



# FRP HEATING PANELS



# COAL AND MATERIAL HANDLING WINTERIZATION SYSTEMS

## FOREWORD

This brochure specifically addresses the freeze protection of coal handling systems within power plants. However, the problem is not unique to this material or type of plant, and the solution can be used with many other raw materials in many different types of processing facilities.

Please contact HTD Heat Trace, Inc to discuss how the FRP Heating Panel System may help you to eliminate your specific winterization problems.

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## INTRODUCTION

Coal presents unique conveying problems as it passes from the mine mouth to the boiler. Its inherent moisture content, combined with the rain, snow and condensation encountered during shipping and storage, causes the coal to instantaneously bond and freeze to the metal surfaces of conveying and handling equipment during winter plant operation.



This instantaneous bonding process is known as **FLASH FREEZING**.

FLASH FREEZING can result in:

- Fuel starvation to the boiler and possible unit shutdown.
- Damage to bulk handling, transfer and storage equipment.
- Decreased unloading and conveying capabilities.
- Excessive labor costs and dangerous working conditions

Previously known as the Heat Tracing Division of Cooperheat, HTD Heat Trace, Inc. has addressed this specific problem with the development of a unique surface heating system that completely *eliminates flash freezing*.

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## APPLICATION RESEARCH

The obvious answer to any freezing problem is heat, but HOW MUCH?..... and..... WHERE DO YOU APPLY IT?

HTD researched this specific application by simulating the exact conditions that exist at site. It was found that:

- Flash freezing can be prevented if the surface exposed to the moving or stored coal is maintained at or above 40° F.
  - Maintaining a steel temperature of 40°F in ambients as low as -20° F requires only moderate heat input (60 to 100 w/sq.ft)
  - There is no appreciable lateral conduction of heat across areas of steel that are not directly heated; therefore, successful freeze protection of problematic areas in a coal handling system (hoppers, transfer chutes, slide gates, etc) must involve the use of a full coverage heating system.
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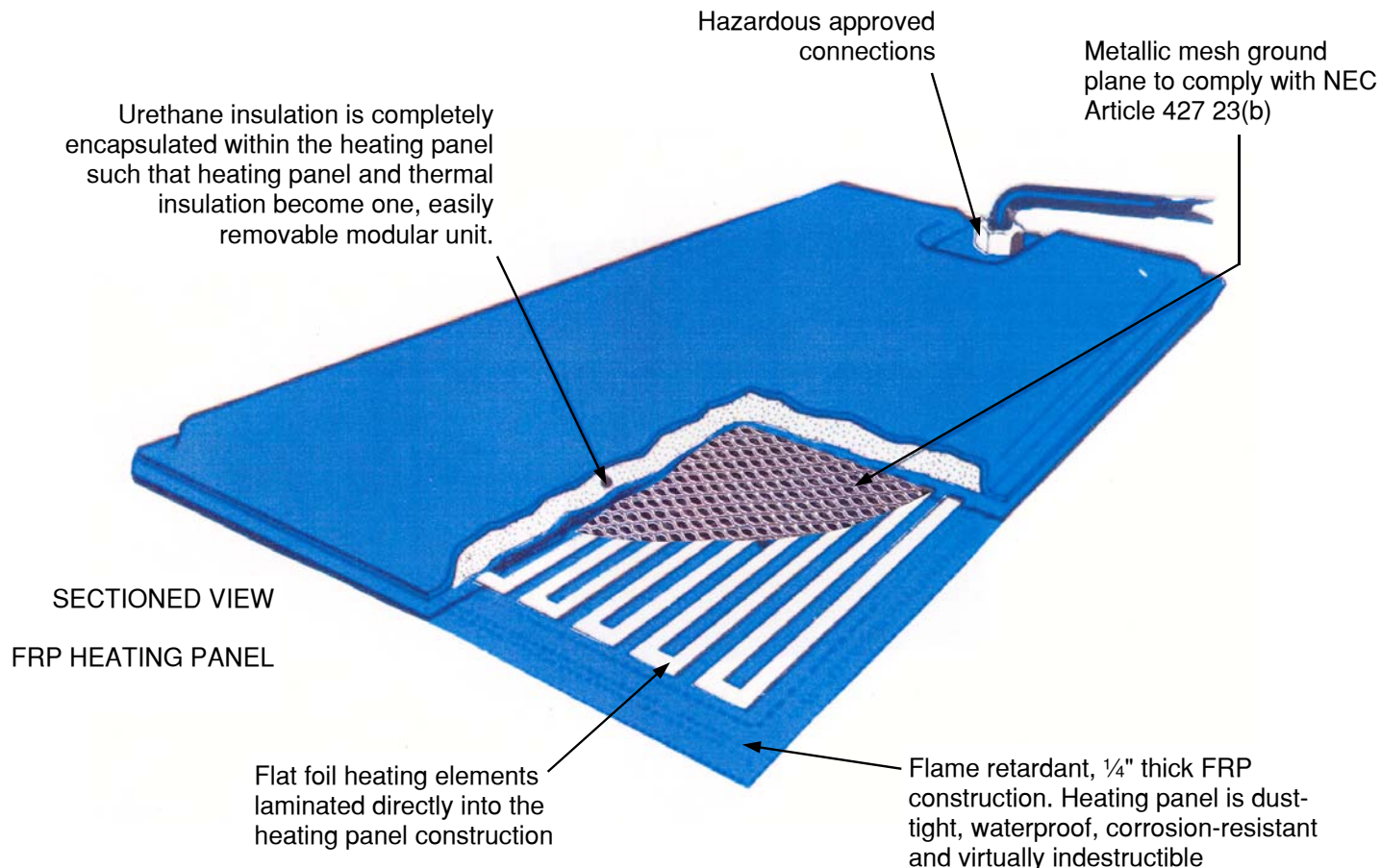
### PRODUCT DEVELOPMENT

Over and above the technical requirements, HTD also researched the actual field requirements by discussing the problem with numerous operators of coal handling systems. From this investigation the following requirements were established:

- The heater must be extremely robust, vibration proof, dust-tight and completely waterproof.
- The heater must be manufacturable in irregular shapes and sizes to fit the myriad of areas to be heated throughout the handling system.
- All electrical equipment, especially the actual heater, must be approved for use in hazardous areas as defined by the National Electric Code.
- The heater must be designed for simple installation, removal and quick re-installation due to the frequent maintenance attention required on most handling systems.
- Thermal insulation and heater must be built as one modular unit to minimize installation and removal costs.

From this information and research Cooperheat, now renamed as HTD Heat Trace, Inc. developed the **FRP Coal Handling Winterization System**.

### THE PRODUCT



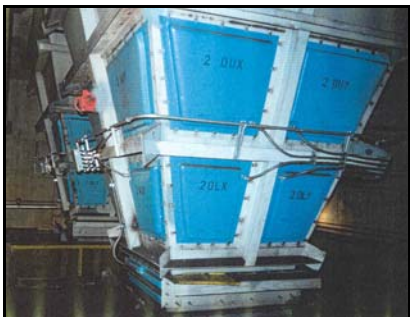
### FRP HEATING PANEL FEATURES



#### INSTALLATION EXAMPLE

MODULAR HEATING PANEL WITH BUILT IN THERMAL INSULATION CLIPPED DIRECTLY TO THE FACE OF A COAL TRANSFER CHUTE. EACH CLIP SWIVELS TO PERMIT IMMEDIATE REMOVAL OF THE HEATING PANEL.

### THE SYSTEM



#### FULL COVERAGE EXAMPLE

TRAPEZOIDAL HEATING PANELS ARE USED TO REACH INTO THE CORNERS ON EACH FACE OF THIS MAIN DISCHARGE HOPPER.

To address the essential application and field requirements discussed earlier in this brochure, the FRP Heating Panel incorporates the following features:

- The FRP Heating Panel uses a low watt density, flat foil heating element to supply the exact power ratings needed to prevent flash freezing.
- Full coverage FRP Heating Panels can be manufactured in any shape or size and in flat or curved form to fit the exact area being heated.
- The FRP Heating Panel is also dust-tight, vibration-proof and completely waterproof. The laminated construction is extremely strong, corrosion-resistant, and does not burn or support combustion.
- FRP Heating Panels are Factory Mutual Approved for use in hazardous and unclassified (non hazardous) areas.
- FRP Heating Panels are lightweight, simple to install and equally as simple to remove and re-install.
- Every FRP Heating Panel is built as a modular unit, that incorporates its own thermal insulation encapsulated within the construction. This design allows plant personnel to remove and re-apply heaters and insulation at the same time such that emergency or routine maintenance can be performed on the coal handling system with minimum inconvenience and cost.

HTD offers a "**complete engineered system approach**" for all Coal Handling Winterization applications.

- Heating Panels are custom sized from your drawings or field measured to provide the essential FULL COVERAGE HEATING SYSTEM.
- Systems are designed for operation on standard plant voltages, no special transformers or electrical hook-ups are needed
- Each system is supplied with a Control Package that will automatically switch on the system based upon the prevailing climatic conditions at site.
- Engineering drawings, schematics and Operation and Maintenance Manuals are supplied with every system.

### APPROVALS



M.S.H.A.

FRP Heating Panels are M.S.H.A. Accepted and third party approved by FM (previously known as Factory Mutual) for the use in the following areas:

Unclassified areas  
Class I, Division 2, Groups C & D  
Class II, Divisions 1 & 2, Groups F & G  
Class III, Divisions 1 & 2



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