



Australian Government

PMAOPS751 Apply physiochemical knowledge to select raw materials for surface coatings

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to PMAOPS751A Apply physiochemical knowledge to select raw materials for surface coatings

Application

This unit of competency covers the skills and knowledge required to select raw materials for surface coatings. A surface coating is any liquid (e.g. solvent or emulsion-based) material applied to a solid surface for decorative and/or protective reasons.

This unit of competency applies to senior technicians, laboratory supervisors, research and development personnel, or those in similar roles who are required to apply in-depth physiochemical knowledge in order to evaluate and select coating components (resins, additives and pigments), and design solvent systems to meet surface coatings requirements/specifications.

This unit provides the underlying competency to select materials which may then be combined to make a decorative or non-decorative coating.

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

Pre-requisite Unit

Nil

Competency Field

Operations

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

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

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|--|------------|--|
| 1 Apply knowledge of polymers to surface coating properties | 1.1 | Predict coating properties related to nature of polymer base |
| | 1.2 | Calculate the molecular weight of a polymer |
| | 1.3 | Distinguish between the characteristics of solution, |

		emulsion and dispersion polymers
	1.4	Identify health, safety and environment (HSE), economic and manufacturing-related properties of polymers
	1.5	Identify the effects of monomer selection on product properties
2	Select resins for surface coatings	2.1 Distinguish between the characteristics and uses of surface coating resins
	2.2	Identify HSE, economic and manufacturing-related properties of resins
	2.3	Select a resin for a typical end use
3	Select additives for surface coatings	3.1 Identify the principal additives used in coatings
	3.2	Distinguish between the characteristics and uses additives
	3.3	Identify HSE, economic and manufacturing-related properties of additives
	3.4	Select an additive for a typical end use
4	Design a solvent system for surface coatings	4.1 Identify the role and behaviour of solvent types and their properties
	4.2	Select solvents which may be suitable for an application
	4.3	Identify HSE, economic and manufacturing-related properties of solvents/solvent systems
	4.4	Recommend a solvent system by applying solvent system design principles and solubility parameters
5	Select pigments for a surface coating	5.1 Balance the relationship between particle size, gloss and opacity to achieve required outcome
	5.2	Distinguish between organic and inorganic pigment

- 5.3 Identify applications for titanium dioxide (TiO₂) pigments
- 5.4 Evaluate the need for the use of anti corrosive pigments
- 5.5 Verify the need for extenders
- 5.6 Identify HSE, economic and manufacturing-related properties of pigments
- 5.7 Select a pigment combination for a typical application

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.

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, and include one or more of the following:

- legislative requirements, including work health and safety (WHS)
- industry codes of practice and guidelines
- environmental regulations and guidelines
- Australian and other standards
- licence and certification requirements

All operations to which this unit applies are subject to stringent health, safety and environment (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 HSE requirements, the HSE requirements take precedence.

Hazards Hazards include one or more of the following:

- flammability and explosivity
- hazardous products and materials
- other hazards that might arise

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

Procedures are written, verbal, visual, computer-based or in some other form, include one or more of the following:

- work instructions
- standard operating procedures (SOPs)
- 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

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=9fc2cf53-e570-4e9f-ad6a-b228ffdb6875>