



**Australian Government**

# **MEM24009 Perform basic radiographic testing**

**Release: 1**

# **MEM24009 Perform basic radiographic testing**

## **Modification History**

Release 1. Supersedes and is equivalent to MEM24009B Perform basic radiographic testing.

## **Application**

This unit of competency defines the skills and knowledge required to perform basic radiographic testing procedures and work with ionizing radiation in open and closed sites on fabrication, structures and components across a wide range of industries and industrial applications. It applies to situations where knowledge of metallurgy associated with the level of application in this unit is required.

All testing must be completed with particular attention to personal and WHS 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.

This unit should not be selected when unit MEM24010 Perform radiographic testing has already been selected.

Where interpretation of technical drawings is required unit MEM09002 Interpret technical drawing should also be selected.

Where the selection and use of engineering measurement is required unit MEM12023 Perform engineering measurements should also be selected.

Where the selection and use of power tools are required unit MEM18002 Use power tools/hand held operations should also be selected.

No licensing or legislative requirements apply to this unit at the time of publication. 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 AS ISO 9712 Non-destructive testing — Qualification and certification of NDT personnel.

Band: A

Unit Weight: 2

## **Pre-requisite Unit**

MEM11011 Undertake manual handling

MEM13018 Work safely with ionizing radiation

MEM13015 Work safely and effectively in manufacturing and engineering

MEM16006 Organise and communicate information

MEM18001 Use hand tools

## **Competency Field**

Non-destructive testing

## Unit Sector

### Elements and Performance Criteria

| Elements                                                         | Performance Criteria                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i>                 | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                                                                                                                                                     |
| 1. Determine job requirements                                    | 1.1 Follow standard operating procedures (SOPs)<br>1.2 Comply with work health and safety (WHS) requirements at all times<br>1.3 Use appropriate personal protective equipment (PPE) in accordance with SOPs<br>1.4 Identify job requirements from specifications                          |
| 2. Prepare inspection areas ready for basic radiographic testing | 2.1 Clean radiographic specimens and prepare for testing using appropriate procedures and materials<br>2.2 Carry out preparation processes in accordance with the relevant procedures<br>2.3 Assess inspection areas visually and identify obvious discontinuities                         |
| 3. Set up radiographic test equipment                            | 3.1 Identify nominated test from SOPs<br>3.2 Set up radiation testing and processing equipment in accordance with manufacturers' specifications                                                                                                                                            |
| 4. Carry out basic radiographic tests                            | 4.1 Identify basic properties of X-rays and gamma rays<br>4.2 Apply safety practices and controls for minimising radiation exposure<br>4.3 Operate radiographic testing and safety equipment in accordance with relevant work instructions<br>4.4 Process films to achieve optimum results |

### Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

## Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

|                                  |                                                                                             |
|----------------------------------|---------------------------------------------------------------------------------------------|
| Preparation processes include:   | <ul style="list-style-type: none"><li>• surface cleaning and drying.</li></ul>              |
| Obvious discontinuities include: | <ul style="list-style-type: none"><li>• observed changes in material homogeneity.</li></ul> |

## Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM24009B Perform basic radiographic testing.

## Links

The MEM Metal and Engineering Training Package Companion Volume Implementation Guide is available from VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

# Assessment Requirements for MEM24009 Perform basic radiographic testing

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## Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications, relative testing and conformance standards for performing basic radiographic testing
- preparing the area for testing and identifying discontinuities including observed changes in material homogeneity and in accordance with procedures
- applying safety practices and controls for minimising radiation exposure including effectively designing exposure and storage areas and calculating shielding thickness in accordance with procedures
- carrying out basic radiographic testing using techniques and equipment appropriate for material/s to be tested, calculating and producing optimum quality radiographs on at least two occasions
- producing films to achieve optimum results and documenting and reporting test results in accordance with procedures and customer service requirements on at least two occasions.

*Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.*

## Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- cleaning and preparation processes for test surfaces
- assessment procedures and techniques
- types of discontinuities and their effect on the material
- procedures for carrying out each radiographic test and for specialised radiographic applications
- 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
- principles of image formation, film and chemical properties and processing techniques
- different 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 and comparison of them on basis of energy and intensity
- absorption of ionizing radiation by matter and the biological effects
- X-ray equipment
- gamma ray sources
- shielding thickness, exposure techniques and calculations
- reciprocity law
- preparation and use of exposure charts and radiographic equivalence charts
- equipment types and set-up procedures
- types of materials and industrial applications
- methods and/or procedures for reporting test results
- implications of test results for the particular material and/or application.

## Assessment Conditions

- Assessors must:
  - have vocational competency in performing basic radiographic testing at least to the level being assessed with relevant industry knowledge and experience
  - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015 or its replacement* and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible, assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

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