



Australian Government

Department of Education, Employment and Workplace Relations

MEM08019B Electroplate protective finishes

Release: 1

MEM08019B Electroplate protective finishes

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers applying protective finishes to a range of ferrous and non-ferrous materials.
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Application of the Unit

Application of the unit	This unit applies to pre-treatment and application of protective finishes to a range of ferrous and non-ferrous materials using electroplating. Use of plating techniques, solutions and compositions for protective finishes, recognition and assessment of impurities and imperfections and associated corrective actions are integral to all applications. This unit applies to electroplating decorative finishes to household fittings, hardware, artefacts and accessories. Processing may apply to manual, semi or fully automatic still or barrel plating environments and may include volume production and 'one-off' components. Use of plating techniques, solutions and compositions for protective finishes, recognition and assessment of impurities and imperfections and associated corrective actions are integral to all applications. 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. Where dogging/lifting is undertaken, the appropriate materials handling units should be selected. For construction of anodes, shields/robbars etc., the
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	appropriate fabrication 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 protective finishes	1.1. Treatment processes are selected appropriate to the work requirements. 1.2. Process parameters are selected to achieve required finish. 1.3. Appropriate equipment is selected to achieve specified finish.
2. Monitor and control protective finish processes and operating conditions	2.1. Operating/process parameters are set to produce required protective finish/specifications. 2.2. Surface condition of finished components is monitored and confirmed and abnormalities are identified. 2.3. Corrective actions are taken to rectify non-conforming conditions. 2.4. Pre-treatment processes are carried out, where applicable.
3. Maintain solutions for protective finishes	3.1. Solution compositions are checked and confirmed to specification/operating range. 3.2. Adjustment requirements/additions are identified. 3.3. Additions are made to adjust solution composition to correct operating range. 3.4. Purification procedures are carried out as necessary. 3.5. Anodes are maintained to ensure correct operation.
4. Maintain equipment for protective finishes	4.1. Performance of ancillary equipment is checked and remedial actions are taken as necessary. 4.2. Electrical contacts are maintained. 4.3. Process transfer equipment is maintained.

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:

REQUIRED SKILLS AND KNOWLEDGE

- monitoring and maintaining:
 - conformance to thickness specifications
 - anode/cathode ratio
 - impurities/contamination
 - performance of various ancillary equipment
 - condition of electrical contacts
 - condition of racks, jigs and barrels
 - condition of rack coating
 - cathode contacts
- assessing material condition for suitability for plating
- calculating/measuring:
 - current and processing time
 - concentration and pH of solutions
 - required chemical/solution additions
- making selections of:
 - correct treatment processes
 - correct process parameters
 - correct equipment
- taking corrective action
- adjusting solutions/times/reprocessing or additional processing
- carrying out appropriate mechanical/chemical pre-treatment
- reading and interpreting routine information on written job instructions, specifications and standard operating procedures. May include drawings
- following oral instructions
- performing calculations using formulae

Required knowledge

Look for evidence that confirms knowledge of:

- effects of plating process on different materials
- basic principles of chemistry, electro chemistry and metallurgy related to the process including:
 - importance of maintaining satisfactory electrical contact
 - methods for detecting unsatisfactory contact
 - effects of build-up on cathode contacts
 - properties of different base materials
 - different pre-treatment processes and their application
 - process parameters and their relation to each other
 - differences between chromate conversion coatings
- types of defects, their causes and related corrective actions

REQUIRED SKILLS AND KNOWLEDGE

- mechanical/chemical pre-treatment processes
- the purpose and application of simple tests including pH and concentration
- operating parameters of solutions including temperature, agitation rate and similar parameters
- acceptable appearances for each stage of operation and common abnormalities
- application of different equipment to the type of work processed and correct operation and cleaning requirements (e.g. of cleaning filters)
- solutions, solution compositions and operating ranges for processes relative to protective finishes, including cleaning/pre-treatment, electroplating and post treatment
- procedures for testing plate thickness
- safe working procedures for handling chemicals relative to protective finishes and for safely adding to baths
- procedures for measuring out materials eg use of scales, volumetric measurement devices
- level of impurities and permissible limits, effects of impurities and purification procedures for protective finish solutions
- different anode arrangements including use of baskets and bags, conforming anodes
- correct operation of anodes and appropriate remedial action
- effect of maintenance schedules on plant performance and performance requirements and basic maintenance checks for rectifier, bus bars, agitation, heating/cooling, extraction and tank linings etc.
- use and application of personal protective equipment
- relevant hazards and control measures related to the competency

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 electroplate protective finishes. 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 electroplating protective finishes 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	Zinc, zinc alloys and tin
Process parameters	Dwell time, current density, current temperature
Equipment	Wire racks, handling equipment, barrels, jigs, shields, robbers, etc.
Operating process parameters	Calculation and setting of treatment times and currents, bath pH, temperatures and densities, solution levels and compositions, purification procedures
Maintain solutions	Typical tests for pH and concentration, calculation of adjustments to relevant solutions
Adjustment	Strength of solutions, temperature range
Anodes	Soluble, insoluble auxiliary anodes, etc.
Maintain equipment	Anode condition, electrical contacts etc.

Unit Sector(s)**Unit sector**

Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing
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