications are checked and defects are identified in accordance with enterprise standards and/or procedures. 3.2 Basic indications are confirmed in accordance with enterprise standards and/or procedures. 3.3 Test results are <i>reported</i> in accordance with enterprise standards and/or procedures.

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 basic 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 basic penetrant testing 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 techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. 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: <ul style="list-style-type: none">• preparing inspection areas• identifying discontinuities• applying procedures• applying test media

- applying principles of penetrant testing techniques
- identifying defects
- reading and interpreting routine information on written job instructions, specifications and standard operating procedures.
- following oral instructions
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes
- precleaning methods and their areas of use – solvents, vapour degrease, etching, detergents, paint removers, mechanical methods
- consequences of incorrect preparation
- procedures and OH&S requirements in relation to the preparation process
- basic concepts and principles of NDT; general terms, purpose of NDT and areas of application of NDT
- scope and basic description of test
- general properties of penetrants – penetrability, removability, visibility
- emulsifier types
- developer types
- use of standard test panels
- established inspection procedures and techniques
- types of discontinuities and their consequences
- procedure for carrying out penetrant testing
- penetrant application
- dwell times
- penetrant removal
- developer application
- dry powder
- development time
- factors affecting indications
- non-relevant indications
- post-cleaning methods and their areas of use

- basic maintenance and storage procedures for testing equipment
- OH&S requirements including storage requirements
- definition of a defect and common basic defects
- methods/procedures for reporting test results