

# FIRES ON THE LOADING DOCK



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## What Your Company Should Know

*Presented by:*



Frommelt®

**RITE·HITE®**  
Intelligent Dock Design.™

## DID YOU KNOW...

Intense heat generated by trailer marker lights backed against foam dock seals can cause the pads to ignite in as little as 20 minutes?

The dock seals, the trailer and its contents, your building and your people are all at risk should a fire break out. The following information is provided by the engineering team at Frommelt to help you understand the source and consequences of this risk as well as the technology behind the only current industry solution.



### Where is the heat coming from and why is it so intense?

Federal Motor Vehicle Safety Standard 108 (FMVSS) requires all trailers over 80 inches wide to have (3) rear identification lamps and (2) rear clearance lamps on the top back of the trailer. The simple fact that the lights are required is not the entire reason why they are so hot. As more tractors are retrofitted with larger alternators to run abundant on-board equipment (VCR, TV, microwave, satellite dish, GPS, etc.), the output of the newer alternators increases, making the lights work on higher voltage systems. Some tractors run at almost 14 volts, versus the standard 12 volts that the lights are designed for.



Testing has shown that trailer marker lights, left energized against a typical compressed dock seal head pad, can generate temperatures at the light in excess of 900° F in less than one hour. This very rapid increase in heat is a result of a hot marker light being insulated by the foam seal, building the temperature up in a concentrated area.

(Note: Some trailers are being equipped with LED marker lights, which do not generate this intense heat. The population of these trailers is still low, however, and most docks should expect to receive a majority of trailers with standard lights that can cause the rapid generation of high heat.)

### What causes the head pad to combust?

The temperature of the heat generated by the marker lights exceeds both the melting point of vinyl and rubber based fabrics (typical dock seal coverings) and, more importantly, the auto-ignition point of polyurethane foam (typical dock seal interior component), releasing highly flammable decomposition gasses. This means that when a trailer pulls away under these conditions, the foam pad expands and draws a large amount of oxygen laden air into the pores of the foam through the hole now melted in the cover fabric. In these circumstances, it is possible for the flammable decomposition gasses to auto-ignite, causing a fire in the foam core.

### At what point does scorching or "melting" of the header seal fabric risk total combustion? (i.e., why should I be concerned if I see those beginnings of scorch marks in my dock seal head pads?)

If slight damage is seen in a dock seal head pad, there is most likely more damage hidden behind the fabric cover on the pad. The outer fabric (regardless of material type) will withstand higher temperatures than the foam inside. The foam will start to chemically break down, even if there is little or no sign of external damage. Once the foam starts the process of breakdown, it will continue each time a hot light is compressed into the head pad. (Similar to how previously burned wood will catch fire more easily than wood that has not been burned.)



## Don't dock seals come with fire-retardant foam and fabric to prevent this?

No, not as standard. Typical dock seals may be sold with optional *fire retardant* foam and/or fabric. This does NOT make the dock seal fire-proof. Only *fire resistant* materials can prevent a fire from occurring.

Fire resistant means the material will not ignite, even at extreme temperatures. Technology does not exist today to make standard dock seal foam and fabric materials fire resistant. They can, however, be made fire retardant. Using Federal Standard 191A, method 5903, additives such as hydrated aluminum or antimony oxide, can be added to the foam and fabrics during manufacturing to give them fire retardant qualities. When heated, these chemicals liberate water. By definition, fire retardant materials must be able to extinguish themselves within 10 seconds after being exposed to a flame. This means they must actually begin burning first in order to work.

The only *fire resistant* dock sealing product available is the Frommelt® Firefighter™ header seal.

## Why is the Firefighter product different?

The Frommelt Firefighter headpad technology goes one step further than fire retardance. By limiting the temperature that can build up from a marker light to less than 400°F, ignition of a fire is prevented - negating the need for fire retardant materials, and preventing the extent of damage that even fire retardant components can sustain. This is accomplished by the inclusion of a triple layer of heat dissipating and reflective reinforced foil between the fabric cover and the foam core of the headpad. This material serves two purposes: First, it acts as a reflective barrier between the fabric and foam, insulating the vulnerable foam from the heat source - the marker light. Second, the conductive metal surface of the foil conducts heat generated from the light laterally across the face of the headpad, greatly dissipating the heat buildup at the point of contact between the light and the fabric. This serves to protect the fabric from melting through. (Under severe conditions, the fabric may be temporarily softened by heat, but will not melt through - a faint impression of the light surface may remain in the fabric.)

As a final layer of defense against fire, the foam core of the head pad is made of fire retardant foam. This is to provide an added measure of protection in the unusual event of a trailer with rear marker lights that are too hot compressing the seal. (This could be caused by a truck running its onboard alternator above 14 volts, or by a short in the light itself.)

## Will the foil work for other types of heat sources?

The foil technology is specifically designed to provide protection in situations where the heat source is a trailer light; in particular, rear marker lights. These lights were found to achieve a maximum lens temperature of about 200°F in the open air. Other heat sources on the loading dock, such as from boom arm type dock lights, are too hot for this foil technology to be effective. Firefighter dock seal pads should not be relied upon to prevent a fire from such a heat source coming into extended contact with the seal.

## Are burning dock seals a new problem?

Not really. Most dock seal manufacturers, including Frommelt, have offered fire retardant foam and fabric for years to aid in the prevention of head pad fires. Instances of dock-seal fires have likewise been documented for many years. It is only in recent years, however, that the prevalence of this danger has increased, due to enforcement of the trailer light rule and the addition of more powerful electrical systems on the supporting tractors. It was the influx of requests for a better solution from customers experiencing dock seal fires that inspired the Frommelt team to create a truly fire-resistant product.

## How big is the risk today?

It is estimated that there are over 100,000 dock positions in the U.S. currently equipped with compression-style foam dock seals with unprotected head pads. Many of these units may be nearing the end of their normal product life spans and will require replacement as companies continue to pursue effective environmental control on their loading docks. For these units, it is strongly recommended that the risk of fire be considered when evaluating the overall requirements of replacement seals. For newer units, replacement of existing head pads with fire-resistant Firefighter head pads is a cost effective way of dramatically reducing the risk of loading dock fires.



# FROMMELT<sup>®</sup> INSULATOR<sup>™</sup> SYSTEM with FIREFIGHTER<sup>™</sup> HEADER SEAL

## Cost Justification Worksheet

### POTENTIAL COSTS ASSOCIATED WITH DOCK SEAL FIRE DAMAGE

Energy loss through damaged seal (burned head pad gives less effective seal)	\$ _____
Replacement of head pad (burn marks on cover; damage to foam beneath)	\$ _____
Replacement of entire dock seal (result of fire which destroys seal)	\$ _____
Loss of dock position (during seal repair/replacement process)	\$ _____
Building repair costs (result of fire damage)	\$ _____
Cost of damaged building contents (product in staging area or beyond)	\$ _____
Cost of temporary shutdown/evacuation (in the event of a fire)	\$ _____
Loss of multiple dock positions (in days following fire)	\$ _____
Cost of trailer damage	\$ _____
Cost of trailer contents*	\$ _____
Medical costs of injured employees	\$ _____
Property and liability insurance premium increases	\$ _____
Legal and other professional fees	\$ _____
<b>TOTAL</b>	<b>\$ _____</b>

\* Industry experts have provided these estimates for the value of various single trailer loads of goods:  
Potato chips . . . . . \$ 24,300      Computer chips . . . . . \$ 2,000,000 - \$ 6,000,000  
One recent case noted the value of the trailer contents lost as a result of a dock seal fire as follows:  
Computer hardware . . . . . \$ 400,000

- Average installed cost of a Frommelt FIREFIGHTER Header Seal Replacement:

\$ \_\_\_\_\_ ROI in months = \_\_\_\_\_

- Average installed cost of a Frommelt INSULATOR Dock Sealing System with FIREFIGHTER Header Seal:

\$ \_\_\_\_\_ ROI in months = \_\_\_\_\_