



NASA's Strategic Capabilities Assets Program

NASA MARSHALL SPACE FLIGHT CENTER

SUNSPOT THERMAL VACUUM TESTING FACILITY



Sunspot is a 12-foot thermal vacuum facility located at the NASA Marshall Space Flight Center Environmental Test Facility (ETF) in Huntsville, AL.

Sunspot is extremely valuable in providing thermal vacuum testing for private industry; DOD; and NASA programs such as the Space Shuttle, Spacelab, the Hubble Space Telescope, Burst And Transient Source Experiment (BATSE), Chandra, the International Space Station (ISS), the James Webb Space Telescope (JWST), and Ku-Band. Sunspot has been NASA's workhorse chamber for 33 years.

Large test articles may be lowered into Sunspot through the top of the chamber via an overhead crane. Man-door access is provided via a 10,000 (ISO Class 7) clean room.

Sunspot is a vertically oriented stainless steel cylindrical vessel. The overall dimensions are 12 feet in diameter by 15 feet tall, with the internal shroud reducing the test article area to 10 feet in diameter by 12 feet tall. Instrumentation available includes thermocouples, temperature-controlled quartz crystal microbalances (TQCM), and a residual gas analyzer (RGA). Thermal conditions are met with a full liquid nitrogen shroud (to $-195\text{ }^{\circ}\text{C}$); infrared (IR) lamps provide heating (to $+200\text{ }^{\circ}\text{C}$). One maglev turbopump provides vacuum to 1×10^{-6} Torr. The pumping system for Sunspot includes one 52-inch cryopump and one maglev turbopump.



FACILITY CAPABILITIES

| | |
|------------------------|--|
| Overall dimension | 12 feet in diameter x 15 feet tall |
| Test article area | 10 feet in diameter x 12 feet tall |
| Data system | Pacrats IFIX |
| Temperature range | $-170\text{ }^{\circ}\text{C}$ to $+200\text{ }^{\circ}\text{C}$ |
| Pressure | 1×10^{-6} Torr |
| Thermocouples | 180 |
| LN ₂ shroud | Yes |
| Lamps | Nine zones, 6x 1,600-watt IR bulbs each |
| RGA | Yes |
| TQCM | Yes |
| Internal camera | IR and color |
| Viewports | Three (one is IR compatible) |
| Facility application | Commercial, military, and NASA programs |

CONTACT INFORMATION

<http://ed.msfc.nasa.gov/etf/index.html>

Manuel Schultz

NASA Marshall Space Flight Center

(256) 544-5465

E-mail: Manuel.V.Schultz@nasa.gov