



Australian Government

Department of Education, Employment and Workplace Relations

MSATCM502A Identify and describe equipment for mineral and chemical processing plants

Release: 1

MSATCM502A Identify and describe equipment for mineral and chemical processing plants

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor	This unit covers applying scientific principles and techniques to identify and describe processing equipment in mineral and chemical processing plants from a metallurgical perspective.
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Application of the Unit

Application of the unit	This unit requires application of scientific principles and techniques as a member of a design and development team or similar in support of specifying basic mineral extraction processes associated with metals production.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite Units	<i>MSATCM304A</i>	<i>Interpret basic binary phase diagrams</i>
	<i>MSATCM406A</i>	<i>Apply basic chemistry principles</i>

Employability Skills Information

Employability Skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Research and identify the range of scientific principles and techniques relevant to mineral and chemical processing plants.	1.1. The scientific principles relating to mineral and chemical processing are researched and reported on from appropriate sources of information and examination of applications. 1.2. The techniques and associated technologies, software and hardware required to implement scientific principles relating to mineral and chemical processing plants are identified.
2. Select scientific principles and techniques relevant to <i>equipment in mineral and chemical processing plants</i>	2.1. Scientific techniques and principles relevant to particular mineral and chemical processing situations are selected. 2.2. Relevant techniques and associated technologies, including software and hardware, are selected for particular mineral and chemical processing situations.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- select appropriate scientific principles to suit specific mineral processing and metals production applications
- apply scientific principles to particular processing situations
- refer solutions to the original aim of the application.
- quote solutions in appropriate units, using appropriate significant figures.
- quote limitations of solutions, due to assumptions, scientific principles and techniques used
- present solutions referring to the original aim of the application

Required knowledge:

Competency includes sufficient knowledge of:

- basic scientific principles (as given in the range statement) including:
 - limitations of selected scientific principles
 - basic mineral and chemical processing techniques and technologies, including software and hardware associated with implementing scientific principles in mineral and chemical processing situations related to metals production

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 apply basic scientific principles and techniques in describing equipment for mineral and chemical processing.

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 appropriate techniques and equipment used for mineral and chemical processing
- function of each type of equipment
- steps in the processing of particular minerals and chemicals including flow diagrams
- identify relationship of the processing of particular minerals and chemicals to metals production

Relationship to other units

This unit may be assessed concurrently with *MCMPM518A Specify basic metal extraction processes from minerals*

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. Assessment will need to occur in a situation where mechanical testing is undertaken.

Resource implications

This section should be read in conjunction with the range of variables for this unit of competency. Resources required may 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.

Sources of information may include:

- reference texts,
- manufacturer's catalogues
- industrial and professional magazines and journals,
- colleagues
- websites,
- phone, email and fax information gathering
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Equipment in mineral and chemical processing plants can include equipment for:

- Transport and storage of materials
- Heat transfer
- Solids drying
- Phase dispersion and separation
- Gas solid operations
- Liquid liquid operations
- Liquid solid operations
- Solid solid operations
- Size reduction and size enlargement
- Bulk solid handling
- Packaging of solids and liquids
- Chemical reactors
- Waste management
- Process safety
- Energy generation and utilisation
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Scientific techniques and principles include:

- Principles of mineral processing
- Principles of chemical processing
- Function of each type of equipment
- Flow diagrams
- Processes for particle size change
- Processes for separation of materials
- Processes for mixing of materials
- Processes for chemical change
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Unit Sector(s)

Unit Sector	Metallurgy
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Competency field

Competency Field	
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Co-requisite units

Co-requisite Units		