



Australian Government

MEM48027 Select non-metallic materials for engineering applications

Release: 1

MEM48027 Select non-metallic materials for engineering applications

Modification History

Release 1. Supersedes and is equivalent to MSATCM516A Select non-metallic materials for engineering applications.

Application

This unit of competency defines the skills and knowledge required to recognise common non-metallic materials used in engineering, assist in the selection of a material for a specific application, and use test results to evaluate the properties of materials.

It applies to metallurgist technician level activities in manufacturing and engineering environments where the metallurgist.

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

Pre-requisite Unit

Nil

Competency Field

Metallurgy

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
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 work information
2. Select non-metallic materials for specific applications	2.1 Determine the engineering requirement for the specific application in consultation with others 2.2 Select material based on the requirement and consideration of

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	principal properties and further processing 2.3 Confirm selection according to standard operating procedures (SOPs)
3. Verify selected non-metallic material as fit for purpose	3.1 Identify appropriate tests for the required properties 3.2 Arrange testing of materials with internal or external parties based on testing requirements 3.3 Analyse test results and confirm or modify material choices based on test outcomes

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

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

There is no Range of Conditions for this unit of competency.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MSATCM516A Select non metallic materials for engineering applications.

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 MEM48027 Select non-metallic materials for engineering applications

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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 and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications, charts, lists, drawings and other applicable reference documents in selecting non-metallic materials for engineering applications
- researching common engineering non-metallic materials by their required properties specific for the application on at least two occasions
- selecting or carrying out tests appropriate to the material
- arranging tests appropriate to the non-metallic material and analysing the results on at least two occasions
- verifying selection of materials.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

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)
- principles involved in selecting non-metallic materials
- common engineering non-metallic materials and properties including:
 - structure of materials
 - general non-crystalline features and short-range order
 - polymers and plastics
 - plastics and polymers processing and use
 - ceramic materials
 - manufacture of ceramic articles
 - glass
 - fibres
 - composite materials
 - adhesives

- typical properties to be tested including:
 - tensile strength
 - compression
 - shear characteristics
 - torsion
 - hardness
 - impact resistance
 - fatigue resistance
 - creep resistance
 - visual appearance and colour
 - magnetic properties
 - corrosion resistance
- compromises made to accommodate cost against properties.
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Assessment Conditions

- Assessors must:
 - have vocational competency in selecting non-metallic materials for engineering applications 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 that 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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