



# *SUPPRESS X-S*

## PRODUCT DESIGN AND MATERIALS TECHNOLOGY PANEL PRESENTATION

January 26, 2006  
10:30am – 11:15am  
Panama City, Florida

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# *SUPPRESS X-S*

*The core technology of Suppress X-S is the eXess product, a novel aluminum mesh technology with remarkable properties providing effective, lightweight and cost-efficient methods of fire and explosion suppression.*



# *SUPPRESS X-S*

## The eXess Product

- Expanded aluminum mesh
- Manufactured in network or cylinder form
- Acts as a natural heat sink
- Neutralizes the effect of volatile vapors
- Enhances structural integrity of vessel



# *SUPPRESS X-S*

## Markets

- Military
  - *IED and RPG Mitigation*
  - *Fuel Storage*
- Homeland Security
  - *Tanker Trucks / Rolling Bombs*
  - *Fuel Farms*
- Auto Industry
  - *Fuel Tank Protection*
- Civilian - Commercial Armoring Up
  - *Vehicle Fuel Tank Protection*
- Emerging Technologies
  - *Fuel Cells*



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## Customers

- United States Department of Defense
- Labock Technologies
- United Technologies
- St. George's Group
- Key Span Energy Systems
- Long Island Power Authority
- Hempstead Ford
- Armet



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## Applications

➤ Fuel and Gas Tanks:

*Land, Air and Sea*

➤ Fuel and Gas Transport:

*Trucking and Off-loading*

➤ Fuel and Gas Storage:

*Ports, Tank Fields, Utilities*

➤ Fuel Cells:

*Hydrogen Chambers, Evaporation*

➤ Blastwall Protection:

*Building, Trash/Cargo Containers, RPG Diffusion*



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## eXess

- Cost-effective pricing
- eXess increases safety and survivability
- Think inside the tank
- Lightweight protection
- Performance enhancement
- Permanent passive solution



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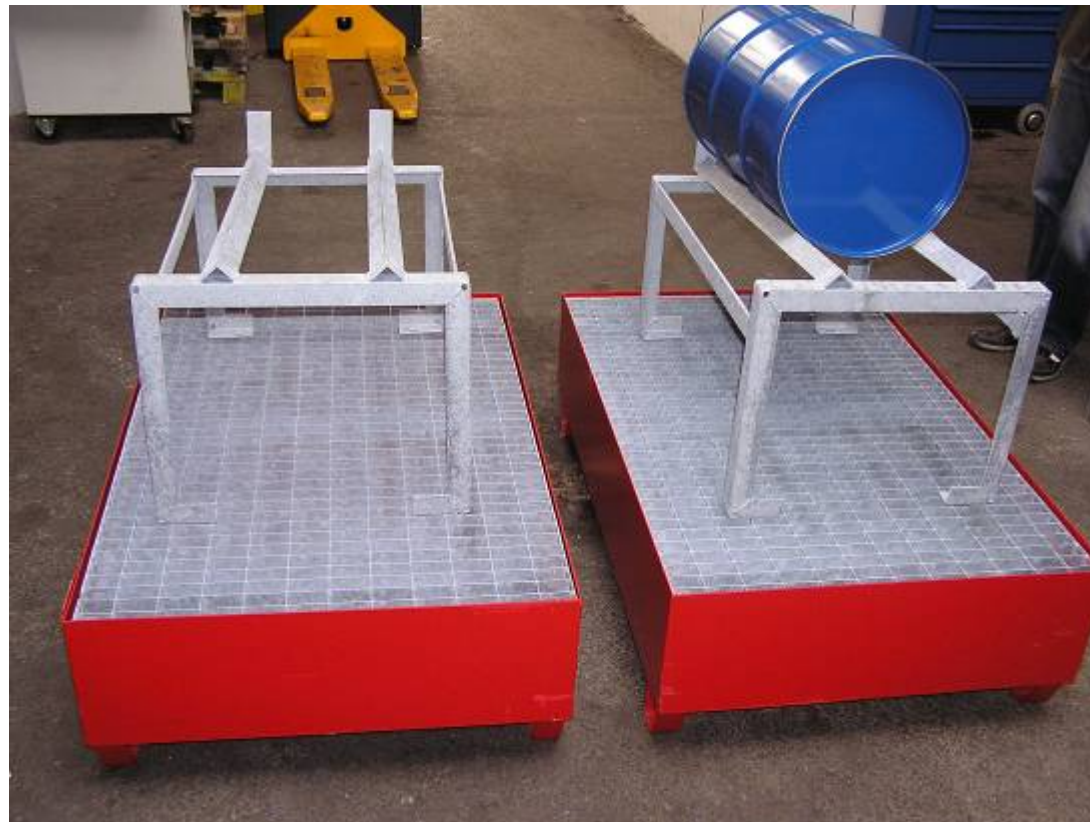
## eXess Depictions

- Comparative Demonstration of Effectiveness of eXess in Fuel Containers
- Graphic Depiction of eXess Floating Roof



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A comparative demonstration was conducted on two 200-liter containers of fuel at an Austrian Fire -Testing facility in November 2005, to highlight the effectiveness of eXess, a honeycombed network of aluminum metal mesh

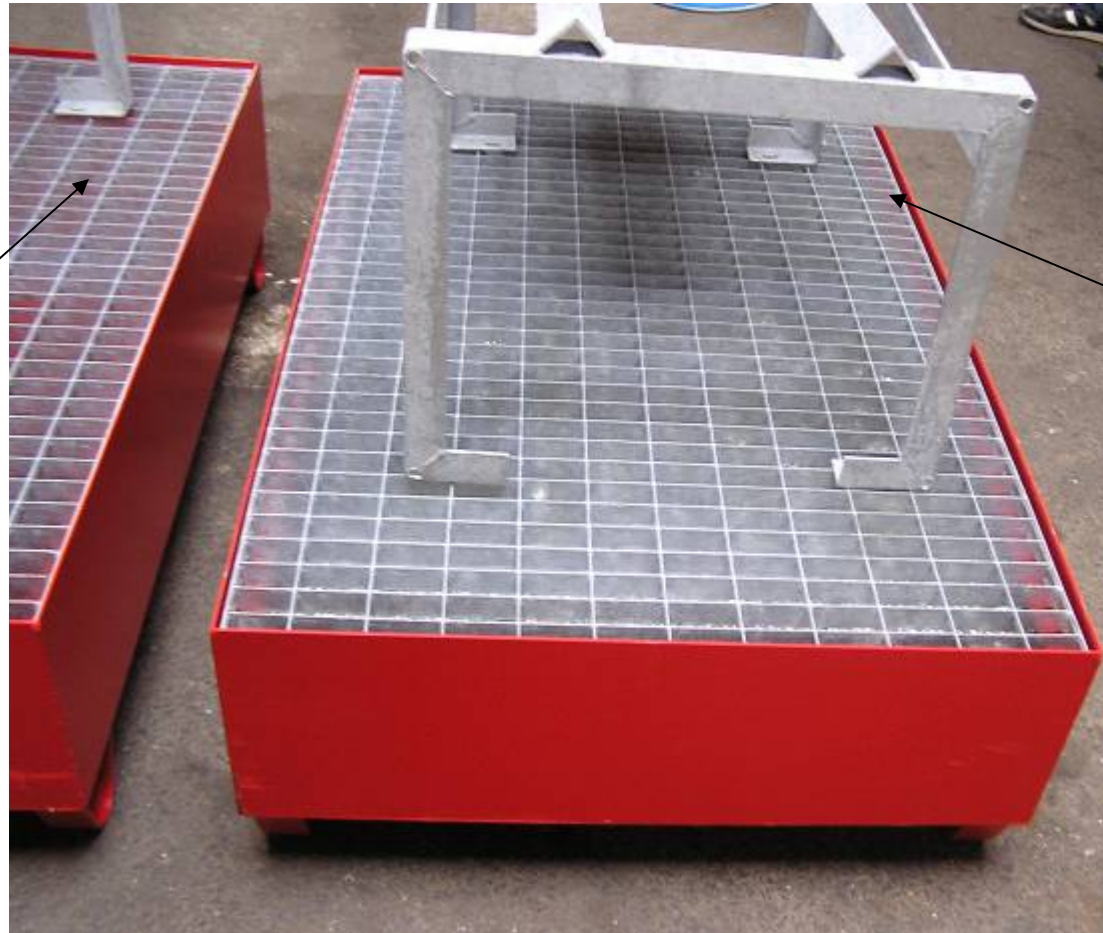




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The fuel container on the right was equipped with the eXess product (eXess displaces approx. 01.5% of fuel volume)

without eXess



with eXess



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Two 60-liter drums were erected on stands above the fuel containers for temperature measurement purposes



without eXess

with eXess



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Two temperature tests were performed on the metal surfaces, utilizing a data device of Pico Technology:

1. Measurement of the temperature increase within the drums after ignition of the fuel container (left picture)
2. Measurement of the temperature on the grid surfaces of the fuel containers (right picture)





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## Test 1: Temperature increase in the mounted drums

- a. Both drums were filled with 10 liters of water  
(kerosene not permitted due to security concerns at the facility)
- b. Containers were filled with kerosene

**CONCLUSION:** The fuel container protected with eXess developed only a minor flame front and considerably less smoke was generated. The drum above the fuel container unprotected by eXess was visibly warped at the top flange and would have burst had not a leak developed, relieving pressure. The effectiveness of eXess in a flaming tank container is apparent from the following slide showing both fuel containers after several minutes of having been set ablaze.



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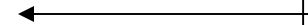




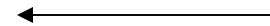
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max.  
temperature  
approx.  
107°C



max.  
temperature  
approx.  
16°C





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Test 2: Temperature readings on grid surface of fuel container

- a. Fuel containers and drums utilized in Test 1 were reused for Test 2
- b. Fuel containers were both filled with kerosene

**CONCLUSION:** The fuel container protected with eXess developed only a minor flame front and considerably less smoke was generated. The drum above the fuel container unprotected by eXess has torn apart as a result of the flames. The fuel container unprotected by eXess is considerably warped due to the high temperatures of the burning fire. The two fuel containers showed a difference in burning temperatures of approximately 800 degrees. As is apparent from the next slide, the fuel container protected by eXess shows no warping.

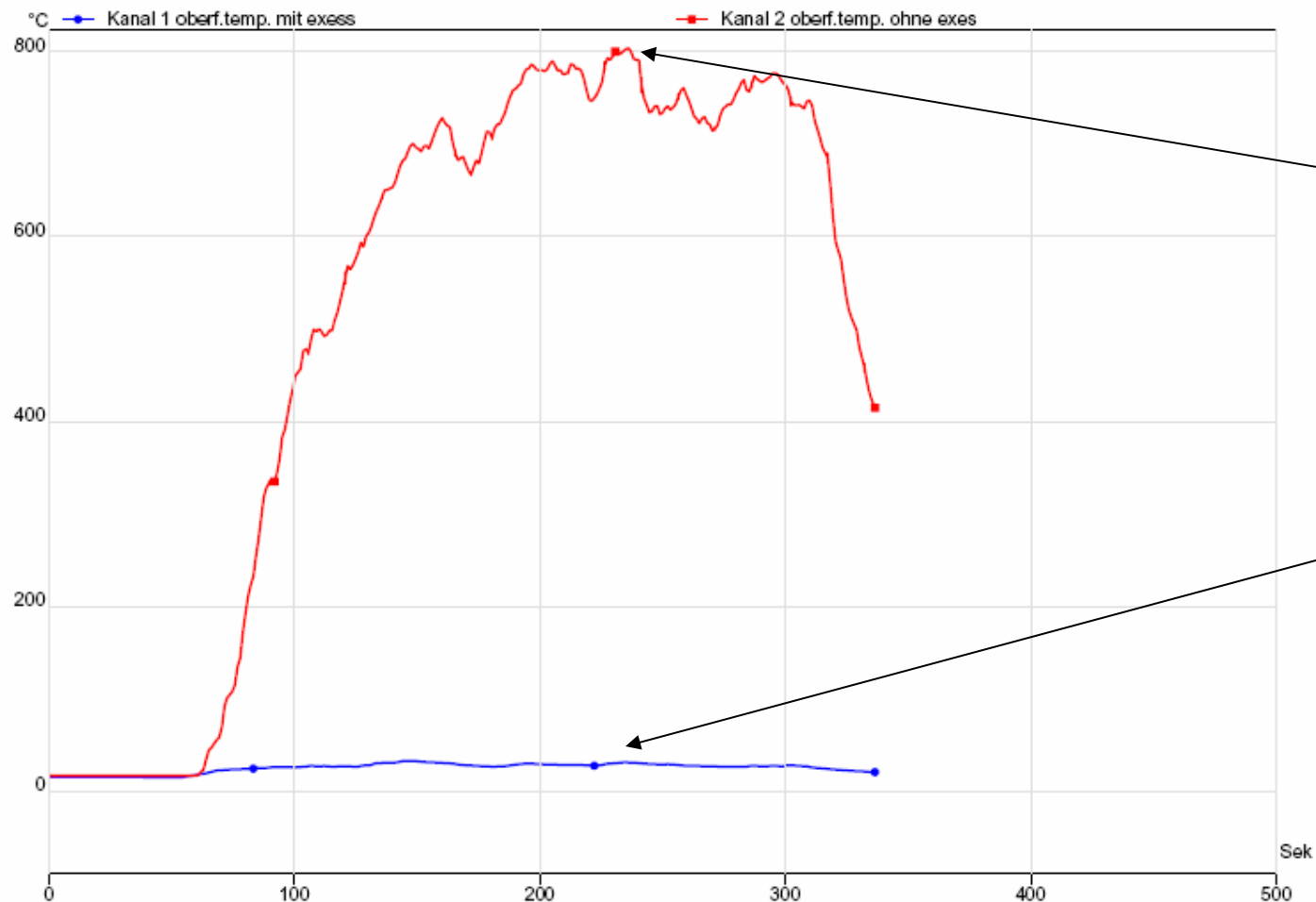


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max.  
temperature  
approx.  
804°C

max.  
temperature  
approx.  
31°C



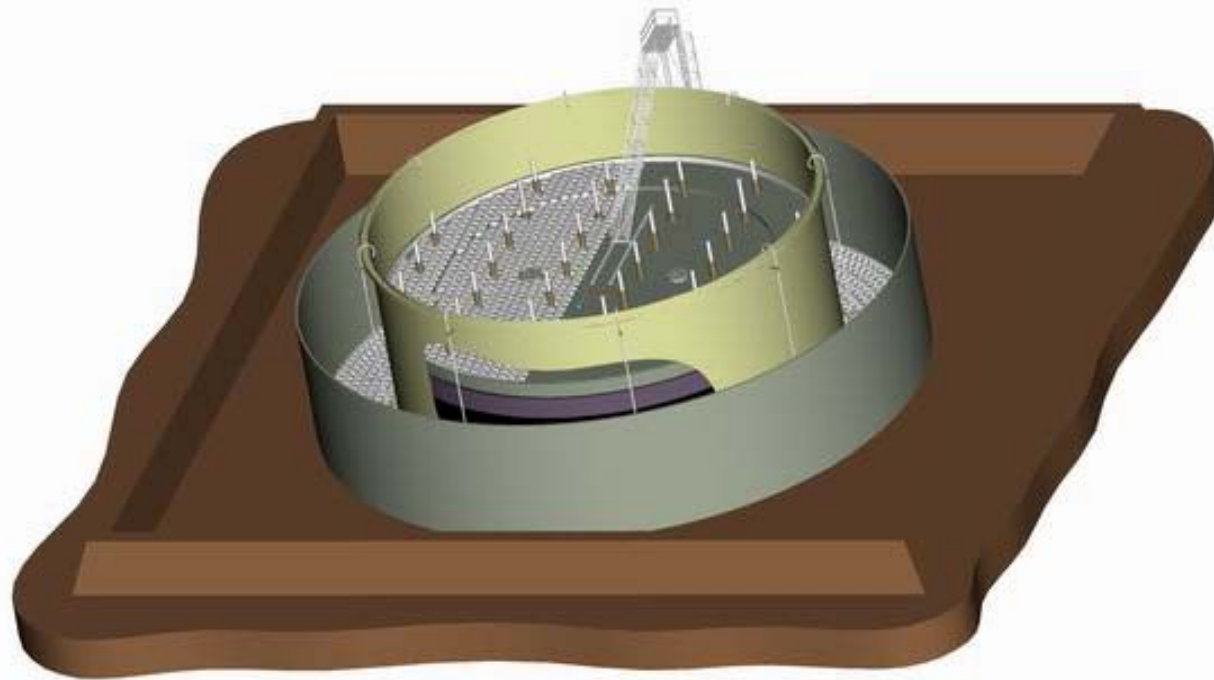
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# *SUPPRESS X-S*

Graphic depiction of a floating roof structure containing a layer of eXess material, connected to ductwork from which would flow an extinguishing foam into the flame below. An overflow tank is also protected with eXess. Burn temperatures are reduced to 300 degrees Centigrade from 800 degrees Centigrade.





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## Why eXess?

The benefits of fuel containers protected with eXess are very clear:

- Significant reduction in flame temperature
- Significant suppression of smoke development
- Reduction in likelihood of surface deflagration and flame propagation
- System acts as a heat sink, controlling flames
- Facilitation of extinguishing flames
- Reduction in danger to human life and collateral damage
- Product cost offset by reduction in insurance premiums



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The End