



Australian Government

PMBTECH505 Choose polymer materials for an application

Release: 1

PMBTECH505 Choose polymer materials for an application

Modification History

Release 1. Supersedes and is equivalent to PMBTECH505B Choose polymer materials for an application

Application

This unit of competency covers the skills and knowledge required to choose polymer materials for an application as may be required for a new product or advanced process/product problem solving.

This unit of competency applies to senior technicians or those in similar roles who are required to apply in-depth knowledge of materials, process, equipment and problem solving in order to identify polymer structures and properties; determine possible modifications to polymer properties; select tests and interpret results; and select the materials for an application.

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

Pre-requisite Unit

PMBTECH401 Predict polymer properties and characteristics

Competency Field

Technical

Unit Sector

Not applicable

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1	Determine possible polymer properties based on polymer type	1.1	Estimate molecular weight distribution changes with polymerisation mechanisms and conditions
		1.2	Predict the impact of monomer and polymer structure on polymer properties
2	Estimate polymer properties based on polymer structure	2.1	Predict property changes caused by polarity and intermolecular forces
		2.2	Determine possible polymer properties based on chain flexibility variations caused by changes in regularity, tacticity and intermolecular forces
		2.3	Estimate polymer properties based on molecular weight/molecular weight distribution, degree of cross-linking
		2.4	Predict barrier properties based on molecular orientation and degree of crystallisation
3	Choose a polymer compound for an application	3.1	Select appropriate base polymer/polymers for an application based on the polymer properties
		3.2	Determine reinforcements/additives required to meet product specification
		3.3	Predict failure mechanism for selected compound and modify selection if appropriate
		3.4	Determine the need for polymer compatibilisers and specify appropriate use if required
		3.5	Develop formulation and select appropriate production
4	Organise testing of polymer and interpret test results	4.1	Select appropriate test(s) for compounded polymer based on test purpose and limitations and material being tested
		4.2	Test colour using colour coordinates as required

- 4.3 Interpret test results and modify formulation/production method as required to meet product specification

Foundation Skills

This section describes those required skills (language, literacy and numeracy) 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.

Regulatory framework The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used.

Applicable legislation, regulations, standards and codes of practice include:

- health, safety and environmental (HSE) legislation, regulations and codes of practice relevant to the workplace, materials and processes being used and products being made
- Australian/international standards relevant to the materials being used and products being made
- any relevant licence and certification requirements.

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state/territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and such requirements the legislative requirements take precedence.

Procedures All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, and include one or any combination of:

- test procedures
- technical specifications
- technical drawings
- emergency procedures
- work instructions
- standard operating procedures (SOPs)
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant.

Unit Mapping Information

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Links

MSA Training Package Implementation Guides - <http://mskills.org.au/training-packages/info/>