



**HAZARD CONTROL TECHNOLOGIES, INC.**  
FIRE, VAPOR, AND CONTAMINATION CONTROL SOLUTIONS

## The Power Industry Depends On F-500 Encapsulator Agent

F-500 Encapsulator Agent is a versatile agent used for firefighting and spill control, but as an encapsulator agent, it has some interesting properties that make it particularly valuable to the Power Industry.



### Sub-Bituminous Coal

To reduce emissions, the last decade has shown a trend towards sub-bituminous coals. These coals are volatile and rapidly oxidize, frequently resulting in spontaneous combustion. Dealing with these fires has proven to be challenging and dangerous. Foam forms a blanket on the coal, but there is enough oxygen in a pile of coal to sustain the fire. Water stirs up the combustible coal dust, causing dangerous flare-ups. In confined spaces, the flare-ups can lead to explosions.



Extinguishing coal stockpile with F-500 EA Piercing Rod

After several successful emergency situations, PRB Coal Users' Group realized the value of F-500 EA for fighting coal fires and has since written "F-500 Encapsulator Agent" into their *Coal Bunker, Hopper and Silo Fire Protection Guidelines* as the recommended agent.

As an encapsulator agent, F-500 EA, mixed with water reduces the surface tension of the water, giving F-500 EA the ability to penetrate up to 15 feet into the coal. Beyond that, in the case of a deep-seated silo or stockpile fire, a piercing rod can be used to deliver the F-500 EA to a targeted area. Secondly, F-500 EA encapsulates the coal dust that is stirred up, preventing flare-ups. Finally, F-500 EA rapidly cools the fuel and surrounding surfaces. If you remove the heat, you remove the fire.



F-500 EA 2.5-gallon Fire Extinguishers



F-500 EA Piercing Rods for Deep-seated Fires



F-500 EA 26 or 40-gallon Portable Carts



F-500 EA Handy Pack for Rapid Deployment



F-500 EA Rapid Response Trailers

F-500 Encapsulator Agent has proven to be indispensable around the coal handling system. A well equipped power plant will have F-500 EA fire extinguishers, piercing rods, portable carts, Handy Packs and even F-500 EA Rapid Response Trailers at-the-ready for any coal handling event.

### Under Turbine Lube Oil

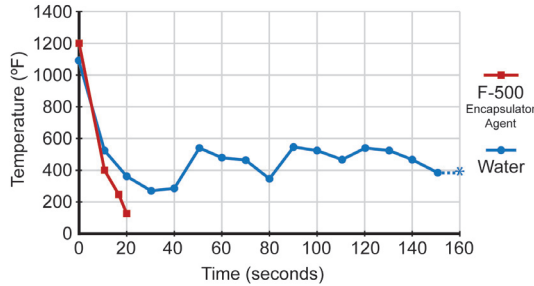
The large amounts of hot oil lubricating turbine bearings is circulated through an intricate system of pipes, filters, centrifuges, pumps and connectors. Over time, heat and vibration can cause leaks at any point. The hot oil and high surface temperatures can quickly result in a large fire. FM Global testing has found these fires exceed 1,500°F thirty feet above the turbines; hot enough to destroy not only the turbine, but the structural integrity of the entire building.

Water has been used through fixed suppression systems for turbine protection, but water is ineffective against Class B fires and can only provide some cooling. At 1,500°F, most of the water will evaporate before reaching the source of the fire. Foam can suppress the fire, mostly on horizontal

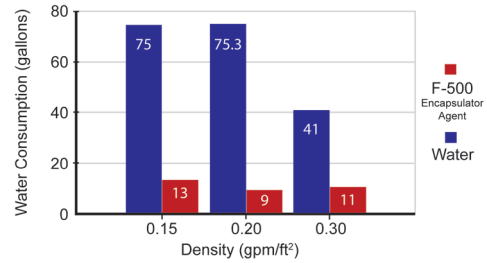


surfaces but is not effective on three-dimensional fires, like turbines. In fact, NFPA 11, Annex A.1.1. states, "Foam is not suitable for three-dimensional flowing liquid fuel fires or for gas fires."

F-500 EA is well-suited for turbine fires because it is a three-dimensional firefighting agent. It actually extinguishes the fire three ways. It encapsulates the oil, rendering it nonflammable. It rapidly cools the oil and surrounding metal and it interrupts the free radical chain reaction, resulting in fast knockdown.



Testing shows F-500 EA reduced the temperature to 100°F in 20 seconds. Water did not extinguish the fire during this test.



In all three tests, considerably less water was required with F-500 EA.

Independent testing by a major power company proved F-500 EA used at 3% can extinguish a Class B fire at .15 gpm/ft² application density, faster than water can at extinguish the same fire at .30 gpm/ft². Also, compared to water alone, F-500 EA used up to 83% less water to extinguish the same Class B fire.

## Transformer Fires

During a well documented transformer fire in New York City in 2009, FDNY applied foam for over two hours, attempting to keep the fire from spreading. After that time, the power was turned off and two handlines applied Purple K. Since Purple K doesn't cool, the fire kept igniting. F-500 EA was applied and extinguished the fire in less than two minutes. They continued to cool the transformer with F-500 EA until the temperature was 100-120°F.

After this incident, ConEdison began extensive testing of agents on energized transformers. Ultimately, they learned F-500 EA was the only agent capable of being applied to an energized transformer up to 345,000 volts with imperceptible electrical feedback to the nozzle.



ConEdison monitors FDNY progress at transformer fire.



FDNY assist ConEdison testing F-500 EA applied to a 345,000 volt transformer.

Like turbines, transformers are a three-dimensional fire with extreme heat and Class B oil. F-500 EA is exceptional at extinguishing these fires by encapsulating the oil, cooling the oil and transformer and quickly reducing the black smoke. Also, after the ConEdison testing, we learned F-500 EA can be applied as soon as firefighters arrive on scene, streaming from 125 feet. There's no need to wait hours for the power to be turned off.

Like transformers, F-500 EA can also be applied using a Concentrate Control Supply (CCS) system. CCS systems can be added to new fixed suppression installations or to upgrade existing systems. The addition of F-500 EA greatly enhances the firefighting capability of any suppression system.

Hazard Control Technologies products are designed, developed and manufactured in compliance with ISO 9001. Certification of this compliance is issued by International Quality Registrars.



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