

<b>Title</b>	<b>Operate a vacuum chamber for aerospace testing</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>20</b>

<b>Purpose</b>	People credited with this unit standard are able to: prepare to test aerospace components in a vacuum chamber; prepare for the collection of data from a vacuum chamber; test and collect operating data from aerospace components; evaluate operating data; and complete finishing activities relating to the operation of the vacuum chamber for aerospace testing.
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<b>Classification</b>	Aeronautical Engineering > Aerospace Engineering
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<b>Available grade</b>	Achieved
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### 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 vacuum 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.

*Vacuum chamber* – a test chamber that simulates a range of pressures, allowing the user to test the environmental resistance of a device placed within.

*Vacuum measuring equipment* – a range of instruments that measure, display, and analyse the vacuum conditions including pressure sensors.

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

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

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.

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## Outcomes and performance criteria

### Outcome 1

Prepare to test aerospace components in a vacuum chamber.

#### Performance criteria

- 1.1 Testing task is determined by reviewing enterprise procedures, operating documentation and manuals.
- 1.2 Aerospace component's 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, 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 a vacuum chamber.
- Range may include but is not limited to – clean, inspect, install in vacuum chamber.

### Outcome 2

Prepare for the collection of data from a vacuum chamber.

#### Performance criteria

- 2.1 Test conditions and operational limits for the vacuum chamber are identified and explained.
- Range includes but is not limited to – pressure, mechanical, electrical, fluids.
- 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 operating data from aerospace components.

**Performance criteria**

- 3.1 Test is undertaken by operating the vacuum chamber and DUT.
- 3.2 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 actions to be taken in abnormal and emergency occurrences is demonstrated.
- Range may include fire suppression, emergency stops, power isolation.

**Outcome 4**

Evaluate operating data.

**Performance criteria**

- 4.1 Vacuum trends are determined from current and historical data.
- 4.2 Data is assessed against performance criteria.
- Range may include but is not limited to – 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.

**Outcome 5**

Complete finishing activities relating to the operation of the vacuum chamber for aerospace component 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 vacuum 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.

<b>Planned review date</b>	31 December 2025
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**Status information and last date for assessment for superseded versions**

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

<b>Consent and Moderation Requirements (CMR) reference</b>	0028
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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](mailto:qualifications@ringahora.nz) if you wish to suggest changes to the content of this unit standard.