



Australian Government

MSFFDM5012 Research, test and apply materials and technologies for design projects

Release: 1

MSFFDM5012 Research, test and apply materials and technologies for design projects

Modification History

Release 1. Unit code and title changed. Application changed. Elements and Performance Criteria changed. Range of Conditions removed and relevant information moved to Assessment Requirements. Assessment Requirements changed. Supersedes and is not equivalent to MSFFDT5008 Research and recommend alternative manufacturing processes and MSFFDT5009 Research and recommend machine technology.

Application

This unit describes the skills and knowledge required to research different complex materials and technologies and their applications. It also covers how to use this information to inform design briefs, select materials and technologies that interact harmoniously together, and establish testing requirements for final selection.

This unit applies to individuals working in a manufacturing or design studio environment who analyse and compare information and test results to develop a combined materials and technologies production solution, either alone or as part of an internal or external team.

No licensing or certification requirements exist at the time of publication. Relevant legislation, industry standards and codes of practice within Australia must be applied.

Competency Field

Furniture design and manufacturing – general

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Determine project requirements	1.1 Review and clarify project brief with client 1.2 Confirm and evaluate parameters and constraints from project brief 1.3 Identify and assess aspects of brief that are impacted by materials and technologies selection 1.4 Identify key project stakeholders and establish required communication protocols
2. Research materials and technologies for testing	2.1 Evaluate features of briefed product and research how materials and technologies have been used to achieve these in other projects 2.2 Investigate physical properties, capabilities, limitations or

	constraints of different materials and how these could be utilised in projects 2.3 Research aesthetic properties of different materials in terms of suitability for testing 2.4 Identify production methods, including safety issues and specialised equipment and personnel, required to work with different materials, and assess suitability of those methods against project brief 2.5 Identify and consider new and emerging technologies against project brief and proposed production methods 2.6 Evaluate materials and technologies in context of sustainability, cost and availability for testing and production 2.7 Select materials and technologies to be tested based on outcomes of research
3. Test materials and technologies	3.1 Develop test program and reporting methods for materials and technologies that addresses all facets identified, including interaction of materials and technologies 3.2 Ensure test program addresses safety considerations, both specific to use of selected materials and technologies, and generally for workplace 3.3 Validate test program with relevant personnel or key stakeholders 3.4 Organise physical, financial and human resources based on scope and nature of testing program 3.5 Follow test program to test materials and technologies 3.6 Report on test program results in accordance with agreed reporting methods
4. Analyse and report on test results	4.1 Interpret test program results and their implications from report 4.2 Evaluate advantages and disadvantages of tested materials and technologies based on test results and against project requirements 4.3 Assess production methods and expertise requirements from test results 4.4 Recommend and validate materials, production methods including equipment and technologies, and expertise with key stakeholders 4.5 Complete workplace documentation to finalise project brief, highlighting research and test results, and rationale for materials chosen

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit to performance criteria.

- Numeracy skills to interpret technical information and understand technology operations.
- Reading skills to interpret project brief and research information.
- Writing and oral communication skills to document and communicate research results.

Other foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Unit Mapping Information

Release 1. Supersedes and is not equivalent to MSFFDT5008 Research and recommend alternative manufacturing processes and MSFFDT5009 Research and select manufacturing technologies.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=0601ab95-583a-4e93-b2d4-cfb27b03ed73>

Assessment Requirements for MSFFDM5012 Research, test and apply materials and technologies for design projects

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Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and demonstrated the ability to:

- research, test and apply materials and associated technologies for three different design briefs, and in doing so:
 - research five different types of materials and three different design- or production-related technologies
 - develop, implement and report on a test program for two different types of materials and two different design- or production-related technologies
- prepare and present three reports in appropriate formats to convey information to key stakeholders.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- elements and principles of design, their interrelationships and how they are used in materials selection
- characteristics, properties and selection criteria for different materials, both aesthetic and functional, including:
 - manmade and natural timbers (native and imported) including composites and finishes
 - plastics
 - metals
 - alloys
 - stone-based products
 - glass
 - textiles
 - fibreglass
 - foam
 - synthetics
 - cardboard and paper products

- any other manipulable substance
- particular features and behaviours of materials and the impact of these on production methods and technologies
- types and methods of testing specific to different materials, including strength and performance under different conditions
- design- and production-related technologies applicable to all stages of a project, and their impact on materials selection and output variables
- key features, costs, efficiencies and technical application of current and emerging technologies, including:
 - CNC operations
 - 3D printing
 - foundries and casting
 - robotics
 - laser cutting
 - water-jet cutting
- how to structure and present testing program results and recommendations
- the expertise and specialised equipment or technologies required for different materials, and the impact of these on project constraints including timeframes and budgets
- non-traditional materials that complement or enhance the overall design.

Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - design briefs
 - range of complex materials for testing
 - industry-standard technologies suitable for design and production
 - information technology for research and design presentation.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors

Links

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