



Australian Government

Department of Education, Employment and Workplace Relations

MSATCM514A Select surface treatment methods for metallic components or products

Revision Number: 1

MSATCM514A Select surface treatment methods for metallic components or products

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor	This unit covers selecting common surface treatment processes for metals and alloys for specific applications
------------------------	---

Application of the Unit

Application of the unit	This unit applies to metallurgical activities in manufacturing and engineering environments. Work is carried out under supervision.
--------------------------------	--

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite Units		

Employability Skills Information

Employability Skills	This unit contains employability skills.
-----------------------------	--

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify <i>surface treatment methods</i> by their principal properties	1.1. The principal properties of different surface treatments for metals and alloys are identified. 1.2. The process route for each surface treatment is identified 1.3. The advantages and disadvantages of using different methods are identified. 1.4. The effects of different types of bonding in materials are identified. 1.5. The effects of mechanical and thermal processes on the principal properties of materials are identified.
2. Select surface treatment methods for specific applications	2.1. The surface treatment requirement for the specific application is determined. 2.2. Surface treatment method is selected based on the requirement and consideration of principal properties. 2.3. Selection is confirmed according to standard operating procedures.
3. Verify selected surface treatment methods as fit for purpose	3.1. Appropriate tests for the required properties are identified. 3.2. Testing of coatings is arranged with appropriate persons, if necessary. 3.3. Test results are analysed and material choices are confirmed or modified as appropriate.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

- undertake research
- select surface treatment process and materials to match application outcome
- carry out tests appropriate to the metal or alloy and surface treatment material
- read, interpret and follow information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents

Required knowledge:

Competency includes sufficient knowledge of:

- surface treatment methods and principles as specified in the range statement
- limitations of selected surface treatment processes

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, the 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 select surface treatment methods for metallic components or products. Critical aspects for assessment and evidence are required to demonstrate competency in this unit.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that competence is demonstrated in the ability to: • identify properties of surface to be treated or protected • select appropriate surface treatment process for surface and protection need • specify and evaluate tests of surface treated metals and alloys
Relationship to other units	This unit may be assessed concurrently with other relevant units.
Assessment method and context	Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the elements, performance criteria, skills and knowledge. A holistic approach should be taken to the assessment. Assessors should gather sufficient, fair, valid, reliable, authentic and current evidence from a range of sources. Sources of evidence may include direct observation, reports from supervisors, peers and colleagues, project work, samples, organisation records and questioning. Assessment should not require language, literacy or numeracy skills beyond those required for the unit. The assessee will have access to all techniques, procedures, information, resources and aids which would normally be available in the workplace. The method of assessment should be discussed and agreed with the assessee prior to the commencement of assessment.
Resource implications	This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

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.

Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used.
Surface preparation methods include	• descaling • mechanical finishing • solvent cleaning • alkaline cleaning • measurement of surface cleanliness
Theory of electroplating includes:	• electrical circuits • current density, limiting of current density • Faraday's laws • electrolytic conductivity • polarisation • standard electrode potential • co-deposition of hydrogen • codeposition of metals • throwing power • levelling and brightening • distribution of deposits • anodes • the hull cell as the major quality control in electroplating • current density • ph • evaluation of electroplating • testing of thickness of deposit and adhesion • to understand the various methods of thickness and adhesive tests and their effectiveness. • evaluation of the characteristics of copper nickel and chromium plating • operational contrast • solution concentration • bath analysis • temperature

RANGE STATEMENT	
	• conditions for bright plating • effect of impurities • anodising aluminium • the principles of anodising, colouring, sealing, and testing of anodised coatings. • methods of applying zinc • hot dip galvanising • continuous electrolytic tin plating • evaluation of continuous plating • comparison of zinc coating methods • metal spraying • sheradizing • zinc rich paints • practices in particular the halogen tin plating bath • vitreous enamelling
Surface treatment requirement	Surface treatment requirements may be for: • engineering • corrosion resistance • conductivity • aesthetics • other reasons Surface treatment requirements may be determined alone by a metallurgist or in conjunction with other experts and clients.
Appropriate tests	Tests which can be undertaken by a technician within the organisation as well as those required to be undertaken by external organisations, including simple tests.
Appropriate persons	Internal technicians and/or external organisations

Unit Sector(s)

Unit Sector	Metallurgy
--------------------	------------

Competency field

Competency Field	
------------------	--

Co-requisite units

Co-requisite Units		