Title	**Demonstrate knowledge of composite materials and components used in aircraft structure**		
Level	**3**	**Credits**	**6**

Purpose	This is an entry level skills unit standard for people entering the aeronautical engineering industry. People credited with this unit standard are able to demonstrate knowledge of: types of composite materials and their use in aircraft structures; inspection processes used to identify defects in composite material; composite component defects and their causes; handling procedures for composite materials; and manufacture and repair of composite components.

Classification	Aeronautical Engineering > Aeronautical Engineering - Core

Available grade	Achieved

Guidance Information

1 All tasks must be carried out in accordance with enterprise procedures.

2 Definition
Enterprise procedures – procedures used by the organisation carrying out the work and applicable to the tasks being carried out. Examples are – standard operating procedures, safety procedures, equipment operating procedures, codes of practice, quality management practices and standards, procedures to comply with legislative and local body requirements.

3 This unit standard is aligned with the Society of Automotive Engineers document AIR6825, Module 1 'Composites Awareness Curriculum'. This is available on the SAE website www.sae.org.

4 This unit standard may be assessed against either on or off job in a real or simulated aeronautical engineering environment.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of types of composite materials and their use in aircraft structures.

Performance criteria

1.1 Types of composite materials are described in terms of their features and use on aircraft.

Range may include but are not limited to – carbon/Nomex sandwich, carbon monolithic, Kevlar, Kevlar/Nomex honeycomb sandwich, composites using carbon pile stiffening, fibreglass monolithic, fibreglass/Nomex honeycomb sandwich, fillers, metal-to-metal bonding, metal-to-composite bonding fiberglass, poylurethane fillers.

1.2 Areas where composites are used on aircraft are identified.

Range may include but are not limited to – primary structures: fuselage, wings, bulkheads, propellers, flight controls;
secondary structures: cabin interior fittings, cowls, doors, empennage, brakes, floorboards, radomes, non-structural components/parts.

Outcome 2

Demonstrate knowledge of inspection processes used to identify defects in composite material.

Performance criteria

2.1 Inspection methods are described in terms of processes and procedures.

Range may include but are not limited to – visual, tap testing, x-ray, ultrasound, thermography.

Outcome 3

Demonstrate knowledge of composite component defects and their causes.

Performance criteria

3.1 Defects in composite aircraft components are described.

Range may include but are not limited to – cosmetic damage, cracks, fatigue, impact damage, erosion, corrosion of metal fittings and hardware, delamination, foreign matter.

3.2 Defects in composite components are described in terms of causes and effects.

Range may include but are not limited to – manufacturing processes, impact, curing, lightning strike, environmental attack, ground handling, dissimilar material contact, maintenance, foreign objects, chemical contamination.

Outcome 4

Demonstrate knowledge of handling procedures for composite materials.

Performance criteria

4.1 Storage of composite material is described.

Range may include but is not limited to – long-term storage, temperature, humidity, time and temperature sensitive materials.

4.2 Special handling requirements of composite material are described.

Range may include but are not limited to – protection of personal health from cutting/drilling/sanding products; marking, fumes, conductive dust and static discharge, overheated uncured materials.

Outcome 5

Demonstrate knowledge of manufacture and repair of composite components.

Performance criteria

5.1 Manufacture processes for composite components are described.

5.2 Typical repair processes for composite components are described.

Planned review date	31 December 2027

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 September 2013	31 December 2021
Review	2	26 March 2020	N/A
Rollover and Revision	3	26 April 2024	N/A

Consent and Moderation Requirements (CMR) reference	0028

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Ringa Hora Services Workforce Development Council qualifications@ringahora.nz if you wish to suggest changes to the content of this unit standard.