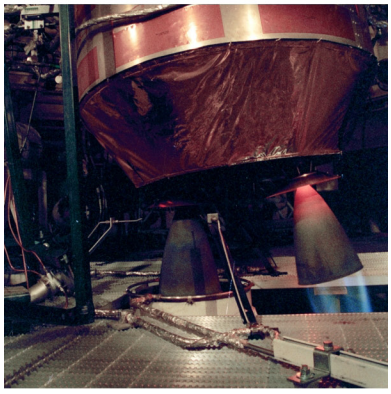
Propulsion facts

NASA White Sands Test Facility (WSTF) offers numerous ambient pressure and altitude simulation stands to test rocket propulsion systems, as well as single rocket engines. WSTF has extensive experience testing with hypergolic and liquid oxygen/ hydrocarbon propellants over a wide range of operating conditions.

Because of its remote location and long history of supporting NASA, DoD, and commercial aerospace programs, WSTF is the only NASA facility, and one of only a few government or private industry locations in the country, capable of testing rockets with hypergolic rocket propellants.



Altitude Testing

WSTF has six test stands that provide simulated altitude greater than 100,000 ft for engines and engine systems with thrust levels up to 25,000 lbf. Horizontal and vertical firing configurations are available.

Ambient Testing

Three test stands at WSTF support ambient firing at 5000 ft (1500 m) above sea level. Rocket engines with thrust levels up to 60,000 kbf (270 kN) can be tested. Horizontal and vertical firing configurations are available.

Propellants

Propellants available for testing at WSTF include liquid hydrogen, gaseous and liquid oxygen, hydrocarbon, hydrazine, Aerozine-50, monomethylhydrazine (MMH), nitrogen tetroxide (N_2O_4), gaseous and liquid methane, and solid rocket propellants. Propellant saturation and temperature conditioning are available. Pressurants include nitrogen and helium.

Hypergolic Propellant Handling

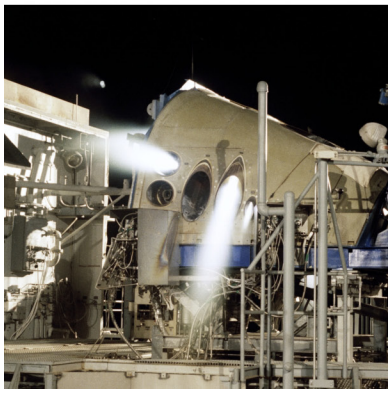
WSTF can dispatch propellant handling teams to support projects at any location. Hypergolic propellants such as hydrazine, monomethylhydrazine, nitrogen tetroxide, and unsymmetrical dimethylhydrazine have been used and stored at WSTF since 1964.

Training

WSTF can provide hands-on training to customer personnel in handling hypergolic propellants, oxygen, and hydrogen. Classes are tailored to the individual audience and can vary from intense classroom discussions of new chemical analytical techniques to field training with Level-A, total encapsulating, protective suits.

White Sands Test Facility

- Developed detailed courses on hypergolic and non-toxic propellants that cover storage, transport, safety equipment, and emergency response for NASA Johnson Space Center, NASA Glenn Research Center, Sandia National Laboratories, General Electric, commercial industry, and Department of Defense.
- Developed adequate detection equipment and PPE for use in hypergolic propellant handling.
- Researched advanced methods of treating hazardous wastes including the development, construction, and validation of a unique disposal system for hydrazine-type wastes.
- Prepared assessment and impact statements for new projects involving hypergolic propellants.
- Developed procedures for saturating hypergolic propellants with inert gases to more closely simulate in-flight conditions.



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