

# Altitude research facility

●●● Enabling technology development at realistic flight conditions

With this unique and highly flexible facility, the National Research Council of Canada (NRC) is able to study the performance of a variety of aircraft engines, components and instruments under controlled altitude conditions. Our altitude research facility can simulate altitudes of up to 51,700 feet (15,760 metres), temperatures down to -58 °F (-50 °C), Mach numbers 0.15 to 0.8, relative humidities from 1% to 90% and representative ice crystal conditions with ice water content of up to 20 g/m<sup>3</sup> over a 55 to 700 micron median volumetric diameter range.

## Testing capabilities

- Altitude operability
- Air data probes
- Altitude restart
- Conventional and sustainable aviation fuels and hydrogen<sup>1</sup>
- Gas turbines, including APU, turboprop, turboshaft, turbojet and hybrid-electric<sup>2</sup>
- Icing and ice crystal ingestion

- Optical flow measurement instrumentation
- Reciprocating engines

<sup>1</sup> Hydrogen supply capability planned for 2026.

<sup>2</sup> 1MW electric capability planned for 2026.

## Altitude research facility specifications

Maximum flow rate (unrefrigerated undried air)	24.6 lb/s (11.2 kg/s)
Maximum flow rate (refrigerated dried air)	10 lb/s (4.5 kg/s) <sup>a</sup>
Minimum altitude (refrigerated dried air)	1,600 ft (500 m)
Maximum altitude (refrigerated dried air)	51,700 ft (15,760 m)
Minimum temperature at max. flow rate of 10 lb/s (4.5 kg/s)	-58 °F (-50 °C) <sup>b</sup>
Heated inlet air at a flow rate of up to 4 lb/s (1.8 kg/s)	+118 °F (+48 °C)

### Notes:

<sup>a</sup> 1 MW electric capability planned for 2026.

<sup>b</sup> -71 °F (-57 °C) planned for 2025.

## ●●● Contact

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The NRC's altitude research facility makes it possible to evaluate engines and components under simulated conditions and burning different fuels.

