



Australian Government

Assessment Requirements for MEM24016

Perform eddy current array tests

Release: 1

Assessment Requirements for MEM24016 Perform eddy current array tests

Modification History

Release 1. New unit.

Performance Evidence

There must be evidence the candidate has demonstrated the ability to:

- review at least two eddy current array test specifications and identify:
 - relevant Australian and/or international standards
 - material test area
 - most appropriate eddy current array test technique and equipment
 - workplace access and WHS requirements for specified eddy current tests
- set up, calibrate and perform eddy current array tests to identify:
 - weld discontinuities and cracks
 - material conductivity
 - coating thickness
 - tube conformance to specifications
- interpret eddy current array test data from the above tests to identify:
 - material thickness
 - corrosion
 - discontinuities
 - conductivity
 - non-conductive coating thickness on coated metal plate and tube
- apply acceptance criteria to discontinuities and classify defects in accordance with national and international standards
- calculate the effect of probe lift on the amplitude and phase of test material
- prepare test reports in accordance with standards and test specifications and workplace procedures.

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

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- work health and safety (WHS) procedures and requirements in relation to eddy current array preparation and testing
- advantages of eddy current array testing over conventional eddy current testing

- limitations of eddy current array testing
- basic principles of electricity, magnetism, electromagnetism and eddy current testing including:
 - reactance – field made by eddy current
 - Biot-Savart law – definition, practical (right hand) rules
 - Amperes law – definition, applications (toroid, infinite coil, flat coil)
 - Lenz law – definition, auto-induction factor, mutual induction factor, coupling factor
 - induced currents – short circuit coil, metallic mass, skin effect and reactance
- materials that are suitable for eddy current array testing and their material properties
- cleaning and preparation processes for eddy current array testing equipment and test areas
- eddy current array equipment components and their function including components and controls for transmission, reception and data presentation
- types of eddy current array probes and their application including:
 - rigid and flexible surface
 - weld scan
 - rigid and flexible complex geometry
 - differential
 - absolute
 - reflection
 - bridge
- probe structure and operating principles and features including:
 - coil array
 - coil pattern (topology)
 - multiplexing
 - activation sequence
 - gain
 - frequency range
 - drift
- impact of test object phase and amplitude on eddy current array tests
- eddy current array test techniques for:
 - discontinuity testing in metal plate and pipe
 - metal thickness testing
 - conductivity measurement
 - testing the effects of heat treatment
 - determining non-conductive coating thickness over metal
- relationship between probe lift and material amplitude and phase
- processes to avoid coil mutual inductance
- types of discontinuities and their consequences
- classification and reporting of defects including:
 - corrosion

- metal fatigue
- deformation in nonferrous/ferrous alloys steels
- fatigue cracks
- stress corrosion cracking
- heat damage
- metal properties sorting
- manufacturing defects
- coating thickness measurement.
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Assessment Conditions

- Assessors must:
 - have vocational competency in undertaking eddy current array 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.
- There must be 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.

Links

Companion Volume Implementation Guides are found in VETNet -

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