Does your hardware need to work in extreme pressure or temperature environments? Will it undergo severe vibration, shock and load conditions? Or, will it encounter electromagnetic interference? Ball Aerospace’s Environmental Test Facilities can provide the space, resources and specialists needed to test your hardware in all the environments it may encounter.

**ENVIRONMENTAL TEST FACILITIES**

The Climactics Lab can simulate high temperature and/or high altitude environments, as well as provide thermal cycling, corrosion, air bake, cure and humidity tests. Additionally, procedures have been put into place to protect and test hardware sensitive to electrostatic discharge. The Lab’s nine chambers are staffed and operated 24/7 to provide ample resources that meet the needs of our customers.

The chambers vary in size from an 18 in. by 17 in. by 15 in. test volume to a 48 in. by 48 in. by 48 in. test volume. Ramp rates vary by chamber; all chambers are controlled by a 2704 Eurotherm Process Controller and collect data using an Agilent Data Acquisition Unit. Additionally, downflow tents are available for loading and unloading hardware. Specific test parameters include:

- **Thermal cycling:** -165° C to 260° C (varies by chamber)
- **Altitude:** sea level to 65,000 ft.
- **Humidity control:** 20% to 95%; RH 5° C to 80° C

**STANDARDS AND SPECS**
- MIL-STD-202
- MIL-STD-810

**POINT OF CONTACT**

Environmental Test at Ball Aerospace
batcTestOps@ball.com
The EMI/EMC Lab combines skilled EMC specialists with exceptional facilities to provide for all phases of military and commercial EMI/EMC testing, including emission and susceptibility testing. The lab features a sterile environment free from ambient radio frequency interference (RFI), as well as shielded anterooms for ground support equipment. Additionally, the lab utilizes the Rohde & Schwarz test data and analysis system for emission testing and the ETS Lindgren TILE!™ automated software for susceptibility data and analysis. Specific test parameters include:

- Emission and susceptibility testing: nominally 10 kHz to 18 GHz (18 GHz to 40 GHz available upon request)
- Filtered power 100 dB insertion loss from 14 kHz to 10 GHz
- Welded, steel construction provides:
  - E-Field attenuation: 100 dB from 10 kHz to 10 GHz
  - H-Field attenuation: 30 dB at 1 kHz, 95 dB at 100 kHz
  - Plane wave attenuation: 100 dB from 100 MHz to 10 GHz

### Standards and Specs

- MIL-STD-202
- MIL-STD-810
- MIL-STD-154
- NASA-STD-7003

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The Dynamics Lab simulates the vibration, shock and load conditions that hardware might experience during space launch, high altitude flight, super-sonic flight, collisions, rough terrain and more. During and after testing, the Lab analyzes the performance of the hardware with real-time data analysis (i.e., IDEAS 6.4 and Bruel & Kjaer) and post-processing. Specific test parameters include:

- Vibration: random, sine, mixed mode, sine burst
- Shock: simulated, pyrotechnic and classical
- Loads: dynamic, static

### Standards and Specs

- MIL-STD-202
- MIL-STD-810
- MIL-STD-154
- NASA-STD-7003