



Australian Government

Department of Education, Employment and Workplace Relations

MEM08018B Electroplate engineering coatings

Release: 1

MEM08018B Electroplate engineering coatings

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers applying engineering metallic/ceramic coatings to ferrous and non-ferrous metals and some non-metallic materials e.g. plastics.
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Application of the Unit

Application of the unit	This unit applies to producing engineering coatings designed to promote wear resistance, protect against corrosion, reclaim worn components. It also applies to manufacturing components (electroforming). For surface preparation operations, Unit MEM08011B (Prepare surfaces using solvents and/or mechanical means) and Unit MEM08012B (Prepare surfaces by abrasive blasting [basic]) should be selected as appropriate. Straightforward operation of electroplating process is covered by Unit MEM08003C (Perform electroplating operations). Where pre-treatment operations only are carried out, Unit MEM08002C (Pre-treat work for subsequent surface coating) should be selected. For basic inspection of completed or partly completed products produced by others, Unit MEM15004B (Perform inspection) should be selected. For construction of anodes, shields/robbars etc., the appropriate fabrication units should be selected. Where dogging/lifting is undertaken, the appropriate materials handling units should be selected. Band: A Unit Weight: 6
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07001B	Perform operational maintenance of machines/equipment
	MEM08001B	Perform wire, jig and barrel load/unload work
	MEM08003C	Perform electroplating operations
	MEM13003B	Work safely with industrial chemicals and materials
	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. Select treatments and processes/equipment for producing engineering finishes	1.1. Appropriate treatment processes are selected according to base metal type, surface condition and relevant job specifications. 1.2. Operating/process parameters are selected to achieve required coating. 1.3. Appropriate equipment is selected.
2. Prepare work for engineering finishes	2.1. Products are correctly masked (stopped off) for selective plating. 2.2. Where applicable, conforming anodes are constructed and fitted correctly. 2.3. Where applicable, shields and robbers are constructed and fitted. 2.4. Pre-treatment processes are carried out, where applicable.
3. Monitor and control operating conditions and processes for engineering coatings	3.1. Operating/process parameters are set to produce required surface conditions/specifications. 3.2. Surface conditions of finished components are monitored and confirmed and abnormalities are identified. 3.3. Corrective actions are taken to rectify non-conforming conditions.
4. Maintain solutions for engineering finishes	4.1. Solution compositions are checked and confirmed to specification/operating range. 4.2. Adjustment requirements/additions are determined. 4.3. Additions are made to adjust solution composition to correct operating range.

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:

- selecting treatments and processes/equipment for producing engineering finishes

REQUIRED SKILLS AND KNOWLEDGE

- preparing work for engineering finishes
- calculating process parameters
- determining current densities
- assessing material condition for suitability for plating
- selecting equipment, masking, materials
- correctly sizing positioning and securing anodes
- sizing, positioning and securing shields and robbers
- carrying out mechanical/chemical pre-treatment
- setting times voltages/currents and temperature
- monitoring and controlling operating conditions and processes for engineering coatings
- maintaining solutions for engineering finishes

Required knowledge

Look for evidence that confirms knowledge of:

- effects of plating process on different materials
- conditions affecting engineering finishes
- base metal types
- surface finish of untreated material
- mechanical/chemical and specialised 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
- current-capacity of conforming/auxiliary anodes
- the role, construction, properties, applications, and positioning of shields and robbers
- finish requirements, permissible tolerances
- the causes of abnormalities and their related corrective actions
- purpose and application of simple tests including pH, titration, density
- calculations related to additions/adjustments to solution and of product surface area
- safe work practices and procedures, including handling chemicals

Evidence Guide

EVIDENCE GUIDE

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.

Overview of assessment

A person who demonstrates competency in this unit must be able to apply electroplate engineering coatings. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

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.

Context of and specific resources for 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.

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication materials handling, recording and reporting associated with applying electroplate engineering coatings 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.

EVIDENCE GUIDE**Guidance information for assessment****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.

Treatment processes	Electroplating, electroforming, electroless plating
Operating/process parameters	Treatment times and currents, bath pH temperatures and densities, anode conditions, addition agent content, cleanliness of contacts etc., make-up, maintenance of solution levels and purity
Coating	Hard chroming, heavy nickel, electroless nickel, nickel composites, heavy deposits of nickel, copper, bronze up to 10 mm
Equipment	Wire racks, handling equipment, barrels, jigs, shields, robbers, etc.
Products	Base materials such as cast iron, brass, steels with machine welded sections, etc.
Masking materials	Wax, lacquers, tapes, foils
Anodes	Soluble, insoluble auxiliary anodes, etc.
Solution compositions	Cleaning, pickling, electroplating, chromate, acid dips
Checks	Density, titration, pH
Adjustment	Strength of solutions, temperature range

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing
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