

Vehicle Stopping Foam

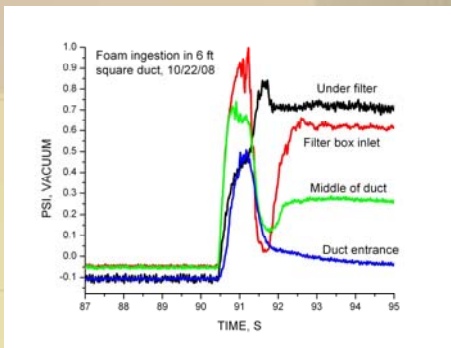


Chemical Engineering
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The Technology

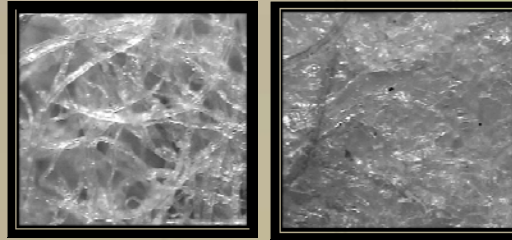
Vehicle Stopping Foam (VSF) provides a nonlethal means by which a car or truck can be stopped for threat assessment. Internal combustion engines require an air-fuel ratio (AFR) of about 15:1 to operate properly. The AFR band is narrow and disruption of the ratio prevents an engine from running. VSF is easily aspirated by a vehicle's induction system; carbon dioxide released by the foam disrupts the AFR and foam additives block pores in air filter media. The system is effective against both gasoline and diesel engines and the foam has minimal environmental impact.



Dynamic record for pressure (vacuum) in test apparatus. Flow was induced at $t=90.5$ s, and complete blockage is apparent by $t=92$ s.

Methods

Vehicle Stopping Foam has two modes of operation: (1) carbon dioxide (CO_2) completely quenches combustion and (2) foam residue rapidly blocks the pores in air filter media.



Magnified images of FRAM™ air filter surface untreated (left) and following exposure to modified foam (right).

Applications

The Vehicle Stopping Foam may be used where a vehicle-based threat needs to be neutralized. Examples include:

- Security checkpoints
- Border patrol
- Perimeter control for public venues and the nation's high-priority infrastructure sites
- Military and law enforcement field operations

Laboratory Research

Extensive laboratory testing has revealed consistent behavior of the foam in small scale systems. The effectiveness of the foam additives with respect to blocking pores in the air filter media is remarkable, and the feasibility of this concept has been demonstrated repeatedly at bench-top scale. The goal is to scale-up the system and prove functionality in an operational environment.



Filter box in laboratory apparatus; suction is applied by a vacuum on the right and foam enters from the left.



Typical response of full-size FRAM™ air filter to exposure to foam in ingestion experiments.

For More Information:

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