



Australian Government

PMAOPS550 Develop a colour formulation

Release: 1

PMAOPS550 Develop a colour formulation

Modification History

Release 1. Supersedes and is equivalent to PMAOPS550B Develop a colour formulation

Application

This unit of competency covers the skills and knowledge required to develop a new colour formulation from scratch to match a provided colour sample or description of customer requirements. It applies to new colour formulations for existing and/or new products and the use of computer and visual colour matching. The formulation would normally use colourants already available within the company (preferred colourants), but does not preclude the use of colourants which are novel/new to the company.

This unit of competency applies to any industry sector requiring the development of a new colour formulation for its products. Examples of products include:

- paint
- ink
- plastics
- rubber
- concrete products
- glass products
- clay/ceramic products.

This unit of competency applies to technologists or those in similar roles who are required to confirm design specifications, identify and resolve potential manufacturing problems, undertake and analyse production trials, and make modifications to achieve suitable formulation and production process.

This unit of competency applies to an individual who is part of a team for the total development of a new product, but may develop the colour formulation for a new colour for an existing product independently. The technologist would liaise with relevant production and other personnel for production trials.

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

Pre-requisite Unit

PMAOPS350 Match and adjust colour

PMAOPS450 Solve colour problems

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	Confirm design brief of new colour	1.1	Communicate with customer and other key stakeholders and agree on design specifications
		1.2	Determine end use of product (e.g. interior, exterior, automotive, industrial or decorative)
		1.3	Develop and validate design brief to meet needs
2	Determine initial colour formulation	2.1	Analyse colour sample (where provided) using colour computer and/or eye and predict possible colour formulation
		2.2	Compare predicted formulation with company/customer preferred colourants
		2.3	Adjust predicted formulation to use preferred colourants
		2.4	Check that the adjusted formulation complies with design brief
3	Conduct small scale trials	3.1	Make/arrange for small batch to adjusted formulation
		3.2	Undertake trials to determine optimum processing conditions, where relevant
		3.3	Analyse colour of sample product, compare to design brief and determine variation to desired colour
		3.4	Modify formulation and processing, where relevant, to have simplicity of manufacture and to meet brief
4	Assess hazards	4.1	Identify hazards arising from colour formulation and

		processing
	4.2	Assess risks arising from those hazards
	4.3	Determine action to control risks in accordance with hierarchy of control and duty of care
	4.4	Take required action before proceeding to trial
5	Trial new colour formulation through the process	5.1 Design trial to procedure to deliver required information 5.2 Ensure work health and safety (WHS) and environmental requirements are stringently observed 5.3 Coordinate the trialling of the new product 5.4 Interpret colour trial results, determine variation to desired colour and guide colour trial process 5.5 Adjust formulation, and if appropriate tune process, to optimise production of new colour
6	Coordinate evaluation and testing	6.1 Determine colour testing and evaluation regime required to meet end use requirements, including regulatory/industry code requirements 6.2 Arrange for testing and evaluation of trial colour 6.3 Interpret colour trial results and determine variation to desired colour 6.4 Modify formulation and conduct new trials as required 6.5 Determine final formulation and processing specifications
7	Implement procedures for new colour	7.1 Monitor initial production and adjust process, conditions and formulation to make the process a smooth operation 7.2 Ensure process specifications reflect the optimised operation developed 7.3 Ensure quality standards and procedures meet requirements of design brief

- 7.4 Ensure procedures are correct for the new colour
- 7.5 Ensure project records are complete and all required reports have been completed and submitted
- 7.6 Archive records according to procedure

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:

- toxicity
- dust or vapours
- flammability and explosivity
- hazardous products and materials

- other hazards identified on safety data sheets (SDS)

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

Design specifications Design specifications include the following:

- colour /colour specification
- surface finish/gloss
- viewing conditions (lighting)
- opacity
- requirements for metameric/non-metameric match
- other aesthetic requirements

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMAOPS550B Develop a colour formulation

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 PMAOPS550 Develop a colour formulation

Modification History

Release 1. Supersedes and is equivalent to PMAOPS550B Develop a colour formulation

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:

- communicate effectively with internal and external customers
- confirm end use of product and design specifications
- determine formulations and/or make adjustments to computer suggested formulation to meet specifications, company conditions and standard materials/colourants
- undertake production trials and analyse results
- isolate the causes of variation to desired colour and distinguish between causes of problems, such as:
 - wrong colourant
 - wrong colourant amount
 - wrong grind time/particle size
 - wrong wetting/dispersing
 - differing lighting conditions
 - variable surface finish/gloss level
 - non-metameric matching issues
 - process caused colour differences
- identify and resolve problems
- interpret weathering and other test data
- make both metameric and non-metameric matches
- determine the hazards arising from the colourants chosen.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- typical problems and possible solutions
- the 'flare path' on a tonal graph of tone vs time
- optimum grind/particle size for required colour
- balance gloss, opacity and tone
- interaction of colourants and impacts of processing variables on the final colour
- regulatory framework
- 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

Links

Companion Volume implementation guides are found in VETNet -

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