



Australian Government

**Assessment Requirements for
MEAENG0003 Select and test aviation
engineering materials**

Release: 1

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Modification History

Release 1. New unit of competency. Supersedes and is not equivalent to MEA707 Select and test aeronautical engineering materials and MEA708 Select and test avionic engineering materials.

Performance Evidence

There must be evidence the candidate has completed all the tasks outlined in the elements and performance criteria of this unit, and demonstrated the ability to conduct at least two tests on two or more aeronautical engineering materials from the following material groups:

- non-ferrous metals and alloys
- ferrous metals
- non-metallic
- electrical insulation.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- regulatory bodies and industrial authorities, including:
 - Australian Standards (AS)
 - American Society of Testing and Materials (ASTM)
 - US Military Specification (MIL Spec.)
 - American Society of Manufacturing Engineers (ASME)
 - International Standards Organisation (ISO)
 - Civil Aviation Safety Authority (CASA)
 - Australian Defence Force (ADF)
 - United States Federal Aviation Authority
 - European Aviation Safety Agency
- codes, standards, legislation and regulations related to selection of materials and products for engineering applications, including environmental impact and sustainability assessment
- materials, components and products, including characteristics, faults and flaws
- classes of materials, including:
 - non-ferrous metals and alloys – copper, aluminium, zinc, lead, tin, titanium and their alloys
 - ferrous metals – carbon steels, alloy steels and cast irons
 - non-metallic – composite materials, bearing materials, lubricants, ceramics, polymers and fabrics, adhesives

- electrical insulation materials, thermal conductors and insulators, electrical conductors, semiconductors and insulators
- properties of materials, including:
 - strength
 - elasticity and plasticity
 - malleability
 - toughness and brittleness
 - fatigue endurance
 - mouldability, weldability, machinability and formability
 - resistance to creep and stress relaxation
 - resistance to degradation (e.g. use of plastic fillers to enhance UV resistance)
 - adhesion
 - electrical, magnetic, thermal, chemical and optical
 - material structure and effect on properties
 - flammability of fabrics
- effect of the following on engineering materials:
 - manufacturing and construction processes on material properties (e.g. effect of heat treatment on corrosion resistance and fatigue properties, hydrogen embrittlement, shot peening of surfaces)
 - material characteristics, faults and flaws on product and processes
 - corrosion and corrosion protection methods
 - aging of metals and fatigue
 - property enhancement on design (e.g. adhesives plus sintering replacing some forging and machining of gears on shafts)
 - lay-up methods for composite structures
 - costs, such as manufacture of material, source of material, and typical applications and possibilities
- organisational procedures, including:
 - calibration procedures
 - traceability requirements
 - reporting and record keeping
 - testing including typical applications for tests
 - material safety data sheets (MSDSs)
- test methods, standards and regulations for:
 - materials and components
 - faults and flaws in materials and components or product
- sources and uses of information on materials, materials tests, test certificates, regulations, standards, including:
 - reference texts
 - manufacturer's catalogues and industrial magazines
 - websites

- use of phone, email and fax information gathering
- methods of accessing and using alternative information sources
- identification of materials for an application based on comparison of properties of materials
- Australia's national measurement system and its role and governing bodies, including:
 - National Measurement Institute (NMI)
 - National Association of Testing Authorities
 - Standards Australia
 - Joint Accreditation System of Australia and New Zealand
- measurement standard requirements
- common production and construction methods and processes
- design functional requirements.

Assessment Conditions

The following conditions of assessment represent the requirements of the regulators (DASA and CASA) and maintenance stakeholders and must be rigorously observed.

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

- use of suitable facilities, equipment and resources, including workplace procedures, manufacturing specifications, codes, standards, manuals, and reference materials relevant to selecting and testing engineering materials.

Evidence of tasks demonstrating competency must be recorded in a log of industrial experience and achievement.

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

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>