

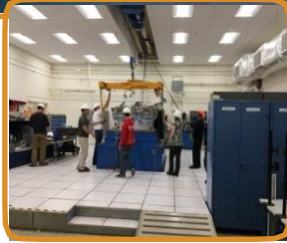


Marshall Space Flight Center Test Laboratory

Engineering Solutions for Space Science and Exploration



Test Position for Ares 1 Subscale
Acoustic Test at TS 116



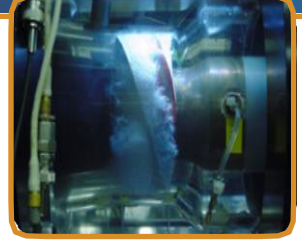
NASA Docking System Vibration
Test at West Vibe Lab



Space Launch System Liquid
Oxygen Tank Structural Test



Space Launch System Sub-scale
Acoustic Test TS 116



Space Shuttle Main Engine LOX
Inducer Test at Fluid Facility

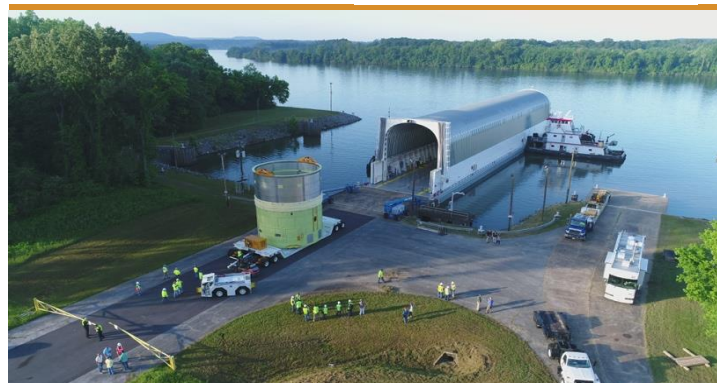
Marshall's Test Lab

Encompasses a wide range of specialized capabilities that NASA uses to conduct testing for space flight hardware research, development, qualification, acceptance, and anomaly resolution. TestLab's 50-year experience base is a foundational piece of the Agency's investment in safely conducting the most challenging human and scientific missions ever performed.

Test Lab has partnered with the Department of Defense, academia, and industry to leverage its unique facilities and services. From computer model validation, to development and qualification testing, data for engineering analyses leads to informed decisions and significant risk reduction.



Space Launch System Hydrogen
Tank Structural Test



Aerospace hardware anomaly resolution and long-term maintenance are two areas where Test Lab offers extensive databases and personnel with direct, hands-on experience to solve flight-critical questions.

Knowledgeable civil service and contractor workforce who operate Test Lab have more than 1,000 years of combined experience in highly specialized fields. With this comprehensive background, the Test Lab team evaluates mission needs and develops methods to achieve critical test objectives and deliver vital test data.

Test Lab facilities accommodate test articles at any technology readiness level and comply with ISO9001/AS9100, OSHA VPP, and ISO 14001. The team has years of demonstrated reliable and safe operations, with physical security provided by the U.S. Army Redstone Arsenal and NASA. Marshall's Test Lab is conveniently located near major transportation lines.

While testing NASA's space hardware is TestLab's main goal, the group also supports other government agencies, industry, and academia through Space Act Agreements and alternate contractual mechanisms.

Test Lab can provide a low cost alternative with existing infrastructure allowing rapid test planning/build-up and provide end-to end services from design to data delivery.

NASA's logistics services make it simple to access our capabilities with the largest of test articles

Capabilities

Propulsion



- > Solid, liquid, and hybrid propellant test capabilities for component, scale model, and system level testing up to 7.5 million lb of thrust.
- > Pressurants & propellants include: LOx, LH₂, LCH₄, and RP-1 and Center-wide cross country systems for GN2, GH2, GHe, and missile-grade air.

Environmental Testing



- > Material Environment Test Complex performs multiple-environments testing and material evaluation.
- > 28 test chambers simulate extreme space environments, including thermal vacuum, humidity, altitude, cryogenic, and corrosion effects.
- > The Aerodynamic Research Facility, an intermittent trisonic blow-down wind tunnel, tests subscale models for vehicle designs.

Structural Strength



- > Tensile test machines for structures (up to 25 feet) verify strength to 3M lbf.
- > Hazardous structural test bay, used with reaction structures is rated for 2.5M lbf.
- > The cryogenic structural test stand accommodate test articles to 33 feet in diameter.

Structural Dynamics



- > Vibration tests utilize 8 electronic exciters and 5 amplifiers.
- > Reverberation, progressive wave tube, and anechoic chambers comprise the acoustic test facility.
- > Modal test facility used to perform Experimental Modal Analysis.

Other Services



- > Special Test Equipment design includes test stand design and modifications.
- > Fabrication, valve lab, calibration facility, and handling crews are available in-house.
- > High-speed photography and video supplement data acquisition technologies.



Test Lab assets range from one-of-a-kind to highly adaptable; supporting human-rated launch vehicle development, high technology science missions, and various industry programs.

Key Benefits

- > Full life-cycle testing and evaluation capabilities from materials development and proof-of-concept articles up to qualification of integrated systems.
- > Budget analysis and risk management available in-house.
- > Workforce & facility flexibility are necessary to meet customer needs.

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