



## Propellants and Aerospace Fluids Testing and Analysis

White Sands Test Facility (WSTF) has a wide variety of resources to draw upon in assessing the fire, explosion, compatibility, and safety hazards of hydrogen, oxygen, the hydrazine fuels, and nitrogen tetroxide. The skills and techniques developed to assess these propellants are also being utilized to analyze other propellants of current interest such as methane.



WSTF has the infrastructure, experience, and environmental permits to handle, store, test, and dispose of shuttle and ISS propellants, such as:

- Gaseous and cryogenic hydrogen
- Gaseous and cryogenic oxygen
- Hydrazine
- Monomethylhydrazine (MMH)
- Unsymmetrical dimethylhydrazine (UDMH)
- Aerozine 50
- Nitrogen tetroxide and variants such as MON3



### Unique Facility Offerings

- Large Buffer Zone and Controlled Remote Property for Hazardous Testing
- Moderate Desert Climate Ideal for Year-round Testing
- Existing Environmental Permits in Place for Hazardous Testing



# Johnson Space Center

## Services Provided

### Analysis

WSTF has a wide range of analytical capabilities to support the assessment of propellants and hazardous fluids. Many of these capabilities reside in the Analytical Services Laboratories. The following are the types of analyses that WSTF can perform:

|  |               |
|--|---------------|
| Chemical                               | Thermal       |
| Spectroscopic                          | Specification |
| Environmental                          | Composition   |
| Explosion                              | Blast wave    |
| Blast source characterization reaction | Kinetics      |
| Thermodynamics                         | General       |
| Hazards                                | Failure       |

### Testing

WSTF has been conducting tests on propulsion systems, components, materials, propellants, and hazardous fluids since the 1960s. WSTF offers a wide range of test capabilities, facilities, hazardous test sites, and support services (including environmental permits) to allow for the testing and disposal of certain toxic materials.

Listed below are some of the test capabilities that are maintained at WSTF and that support the assessment of propellants and hazardous fluids:

|                                    |  |
|------------------------------------|--|
| Accelerated rate calorimetry       | Adiabatic compression                              |
| Blast effects                      | Compatibility (metallic and nonmetallic materials) |
| Corrosion (liquid and vapor phase) | Detonability (liquid and vapor phase)              |
| Electrochemistry                   | Flammability                                       |
| Frictional heating                 | Kindling chain ignitions                           |
| Mechanical impact                  | Minimum ignition energy                            |
| Particle impact                    | Physical properties                                |
| Promoted ignition/combustion       | Shock sensitivity                                  |
| Slow strain rate                   | Thermal runaway                                    |
| Ultrasonic decomposition           |  |

We have developed customer-friendly agreements to streamline business relationships and are eager to share our unique facilities and expertise with new customers. We invite your inquiries regarding application or adaptation of our capabilities to satisfy your special requirements. Briefings on general or specific subjects of mutual interest can be arranged at JSC or at your business site.



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For the benefit of all

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