

Highlights

Explosion of volatile liquids and gases resulting in severe fire conflagrations are real hazards of modern life, involving high economic costs and too often, injury or loss of life. The EXPLOSAFE® Explosion Suppression System is a practical method of preventing containers of volatile liquids and gases from exploding from various causes of ignition, including sparking, maintenance error, electrostatic discharge, external crash fires, gunfire or terrorist activity.

The EXPLOSAFE System is based on a matrix of expanded aluminum alloy foil, slit and expanded to form a mesh of hexagonally-shaped openings. When layered, the mesh results in an open-celled bulk batt which can be cut to sizes and shapes to fit any container/fuel tank.

The EXPLOSAFE baffle material is manufactured on proprietary machinery and equipment designed specifically to optimize quality and performance as an explosion suppression material.

The Explosafe System is pre-engineered and designed for each specific application, then fabricated into a modular "kit" form for installation into fuel tanks at time of manufacture; voiding where appropriate to accommodate internal components. Retrofit applications in existing fuel tanks can be accomplished with adequate access availability. Our engineers are capable and willing to work with fuel tank designers and manufacturers to develop the most suitable design and installation techniques.

How it works

The objective of the EXPLOSAFE® Explosion Suppression System is to prevent destructive pressures from being generated after the explosive ignition of vapors or gases. These pressures arise when heat is released by rapid self-sustained burning. While appearing to be instantaneous, this burning reaction in fact takes measurable time and its progression can be recorded and analyzed.

Research has yielded an extensive data base on mechanisms which may be introduced to moderate the reaction and therefore suppress an explosion. "Quenching" the reaction by dividing the container into minute cells which inhibit flame propagation is one way. Another is to absorb the heat released during the reaction with a porous filler mass of high heat absorptivity.

The Explosafe System utilizes each of the above two mechanisms to a degree. The layered, cellular structure of the filler mass has a high specific surface area per unit volume and excellent heat absorption capacity. These qualities work together, to partially quench rapid burning and absorb almost all of the heat released by the modified reaction.

Performance

The Explosafe has passed every key qualification test in its field and is proven protection against the catastrophic explosion hazard of volatile flammable liquids and gases.

A joint USAF/Canadian Government development test program was conducted over a three years period to evaluate the explosion suppression performance and capabilities of the Explosafe System is reported in USAF Report AFWAL-TR-80-2043, titled Evaluation of EXPLOSAFE® Explosion Suppression System for Aircraft Fuel Tank Protection. This report resulted in a news release from the United States Air Force, Wright-Patterson AFB, Ohio, stating the effectiveness of the Explosafe System to prevent explosions in the event of combat gunfire or other ignition sources and, issuance of the U.S. Government military specification MIL-B-87162A (USAF) covering Baffle Material, Explosion Suppression, Expanded Aluminum Mesh, for Aircraft Fuel Tanks.

Features and benefits

The most important reason to choose our system is the awareness of safety, which is a hidden benefit, with important cost savings. Employee awareness and attitude can change dramatically with the knowledge that equipment and storage tanks are protected. Here are some of the additional benefits of the EXPLOSAFE® Explosion Suppression System:

- **Full-Time Maintenance Free Protection**

Around-the-clock, everyday, year-in, year-out, the EXPLOSAFE System is passive, requiring no costly logistic support program.

- **High Temperature**

Excellent in High Temperature Environment

- **Long Life**

Replacement Cost only in the Long Term

- **Easily Installed**

The EXPLOSAFE System can be formed and shaped to meet all installation requirements, new and retrofit.

- **Electrostatic Charge Dissipation**

The metallic foil provides a grounded matrix throughout the tank interior. The EXPLOSAFE System is unsurpassed in its ability to dissipate electrostatic charges resulting from fuel flow and turbulence.

- **Low Weight Penalty**

In airborne applications, thirty-seven grams/liter or 5 ounces/US gallon.

- **Slosh and Surge Reduction**

The EXPLOSAFE System prevents rapid liquid movement and dangerous shifts in the center of gravity. Tests have shown slosh reduction on tank walls by a factor of forty with moderate, sinusoidal accelerations.

- **No Effect on Fuel System Performance**

Aluminum alloys are widely used in fuel systems. Fuel flow continues smoothly without any adverse effect.

- **100% Recyclable**

The disposal of aluminum alloys does not require any special facility or environmental requirement.

- **Fuel Displacement and Liquid Retention**

The EXPLOSAFE System is metallic and therefore non-absorbent. Fuel retention and displacement are negligible