



Australian Government

Department of Education, Employment and Workplace Relations

MEM24007B Perform ultrasonic thickness testing

Release: 1

MEM24007B Perform ultrasonic thickness testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing ultrasonic thickness testing in a range of industrial applications. Knowledge of metallurgy associated with the level of application in this unit is required.
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Application of the Unit

Application of the unit	<p>This unit applies to inspecting, interpreting and reporting on ultrasonic testing techniques of fabrications, structures and components. Testing is across a wide range of industries and includes identifying abnormalities such as thickness measurement of corrosion, laminations of non-ferrous/ferrous alloys steels, composite materials. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific ultrasonic testing equipment as specified in maintenance documentation, testing procedures or operators instructions.</p> <p>Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components and structures on a wide range of applications. Ultrasonic 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&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 - are subject to safe work habits and must be stored and used in accordance with safe work practices.</p> <p>This unit should not be selected when Unit MEM24008B (Perform ultrasonic testing) has already been selected.</p> <p>Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected.</p> <p>Where power tools are required, Unit MEM18002B (Use</p>
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	power tools/hand held operations) should also be selected. Band: A Unit Weight: 2
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for ultrasonic thickness testing	1.1. Inspection areas are cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements. 1.3. Inspection areas are visually assessed for obvious discontinuities.
2. Perform ultrasonic thickness testing	2.1. Nominated ultrasonic thickness test is identified from standard operating procedures. 2.2. Test equipment is prepared in accordance with standard operating procedures. 2.3. Ultrasonic tests are carried out in accordance with relevant standards and OH&S requirements. 2.4. Ultrasonic test equipment is maintained and stored in accordance with standard operating procedures and OH&S requirements.
3. Report the results of ultrasonic thickness tests	3.1. Basic thicknesses are identified and explained in accordance with enterprise standards and/or procedures. 3.2. Basic thicknesses are confirmed in accordance with enterprise standards and/or procedures. 3.3. Test results are reported in accordance with enterprise standards and/or procedures.

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: <ul style="list-style-type: none"> • interpreting and following procedures • identifying inspection areas • identifying discontinuities and defects • selecting appropriate testing techniques, equipment and procedures • performing calculations

REQUIRED SKILLS AND KNOWLEDGE

- assessing risk
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes for a variety of test surfaces
- procedures and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- basic principles of ultrasonic thickness testing
- properties and behaviour of ultrasound
- basic concepts associated with frequency, velocity, wavelength, amplitude
- generation of ultrasound
- types of discontinuities and their consequences
- procedures for carrying out ultrasonic thickness tests
- tools, equipment, techniques and system verification checks necessary to carry out the ultrasonic thickness test
- advantages and limitations of ultrasonic thickness testing
- hazards and safety requirements associated with ultrasonic thickness testing
- basic maintenance and storage procedures for testing equipment
- common basic defects
- indications and thicknesses
- methods/procedures for reporting test results
- ultrasonic thickness testing equipment
- types of displays:
 - a-scan display
 - b-scan display
- types of couplants, desirable characteristics
- straight beam testing method:
- calibration of thickness testing equipment
- frequency
- probe size and shape
- thickness testing
- plate testing
 - acceptance standards within the scope of this unit
- recording and reporting:
 - job records
 - routine reports
 - codes and standards
- variables affecting test results

REQUIRED SKILLS AND KNOWLEDGE

- methods of controlling variables
- component variables:
 - size and geometry
 - distance location from entry surface
 - orientation to entry surface
 - reflecting characteristics of back wall
- 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

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to perform ultrasonic thickness testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing ultrasonic thickness testing in a range of industrial applications, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>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.</p>

EVIDENCE GUIDE

Guidance information for assessment	
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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

Obvious discontinuities

Observed changes in material homogeneity

Reported

Accurate identification of location and size of discontinuities

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Non-destructive testing
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