



Australian Government

Assessment Requirements for 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

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 resins, pigments and additives against specifications, including:
 - chemistry
 - structure
 - physical and chemical properties relevant to surface coating
 - modification reactions as relevant (e.g. alkyds)
 - impact on environment
 - benefits/costs
- select materials for purpose
- calculate the molecular weight of a polymer to determine the effects on the end product.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- characteristics and application of surface coating resins, including:
 - synthetic resins with drying oils
 - alkyd resins
 - modified alkyd resin
 - epoxy resins
 - saturated and unsaturated polyester resins
 - vinyl resin solutions
 - thermosetting acrylic resins
 - phenolic resins
- characteristics and application of additives, including:
 - cellulose
 - nitrocellulose
 - cellulose esters
 - cellulose ethers
- chemistry of raw materials

- safety data sheets (SDS)
- polymers used in surface coatings and their impact of the surface coating properties and applications
- importance and impact of polymer functional groups
- manufacturing techniques of alkyd resins
- the effects of additives on the final properties of surface coatings
- safety and environmental concerns in the use and handling of solvents
- glass transition temperature of polymers and film forming mechanisms
- the principles of emulsion polymerisation
- the role and behaviour of solvents
- the process of solvent evaporation used in formulating
- the functions of pigments
- reasons for the use of inorganic and organic pigments
- key differences between organic and inorganic pigments
- the performance properties of titanium dioxide (TiO₂) pigments
- the use of anti-corrosive pigments
- the role and properties of extenders
- overall, the reasons for the selection of raw materials when used in surface coatings
- 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

Links

Companion Volume implementation guides are found in VETNet -

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