

MEM24010B**Perform radiographic testing****Unit descriptor**

This unit covers operating radiographic testing equipment and applying the testing procedures in a range of industrial applications.

Prerequisites

Path 1

MEM13013B Work safely with ionizing radiation

MEM18001C Use hand tools

MEM24012B Apply metallurgy principles

Competency field

Non-destructive testing

Application of the competency

This unit applies to inspecting, interpreting, classifying and reporting on radiographic testing techniques of fabrications, structures and components.

Testing is across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent and includes identifying abnormalities such as corrosion, metal fatigue, deformation in non-ferrous/ferrous alloys steels, composite materials, fatigue cracks, stress corrosion cracking, manufacturing defects, thickness measurement and fit, mechanical and bonded repairs, welding defects and casting defects and/or aircraft components.

The work can relate to scheduled and un-scheduled maintenance activities using general tools and specific radiographic 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 and structures on a wide range of applications. Radiographic 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 and OH&S regulations.

Ionizing radiation equipment materials and chemicals, which are subject to codes and regulations, must be stored, used, and transported in accordance with safe work practices. 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.

Related units

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

A

Unit weight

6

Notes

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).

| Elements Elements are the essential outcomes of the unit of competency. | Performance criteria Together, performance criteria specify the requirements for competent performance. Text in <i>italics</i> is explained in the range statement following. |
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| 1 Prepare inspection areas for radiographic testing | 1.1 Inspection areas are identified, 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, statutory and OH&S requirements. 1.3 Inspection areas are visually assessed and obvious discontinuities are identified. |
| 2 Select and prepare radiographic test | 2.1 The most appropriate radiographic test for the material/application is selected. 2.2 Appropriate testing and processing equipment is selected and set up for various geometries in accordance with standards and/or procedures. 2.3 Quality of radiographic test is optimised. |
| 3 Perform radiographic testing | 3.1 Radiographic tests are carried out in accordance with relevant standards, codes, specifications and OH&S requirements. 3.2 Radiographs are set up and carried out for specialised applications. 3.3 Films are processed to maximise quality of image. 3.4 Films are processed to achieve optimum results. |
| 4 Maintain radiographic testing equipment | 4.1 Radiographic testing equipment is checked for defects, maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions. |
| 5 Monitor and ensure radiation safety | 5.1 Safety controls are set up and maintained. 5.2 Exposure to radiation employees and general public is minimised. 5.3 Radiation monitoring equipment is selected and used. |
| 6 Interpret and report the results of radiographic tests | 6.1 Conditions necessary to view and interpret radiographs are established. 6.2 Radiographs are interpreted/evaluated in accordance with applicable codes, standards and specifications. |

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| | 6.3 Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements. |
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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 |

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.

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| Overview of assessment requirements | A person who demonstrates competency in this unit must be able to perform radiographic 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 operating radiographic testing equipment and applying testing procedures 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:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques, equipment and procedures
- calculating and producing optimum quality radiographs
- effectively designing exposure and storage areas
- calculating shielding thicknesses
- reading, interpreting and applying relative testing standards
- reading, interpreting and applying relative conformance standards
- documenting and reporting
- assessing risk

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes for a range of test surfaces
- cleaning and preparation processes for a range of test surfaces
- assessment procedures and techniques
- types of discontinuities and their consequences/effect on the material
- procedure for carrying out each radiographic test
- principal types of X-ray generators and radioisotopes and their effect on radiographic sensitivity
- tools, equipment, techniques and system verification checks
- relevant standards, regulations and codes
- hazards associated with radiographic testing
- procedures for specialised radiographic applications

- principles of image formation, film and chemical properties and processing techniques
- various types of films and screens, their properties and effects on image quality
- maintenance and storage procedures for test equipment
- common faults and damage
- safety features of radioisotope cameras and X-ray equipment
- production of X-rays and gamma rays
- absorption of ionizing radiation by matter and the biological effects on living
- X-ray equipment
- gamma ray sources
- comparison of X-ray and gamma ray sources on basis of energy and intensity
- shielding thickness
- exposure calculations
- reciprocity law
- preparation and use of exposure charts, radiographic equivalence charts.
- exposure techniques
- equipment types
- recording and reporting
- safety aspects
- types of materials
- industrial applications
- set-up procedures
- 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