



## Advanced Monitoring for Hypergolic Leaks

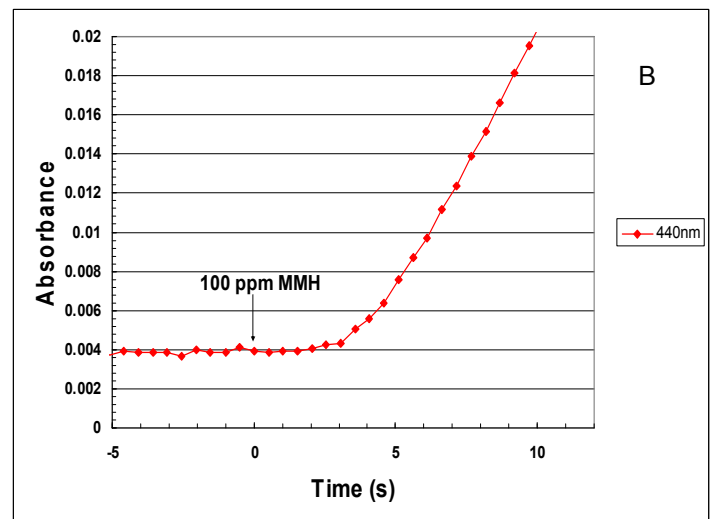
Eltron Research & Development has developed a simple, highly effective leak monitoring system for hypergolic fuels and oxidizers. These materials make up the propellant systems for Ballistic Missile Defense platforms currently in development, such as the Kinetic Energy Interceptor (KEI) and Theater High Altitude Area Defense (THAAD). Safety assurance by leak detection during storage and deployment is key to the operational readiness of these platforms. Eltron's technology provides a reliable means to ensure the integrity of missile rounds deployed on land or sea.

### Benefits

- High stability
- Low noise
- Rapid & accurate leak detection
- Long-term reliability

### Benefits & Features

This technology has been proven to meet the safety needs of Ballistic Missile Defense Systems. Even at this early stage of development, it meets the majority of performance requirements of both programs. Compared to current indicator strips that discolor with time, Eltron's hypergolic leak detection technology offers exceptionally high stability and low noise which results in long term reliability. The rapid leak detection response allows up to 12 missile canisters to be polled within 1 minute, in the case of MMH (100 ppm concentration).

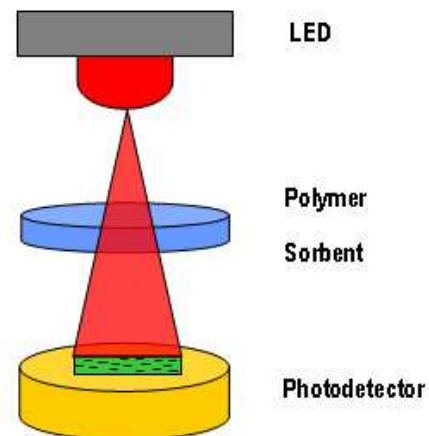


*The transducer responds rapidly to a fuel leak with positive indication within 5 seconds. Six missile canisters can be sequentially polled in roughly 30 seconds.*

### The Technology

This hypergolic leak detection technology provides rapid and sensitive response to hypergolic fuel

(hydrazines, MMH) and oxidizer (nitrogen tetroxide, NTO, and its decomposition products nitrogen dioxide, NO<sub>2</sub> and nitric oxide, NO) leaks using a simple colorimetric device. Colorimetric polymer coatings detect MMH and NO<sub>2</sub> at 10-300 ppm and 10-100 ppm, respectively. The detector provided high confidence leak detection response to 100-300 ppm MMH in seconds, and to 100 ppm NO<sub>2</sub> in less than 1.5 minutes at room temperature. These fast response rates enable rapid polling of multiple sensors, for example sensors located in multiple missile round canisters, during storage or deployment. Slow and rapid leaks are readily differentiated. Fuels and oxidizers produce opposite colorimetric effects, providing diagnosis of the nature of the leak. The sensor has been demonstrated to operate effectively between -43°C (-45°F) and 49°C (120°F). Sensor performance is unaffected by changes in relative humidity; functions fully in the dry environment inside a round. The sensor performs equally well in air or inert nitrogen atmospheres. Sensors can be monitored locally by associated hardware and remotely via Internet link.



*Illustration of the basic colorimetric transducer.*

### Stage of Development

This technology has achieved proof-of-concept, funded by the Missile Defense Agency, during which we achieved most required performance specifications for both KEI and THAAD. Full-scale development of a prototype system for demonstration with primes needs to be completed.

The technologies described, and all related inventions are owned by Eltron Research & Development Inc, and protected by copyrights, trademarks, issued and pending patents, trade secrets, or other applicable intellectual property rights.

### Contact Us

To discuss the possibility of entering into a business relationship with Eltron, contact the Business Development Group at [business@eltronresearch.com](mailto:business@eltronresearch.com).

To learn more about Eltron Research & Development and the many other technologies that the company is researching and commercializing, visit [www.eltronresearch.com](http://www.eltronresearch.com).



### Eltron Research & Development Inc.

Eltron Research & Development commercializes novel technologies involving energy, chemicals, advanced materials and environmental systems.