



Australian Government

PMAOPS753 Develop a non-decorative coating or ink

Release: 1

PMAOPS753 Develop a non-decorative coating or ink

Modification History

Release 1. Supersedes and is equivalent to PMAOPS753A Develop a non-decorative coating or ink

Application

This unit of competency covers the skills and knowledge required to develop a new non-decorative coating product. A surface coating is any liquid (e.g. solvent or emulsion-based) material applied to a solid surface for decorative and/or protective reasons. A non-decorative coating may also have a decorative function, but its main function is protective.

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 develop non-decorative coating formulations to meet formulation parameters/specifications, specify quality control and performance tests, solve problems, and recommend manufacturing and application methods.

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.

1	Formulate a non-decorative coating	1.1	Confirm the specification/performance requirements of the non-decorative coating
		1.2	Determine the effect on performance characteristics of formulation parameters
		1.3	Specify required quality control and performance tests

		1.4	Recommend appropriate raw materials
		1.5	Recommend appropriate raw material suppliers
		1.6	Formulate an industrial coating/ink to specified parameters
		1.7	Ensure laboratory formulations are converted to production scale
2	Specify the relationship of pigment/binder for a coating	2.1	Define pigment/binder relationships and their impact on coating properties
		2.2	Calculate pigment/binder ratio, and pigment volume concentration (PVC)
		2.3	Specify pigment/binder relationships appropriate for a coating
3	Recommend a method of manufacture	3.1	Identify critical formulation parameters and the effect on manufacturing characteristics for industrial coatings/inks
		3.2	Determine dispersion, let down and mixing required
		3.3	Select the types of equipment required for coating manufacture
		3.4	Recommend a method of manufacture
4	Identify and control hazards	4.1	Identify material hazards
		4.2	Identify regulatory requirements
		4.3	Identify other hazards from the manufacture of non-decorative coatings/inks
		4.4	Recommend appropriate hazard control
5	Recommend a coating application method	5.1	Distinguish between common non-decorative coating/ink application methods
		5.2	Recommend an application method for non-decorative

coatings/ink

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:

- equipment failures
- industrial (machinery, equipment and product)
- noise, rotational equipment or vibration
- plant services (steam, condensate and cooling water)
- flammability and explosivity
- hazardous products and materials
- slippery surfaces, spills or leaks
- 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:

- 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

Release 1. Supersedes and is equivalent to PMAOPS753A Develop a non-decorative coating or ink

Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for PMAOPS753 Develop a non-decorative coating or ink

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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 the ability to:

- evaluate raw materials against specifications, including:
 - chemistry
 - structure
 - physical and chemical properties relevant to surface coating
 - modification reactions as relevant (e.g. alkyds)
 - hazards
 - impact on environment
 - pigment/binder relationship
- determine the impact of key variables on formulation and manufacture, including:
 - substrates
 - physical properties
 - cost of raw materials
 - application methods
 - curing conditions
 - drying times
 - pigment/binder relationship
- select materials for purpose
- calculate formulations to customer's requirements
- isolate the causes of problems and to be able to distinguish between causes of problems, such as:
 - incorrect equipment
 - incorrect raw materials
 - inadequate ventilation when manufacturing
 - inability to meet customer specifications
 - inadequate quality control tests
- recommend appropriate manufacturing procedure
- recommend appropriate application method (brush, roller or spray, dipping, curtain coating, print roll or ink jet/bubble)
- complete written/electronic records

- communicate effectively with internal and external stakeholders.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- types and impact of pigment binder relationships, including:
 - specific gravity
 - weight and volume solids
 - pigment/binder ratio
 - pigment volume concentration (PVC)
- formulation parameters
- automotive paints requirements
- inks formulation
- powder and marine coating formulation
- flow point curves
- safety data sheets (SDS)
- toxicity and other hazards of raw materials
- types of raw materials and their chemical properties and functions
- impact of differing raw material suppliers
- principles of dispersion, let down and mixing
- types and application of equipment used for coating manufacture
- quality control methods
- test methods
- organisation procedures
- duty of care obligations
- hierarchy of control
- hazards that may arise in the job/work environment, and:
 - their possible causes
 - potential consequences
 - appropriate risk controls.

Assessment Conditions

- The unit should be assessed holistically and the judgement of competence based on a holistic assessment of the evidence.
- The collection of performance evidence is best done from a report and/or folio of evidence drawn from:
 - a single project which provides sufficient evidence of the requirements of all the elements and performance criteria
 - multiple smaller projects which together provide sufficient evidence of the requirements of all the elements and performance criteria.

- A third-party report, or similar, may be needed to testify to the work done by the individual, particularly when the project has been done as part of a project team.
- Assessment should use a real project in an operational workplace. Where this is not possible or practical assessment must occur using a sufficiently rigorous simulated environment reflecting realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process, such as workbooks, written assessments or interviews (provided a record is kept).
- 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.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications associated with this unit.
- The regulatory framework will be reflected in workplace policies and procedures and is not required to be independently assessed.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- In addition, the assessor or anyone acting in subject matter expert role in assessment must demonstrate both technical competency and currency. If the assessor cannot demonstrate technical competency and currency they must assess with a subject matter expert who does meet these requirements.
- Technical competence can be demonstrated through one or more of:
 - relevant VET or other qualification/Statement of Attainment
 - appropriate workplace experience undertaking the type of work being assessed under routine and non-routine conditions
 - appropriate workplace experience supervising/evaluating the type of work being assessed under routine and non-routine conditions
- Currency can be demonstrated through one or more of:
 - being currently employed undertaking the type of work being assessed
 - being employed by the organisation undertaking the type of work being assessed and having maintained currency in accordance with that organisation's policies and procedures
 - having consulted/had contact with an organisation undertaking the type of work being assessed within the last twelve months, the consultation/contact being related to assessment
 - conducting on-the-job training/assessments of the type of work being assessed
 - being an active member of a relevant professional body and participating in activities relevant to the assessment of this type of work

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