



PROPELLANT VAPOR DETECTION VERIFICATION AND QUALIFICATION TESTING

SUMMARY

White Sands Test Facility (WSTF) has an active program in development, evaluation, and qualification of toxic vapor monitors for ground support and spaceflight. Through several ongoing test programs, WSTF has developed advanced methods of producing stable toxic and/or highly reactive gas streams from the parts per billion to the percent level in a variety of carrier gases. In conjunction, the methods for quantitatively trapping and analyzing these gas streams were developed. The gold salt hydrazine detector currently used in the space station and shuttle airlocks was invented, developed, and flight qualified at WSTF.

BACKGROUND

Due to the toxicity of some propellants used currently in launch vehicles, vapor detectors are used by NASA facilities for personnel protection, monitoring for residual propellant contamination, fluid system leak detection, and permeation testing of personal protective equipment (PPE). WSTF propellant vapor detection capabilities include design and development as well as evaluation of commercial portable and remote sensors. WSTF offers sensor development and evaluation capabilities based on extensive experience in production and analysis of vapor streams, as well as monitor response testing. Gas streams ranging from combustion products to propellants such as monomethylhydrazine (MMH) and dinitrogen tetroxide have been produced for monitor evaluation and reactivity studies. WSTF has successfully designed, fabricated, and completed a series of tests to qualify a propellant vapor sensor for flight on the Space Shuttle and the International Space Station. The WSTF developed sensor continues to provide vapor detection in space today.

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