Title	**Operate a thermal chamber for aerospace testing**		
Level	**4**	**Credits**	**20**

Purpose	People credited with this unit standard are able to: prepare to test aerospace components in a thermal chamber; prepare for the collection of thermal data from a thermal chamber; test and collect environmental operating data from aerospace components; evaluate environmental operating data; and complete finishing activities relating to the operation of the thermal chamber for aerospace testing.

Classification	Aeronautical Engineering > Aerospace Engineering

Available grade	Achieved

Guidance Information

1 Definitions
Abnormal measurement – a departure in the frequency and/or amplitude characteristics from the normal fault characteristic.
DUT – device under test. The aerospace component being tested in the thermal chamber.
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.
Measuring equipment – a range of instruments that measure, display, and analyse the thermal profile and operation of the device under test. Technologies include thermal or thermal vacuum chambers, temperature controllers, data acquisition devices and vacuum sensors.
Thermal chamber – a test chamber that simulates a range of temperatures, allowing the user to test the environmental resistance of a device placed within. Variants include thermal vacuum chambers, which are also able to simulate a range of pressures in addition to temperature.

2 This unit standard can be assessed against using a stand-alone thermal instrument, or in conjunction with a data acquisition system.

3 Evidence of establishing thermal data should be collected on at least five different aerospace components, with at least fifty measurements taken.

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4 The following apply to all outcomes of this unit standard:
- a all activities are to be completed and reported in accordance with enterprise procedures;
- b all work practices must meet worksite's documented quality management requirements;
- c all activities must comply with policies, procedures and requirements of the enterprises involved; and any relevant legislative and/or regulatory requirements, which include, but are not limited to, the Health and Safety at Work Act 2015.

Outcomes and performance criteria

Outcome 1

Prepare to test aerospace components in a thermal chamber.

Performance criteria

1.1 Testing task is determined by reviewing enterprise procedures, operating documentation and manuals.

1.2 Aerospace component identity is confirmed with operating documentation by comparing serial and part numbers.

1.3 Work area is prepared, and resources are obtained and checked for serviceability.

Range may include but is not limited to – publications, tools, equipment, safety equipment, safety devices fitted, hazard symbols displayed, calibration records, environmental conditions established.

1.4 Support equipment is positioned.

Range may include but is not limited to – testing and measuring equipment, data acquisition devices and power supplies.

1.5 Aerospace components are prepared for testing in the thermal chamber.

Range may include but is not limited to – clean, inspect, install in chamber.

Outcome 2

Prepare for the collection of data from a thermal chamber.

Performance criteria

2.1 Test conditions and operational limits are identified, explained, and related to the thermal chamber with different environmental profiles.

Range includes but is not limited to – temperature, pressure, mechanical, electrical, fluids.

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2.2 Operational limitations applying to the DUT are identified.

2.3 Measuring equipment is selected in accordance with equipment operating instructions.

Outcome 3

Test and collect environmental operating data from aerospace components.

Performance criteria

3.1 Undertake test by operating the thermal chamber and DUT.

3.2 Environmental operating measurements are taken in accordance with database requirements.

Range may include but is not limited to – record data, determine adjustments, calibrate, functionally test.

3.3 Database is updated with the recorded data.

3.4 Abnormal measurements and defects found during testing are reported and recorded.

Range may include but is not limited to – out of limits performance parameters, leaks, departure in the operating characteristics from the normal fault characteristics.

3.5 Inspections are obtained.

3.6 Awareness of the actions to be taken in abnormal and emergency occurrences is demonstrated.

Range may include – fire suppression, emergency stops, power isolation.

Outcome 4

Evaluate environmental operating data.

Performance criteria

4.1 Thermal trends are determined from current and historical data.

4.2 Data is assessed against performance criteria.

Range may include but is not limited to – thermal environment test profile (cycles, ramp rates, dwell durations), and DUT performance characteristics (input power, operation, degradation) against pass/fail criteria.

4.3 Any data irregularities are explained, and action taken.

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Outcome 5

Complete finishing activities relating to the operation of a thermal chamber for aerospace testing.

Performance criteria

5.1 Tested aerospace components are prepared for use, storage, or transit.

Range may include but is not limited to – locking, inhibiting, blanking, removing from test chamber, preparing for transit.

5.2 Completion activities specific to the task and work area are carried out.

Range may include but is not limited to – tool control, cleanliness, tidiness, return of publications and equipment.

5.3 Resources are checked for serviceability and returned to service or storage.

Range may include but is not limited to – tools, equipment, safety equipment.

5.4 Leftover parts and materials are disposed of.

Range may include but is not limited to – serviceable, unserviceable, surplus, waste, scrap, hazardous.

5.5 Documentation is completed.

Range may include but is not limited to – work orders, job sheets, non-conformance reporting.

5.6 Work area is left in a state that enables the next task to begin.

Planned review date	31 December 2025

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	30 March 2023	N/A

Consent and Moderation Requirements (CMR) reference	0028

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

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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.

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