



Australian Government

MEM08018 Electroplate engineering coatings

Release: 1

MEM08018 Electroplate engineering coatings

Modification History

Release 1. Supersedes and is equivalent to MEM08018B Electroplate engineering coatings

Application

This unit of competency defines the skills and knowledge required to apply engineering metallic/ceramic coatings to ferrous and non-ferrous metals and some non-metallic materials, e.g. plastics.

It applies to producing engineering coatings designed to promote wear resistance, protect against corrosion, and reclaim worn components. It also applies to manufacturing components (electroforming).

Where pre-treatment operations only are required unit MEM08002 Pre-treat work for subsequent surface coating should be selected.

Where straightforward operation of electroplating process is required unit MEM08003 Perform electroplating operations should be selected.

Where surface preparation operations are required unit MEM08011 Prepare surfaces using solvents and/or mechanical means and unit MEM08012 Prepare surfaces by abrasive blasting (basic), should also be selected as appropriate.

Where the 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 basic inspection of completed or partly completed products produced by others is required unit MEM15004 Perform inspection should also be selected.

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

Where construction of anodes, shields/robbars is required appropriate fabrication units should also be selected.

Where dogging/lifting is required appropriate materials handling units to suit regulatory requirements should also be selected.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Band: A

Unit Weight: 6

Pre-requisite Unit

MEM07001	Perform operational maintenance of machines/equipment
MEM08001	Perform wire, jig and barrel load/unload work
MEM08003	Perform electroplating operations
MEM11011	Undertake manual handling
MEM13003	Work safely with industrial chemicals and materials
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM18001	Use hand tools

Competency Field

Surface finishing

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	Determine job requirements	1.1	Follow standard operating procedures (SOPs)
		1.2	Comply with work health and safety (WHS) requirements at all times
		1.3	Use appropriate personal protective equipment (PPE) in accordance with SOPs
		1.4	Identify job requirements from specifications, job sheets or work instructions
2	Select treatments and processes/ equipment for producing engineering	2.1	Select appropriate treatment processes according to base metal type, the surface condition and relevant job specifications
		2.2	Select operating/process parameters to achieve required coating

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

	finishes	2.3	Select appropriate equipment, as required
3	Prepare work for engineering finishes	3.1	Mask (stop off) products for selective plating
		3.2	Construct conforming anodes and fit, where applicable
		3.3	Construct and fit shields and robbers, where applicable
		3.4	Carry out pre-treatment processes, where necessary
4	Monitor and control operating conditions and processes for engineering coatings	4.1	Set operating/process parameters to produce required surface conditions/specifications
		4.2	Monitor and confirm surface conditions of finished components and identify abnormalities
		4.3	Take corrective actions to rectify non-conforming conditions
5	Maintain solutions for engineering finishes	5.1	Check solution compositions and confirm to specification/operating range
		5.2	Determine adjustment requirements/additions
		5.3	Make additions to adjust solution composition to correct operating range as necessary

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

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, accessibility of the item, and local industry and regional contexts) are included.

Treatment processes include one (1) or more of the following:

- electroplating
- electroforming
- electroless plating

Operating/process parameters include one (1) or more of the following:

- treatment times and currents
- bath pH temperatures and densities
- anode conditions
- addition agent content
- cleanliness of contacts
- make-up
- maintenance of solution levels and purity

Coating includes one (1) or more of the following:

- hard chroming
- heavy nickel
- electroless nickel
- nickel composites
- heavy deposits of nickel, copper and bronze up to 10 mm

Equipment includes one (1) or more of the following:

- wire racks
- handling equipment
- barrels
- jigs
- shields
- robbers

Products include one (1) or more of the following:

Base materials, including:

- cast iron
- brass
- steels with machine welded sections

Masking materials include one (1) or more of the following:

- wax
- lacquers
- tapes

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, accessibility of the item, and local industry and regional contexts) are included.

- foils

Anodes include one (1) or more of the following:

- soluble
- insoluble auxiliary anodes

Solution compositions include one (1) or more of the following:

- cleaning
- pickling
- electroplating
- chromate
- acid dips

Checks include one (1) or more of the following:

- density
- titration
- pH

Adjustment includes one (1) or more of the following:

- strength of solutions
- temperature range

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for MEM08018 Electroplate engineering coatings

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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 on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- determining the composition of surfaces to be treated and selecting suitable methods and techniques for electroplated coating treatment
- preparing surfaces to be treated with pre-treatment process using masking and constructing/fitting shields/robbers, where necessary, and fitting anodes
- electroplating surfaces, monitoring the treatment process and adjusting solutions and operating parameters to meet specifications.

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)
- effects of plating process on different materials
- conditions affecting engineering finishes
- base metal types and the surface finish of untreated material
- mechanical/chemical and specialised electroplating pre-treatment processes
- process parameters for achieving different coatings
- characteristics of different surface finishes
- masking materials and masking techniques
- safe operation of equipment to produce engineering finishes
- current distribution principles
- methods of constructing/fabricating, fitting anodes and current capacity of conforming/auxiliary anodes
- role, construction, properties, applications, and positioning of shields and robbers
- finish requirements and permissible tolerances
- causes of electroplating process abnormalities and their related corrective actions
- purpose and application of simple tests including pH, titration and density
- calculations related to additions/adjustments to solution and of product surface area
- procedures for safe handling of chemicals.

Assessment Conditions

- Assessors must:
 - have vocational competency in electroplating engineering coatings 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. This must 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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