Australian Government

Department of Education, Employment and Workplace Relations

MEM24004B Perform magnetic particle testing

Release: 2

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Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers performing magnetic particle testing in a range of industrial applications.

Application of the Unit

Application of the unit	This unit applies to magnetic particle testing techniques on fabrications, structures and components across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent. The work can relate to scheduled and unscheduled maintenance activities using general tools specific testing equipment as specified in maintenance documentation, testing procedures or operators instructions. Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components, structures and/or aircraft components. Magnetic particle testing is 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 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. 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 power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected. Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected. **Band:** 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).

	Unit Weight: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools
	MEM24012C	Apply metallurgy principles

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for magnetic particle testing	1.1. Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Perform magnetic particle testing	2.1. The most appropriate magnetic particle test for the material/application is selected. 2.2. Testing equipment is selected and prepared in accordance with standards and/or procedures. 2.3. Magnetic particle test is carried out in accordance with relevant standards, specifications and OH&S requirements. 2.4. Magnetic particle testing equipment is checked for defects, and maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.
3. Interpret and report the results of magnetic particle tests	3.1. Indications are assessed and defects are detected and classified in accordance with national and international codes and standards. 3.2. Defects are confirmed in accordance with enterprise procedures and industry practices. 3.3. Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • interpreting and following procedures

REQUIRED SKILLS AND KNOWLEDGE

- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques, equipment and procedures
- reading, interpreting and applying relative testing standards
- reading, interpreting and applying relative conformance standards
- assessing risk
- undertaking calculations using formulae
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes
- procedures and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- types of discontinuities and their consequences
- magnetic particle testing techniques and procedures for a range of situations
- system verification checks necessary to carry out the magnetic particle test
- principles and applications of magnetic particle testing
- advantages and limitations of magnetic particle testing
- hazards and safety precautions associated with magnetic particle testing
- basic maintenance and storage procedures for testing equipment
- types of magnetism;
- magnetic properties
- magnetic materials
- magnetic circuits
- relative permeability of common engineering materials
- magnetic discontinuity, leakage fields
- types of equipment - portable, stationary, automated etc.
- equipment features
- nature and properties of the various types of magnetising current
- current requirements for testing
- media types - advantages and limitations of dry powders and fluid suspensions
- quality control of media, viewing conditions
- disposal procedures
- environment care
- preparation of parts
- effect of surface coatings on sensitivity
- effect of surface roughness
- dressing of welds

REQUIRED SKILLS AND KNOWLEDGE
• interpretation of indications • lighting conditions • use of magnification • factors influencing appearance • spurious indications, false indications • surface and sub-surface indications • common basic defects • methods/procedures for reporting test results • 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

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform magnetic particle testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	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.
Context of and specific resources for 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. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing magnetic particle 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 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.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation processes	Surface cleaning and drying

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing