



Human-Rated Testing

Johnson Space Center (JSC) is the world leader in human-rated testing in a simulated space environment, offering human testing in vacuum, thermal-vacuum, and vibration environments. JSC offers a collection of unique knowledge and experience as to what works well within the hostile environment of space and what does not. This knowledge is available to support crewed spacecraft and space system hardware design reviews and flight-like simulation of Extravehicular Activity (EVA) operations in pressures ranging from vacuum to one atmosphere.

Services Provided

- Human-rated hardware testing in vacuum and thermal-vacuum environments
- Space suit development testing
- Flight crew training
- Environmental control and life support system testing
 - Metabolic loading to life support systems
 - Parametric testing
 - Emergency and mobility accommodations of suited crew person
- Human-in-the-loop air revitalization system testing
 - Carbon dioxide (CO₂) removal or reduction
 - Oxygen (O₂) generation
 - Trace contaminant control
- Human-rated vibration testing



Altitude Test Facilities

Facility	Internal Volume	Pressure Range	Features
11-Foot Chamber	11' Dia x 19' L	1×10^{-2} – 760 torr	Space suit development and advanced life support systems testing
Space Station Airlock Test Article	Equipment lock: 1,100 ft. ³ Crew lock: 310 ft. ³ Observer lock: 1,570 ft. ³	1×10^{-2} – 760 torr	International Space Station Airlock, EVA hardware testing, and flight crew training
20-Foot Chamber	20' Dia x 27.5' H	1×10^{-2} – 760 torr	Long duration habitability and life-support equipment and systems testing

Thermal-Vacuum Test Facilities

Facility	Internal Volume	Temperature Range	Pressure Range	Features
Chamber B	25' Dia x 26' H	-300 °F – *	1×10^{-6} – 760 torr	Used for human testing in a thermal-vacuum environment and for crewed space operations testing. The chamber is equipped with a traversing monorail that provides weight relief to one suited crewmember at a time.
Dual Glove Box	4.5' W x 3.5' H x 1.3' D	-300 °F – 300 °F	1×10^{-5} – 760 torr	The chamber uses dual, elbow-length arms and gloves for test operations and thermal-vacuum conditions. Electric strip heaters augment gas-heating capabilities to thermally condition the test article.

Air Revitalization System Testing – Human-in-the-Loop

Provides for evaluation of air revitalization technology in the functional areas of CO₂ removal, CO₂ reduction, O₂ generation, and trace contaminant control. The facility can accommodate one to six human subjects as well as integrated hardware evaluations of multiple components.

- Provides gaseous CO₂, nitrogen, and O₂
- Includes a 10-foot chamber that can be used as a control volume for mixing of product gases from various test articles

A human metabolic simulator simulates primary humidity and CO₂ effects between one and six persons in the enclosed atmosphere.

Human-Rated Vibration Testing

JSC houses an 8,000 lbf human-rated vibration testbed that is certified to support all levels of medical monitoring. The facility can simultaneously shake the test subject and test article independently. Capabilities include random and sine sweep vibration, 5 - 80 Hz, and a six-degree-of-freedom table with max load of 500 lb.

We have developed customer-friendly agreements to streamline business relationships and are eager to share our unique facilities and expertise with new customers. We invite your inquiries regarding application or adaptation of our capabilities to satisfy your special requirements. Briefings on general or specific subjects of mutual interest can be arranged at JSC or at your business site.

Facility Testing Information

<http://jsceng.nasa.gov>

Point of Contact

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