SPACE QUALIFICATION SERVICES

The Space Dynamics Laboratory (SDL) has developed extensive capabilities over 60 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 services.

FEATURES

- Precision cleaning laboratory
- ISO 5 cleanrooms
- ISO 7 integration high bay with ISO 5 tents
- 100 ft-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

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SDL/10-163 Rev. D

SPACE QUALIFICATION SERVICES

EMI/EMC chamber

EMI/EMC

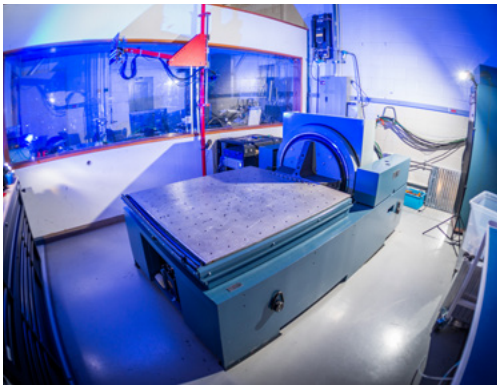
SDL's radio frequency-shielded semi-anechoic chamber is available for emissions and susceptibility (EMI/EMC) testing of various electronic hardware and instruments per the MIL-STD-461E standard.

Characteristics

- Anechoic chamber
- 15' x 11' working space

Test Capabilities (MIL-STD Specifications)

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

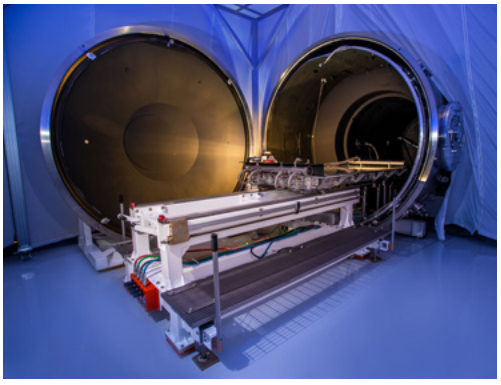


Slip table

VIBRATION

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



TVAC chamber

THERMAL VACUUM

SDL has a range of thermal vacuum (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' diameter chambers
- -269°C to 150°C temperature range
- Ultra-high vacuum chambers
- Materials & component-level vacuum bakeout
- Automated control with safety interlocks
- Outgassing diagnostic (RGA, QCM, scavenger plates)
- Data acquisition systems

SmallSat V&V Lab

SMALLSAT VERIFICATION & VALIDATION (V&V) LABORATORY

Proper testing reduces preflight risk and enables engineers to verify requirements before flight. The SmallSat V&V Lab augments SDL's environmental testing and calibration facilities to enable comprehensive small satellite testing to verify satellite system and subsystem performance.

The V&V Lab includes equipment for performing tests of small satellite attitude determination and control subsystems (ADCS), power subsystems, and communications subsystems, and for measuring mass properties.

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