SPACE QUALIFICATION

The Space Dynamics Laboratory (SDL) has developed extensive capabilities over 65 years to qualify hardware for space. With skilled engineering staff and state-of-the-art facilities and equipment, SDL is a one-stop shop for space qualification.

FEATURES

- Precision cleaning laboratory
- ISO 5 cleanrooms
- ISO 7 integration high bays with ISO 5 tents
- 100' long cleanroom designed specifically for optical testing
- Analytical chemistry & microscopy laboratories (cleanliness certifications)
- Cold-wall (LN_2) thermal vacuum chambers*
- Thermal cycling*
- Vibration testing*
- EMI/EMC testing*
- Stray light testing
- Lifetime testing

ISO 5 cleanroom environment.

CONTAMINATION CONTROL

SDL leads the industry in applying contamination control theory and practice to the development of high-performance electro-optical sensors. Pre-launch and on-orbit cleanliness requirements are derived from sensor performance goals and are implemented using state-of-the-art laboratory facilities.

A preventive approach to controlling contamination entails planning and implementation throughout all project phases. Effective contamination control begins at the study phase and continues through design, manufacture, integration, test, launch, and on-orbit operations to meet end-of-life performance requirements.

Modeling

- Spectral response
- Particulate fallout
- On-orbit degradation
- Spacecraft charging

Materials Characterization

- ASTM E595 (%TML, %CVCM & %WVR)
- ASTM E1559 (outgassing kinetics)
- Thermal gravimetric analysis
- X-ray fluorescence screening
- Optical microscopy with digital image analysis

Cleanliness Certifications

- ISO 14644-1 (cleanrooms)
- IEST-STD-CC1246 (sample analyses)
- Outgassing & offgassing analyses
  - Quartz crystal microbalances
  - Infrared spectroscopy

* Available for SDL's contracted missions only.

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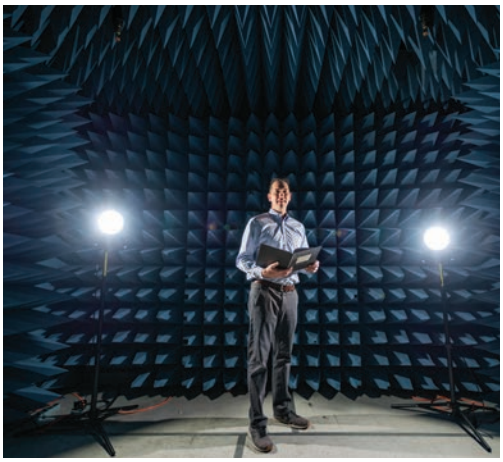
SPACE QUALIFICATION



EMI/EMC chamber.

Slip table.

TVAC chamber.

Small satellite verification & validation.

EMI/EMC

Emissions and susceptibility (EMI/EMC) testing is available for SDL's contracted missions. Our radio frequency-shielded semi-anechoic chamber enables testing for various electronic hardware and instruments per the MIL-STD-461G standard.

Characteristics

- Anechoic chamber
- 15' x 11' working space

Test Capabilities (MIL-STD Specifications)

- Conducted emissions
- Conducted susceptibility
- Radiated emissions
- Radiated susceptibility

VIBRATION

Vibration testing is available for SDL's contracted missions. SDL uses a UDC R24 vibration test system designed to provide reliable performance for medium- and high-force applications. The system is controlled by the m+p VibRunner™ control and analysis workstation. This powerful vibration and shock controller is configurable for the advanced control and analysis required for engineering development.

- Sine burst, force limiting & signal analysis
- Sine: 13,000 lbf (58 kN) pk
- Random: 12,500 lbf (56 kN) rms
- Classical shock: 25,000 lbf (111 kN) pk
- 5,000 lbs rating
- Slip table for three-axis testing of large-volume payloads

THERMAL VACUUM

Thermal vacuum (TVAC) testing is available for SDL's contracted missions. SDL has a range of TVAC chambers available. TVAC testing verifies spacecraft performance through environmental extremes in a simulated space environment. This is one of the most important environmental tests to perform to mitigate risks.

- Up to 12'6" diameter chambers
- -269°C to 150°C temperature range
- Ultra-high vacuum chambers
- Materials & component-level vacuum bakeout
- Safety interlocks to protect sensitive test hardware
- Outgassing diagnostic (RGA, QCM, scavenger plates)
- Data acquisition systems

SMALL SATELLITE VERIFICATION & VALIDATION

Proper testing reduces preflight risk and enables engineers to verify requirements before flight. SDL offers comprehensive small satellite testing to verify and validate satellite system and subsystem performance.

For SDL's contracted missions, SDL performs testing for small satellite attitude determination and control subsystems (ADCS), power subsystems, communications subsystems, and mass properties measurement.

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