

Concentrate Control Supply Systems



Hazard Control Technologies, Inc.

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Hazard Control Technologies provides fire suppression solutions with our Concentrate Control Supply (CCS) Systems. Whether you are adding a new suppression system or upgrading an existing system, CCS Systems can improve your system's extinguishing capabilities and possibly reduce project costs due to the superior firefighting capabilities of F-500 Encapsulator Agent (EA). F-500 EA can convert your system from simple fire control to a rapid extinguishment system. Although we recommend F-500 EA, these systems can be configured to add our Pinnacle foams. If your goal is dust control, our Dust Wash solution is the agent of choice for dust mitigation.

CCS Systems are both powered and non-powered and are designed to enhance a new or existing fire suppression system. Each system is custom engineered and easily integrates with new system designs or an existing system.

CCS System Configurations

Bladder Tank System

The typical bladder tank system includes a bladder tank from 36 to 12,000 gallons that easily connects to the fixed suppression delivery system. A ratio controller proportions the predetermined amount of F-500 EA or foam and a hydraulic ball valve actuates the release of the suppression agent into the water stream. Bladder tank systems are commonly used for fire control for specific applications, such as coal silos, transformers or turbines.



Bladder Tank System



Balanced Pressure Pump System

Balanced Pressure Pump System

In larger applications where the discharge outlets for a hazard could be singular or multiple, a Balanced Pressure Pump System will insure the agent is accurately proportioned based on the water flow and pressure. The system constantly monitors the pressure of the concentrate and water lines, and balances both lines to allow for proper proportioning. This type of system is excellent for warehouses and Class B fuel applications, such as hydrocarbon storage tanks or truck loading racks.

Water Driven Proportioner System

The system is powered by water pressure and requires no external power. These systems can provide predetermined proportioning over a wide range of flows. Water driven proportioners can be used for larger systems and pumps can be added to maintain the required water pressure throughout the system. They can be used on almost any application.



Water Driven Proportioner System

CCS Applications

Hazard Control Technologies (HCT) is a recognized fire protection expert offering fire suppression delivery systems for various applications. HCT's custom-designed Concentrate Control Supply (CCS) systems enhance the safety of personnel and facility assets. CCS systems reliably proportion F-500 Encapsulator Agent, Pinnacle Class A, AFFF or AR-AFFF foams or Dust Wash. From design and installation to final commissioning and certification, HCT works with all parties to ensure the fire protection system is installed properly and is functioning and proportioning as designed. We provide training for on-site personnel to ensure they understand the operation and maintenance requirements of this critical fire protection system. HCT also provides annual testing and recertification to conform to national fire codes.

Typical examples of CCS applications include:

- Coal Handling and Housekeeping
- Storage Tank Protection
- Truck Loading Rack Protection
- Turbine Under Deck
- Cooling Towers
- Warehousing
- Combustible Granular Control
- Floating Roof Suppression Systems
- High Expansion Foam Systems
- Transformers
- Mill Inerting
- Rubber Storage and Shredding
- Aircraft Hangar Protection
- Vapor Suppression and Mitigation
- Dust Collectors
- Boiler Fronts
- Conveying Systems
- Pulp and Paper Mills

When HCT's Concentrate Control Supply (CCS) systems are used with F-500 Encapsulator Agent, the fire suppression capabilities of any fixed suppression system become greatly enhanced. This becomes most apparent when CCS is applied to situations where water is simply ineffective. Examples include combustible bulk solids, where a CCS system can prevent these volatile granulars from accumulating and igniting from conveyor belt friction or spontaneous combustion. These granulars and powders include sub-bituminous coal, saw dust, wood chips, rubber crumb, sugar, flour and similar materials prone to spontaneous combustion. Another excellent area for F-500 EA CCS systems is three-dimensional fires, such as the piping and vessels in a refinery, or tire storage. NFPA 11 states, "Foam is not suitable for three-dimensional flowing liquid fuel fires or for gas fires." F-500 EA does an excellent job of cooling, encapsulating and extinguishing these fires. Finally, the third area where F-500 EA excels is hydrocarbons. F-500 EA encapsulates the fuel and renders it nonflammable. Under turbine lube oil in power plants or oil drums in a warehouse are examples.

F-500 Encapsulator Agent

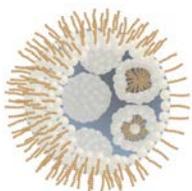
- Rapidly cools the fuel and surrounding structure
- Encapsulates the fuel and vapors
- Reduces surface tension for better penetration
- Interrupts the free radical chain reaction
- Nontoxic, noncorrosive and 100% biodegradable



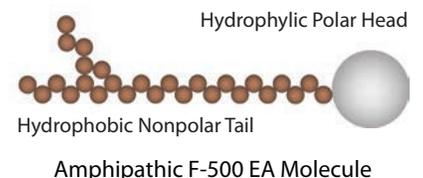
How Does F-500 Encapsulator Agent Work?

F-500 EA is an Encapsulator Agent. The F-500 EA molecule is a large, amphipathic molecule, meaning its ends act independently. One end is a hydrophilic polar head which attaches to water and the other end is a hydrophobic nonpolar tail, that is repelled by water and seeks hydrocarbon molecules.

When you mix F-500 EA with water, the F-500 EA polar heads attach to the water droplets. Heat from the fire is drawn down the nonpolar tails into the water droplets. The heat is absorbed, unlike plain water which will release the energy as dangerous steam. F-500 EA's cooling ability is truly remarkable, absorbing as much as 6-10 times more heat than plain water. The nonpolar tails protrude from the droplets and attach to hydrocarbon liquids or vapors, completely enveloping them and forming "micelles" or cocoons. The protective shells around the hydrocarbon molecules renders the fuel nonflammable.



F-500 EA Surrounds Water Droplets



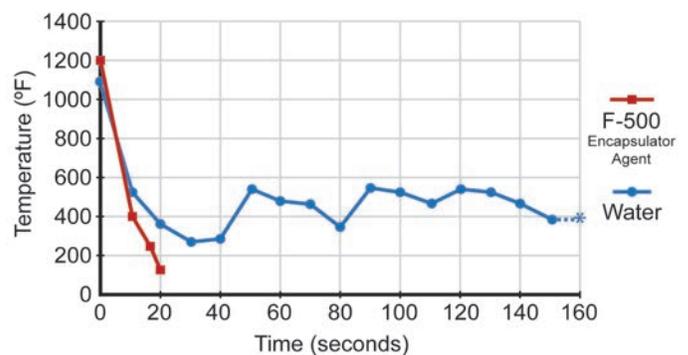
Fire Suppression Testing - F-500 EA vs. Water

For a turbine lube oil application, FM Global fire suppression system testing proved the current NFPA recommendation of .30 gpm/ft² was inadequate. They now recommend .40 gpm/ft². A large east coast power company experienced a fire and had to enhance their fire suppression system. They wanted to determine if they could increase their performance by using fire suppression additives instead of redesigning their entire system with greater discharge densities at great expense. They began extensive testing with plain water and water with 3% F-500 EA added. Using diesel fuel, the tests were run at four discharge densities and two burn scenarios. Each test was performed independently and the results were recorded.



This chart was created based on the data from one of the 4 x 4 ft pan diesel fuel burn tests at a .15 gpm/ft² discharge density comparing F-500 EA to plain water.

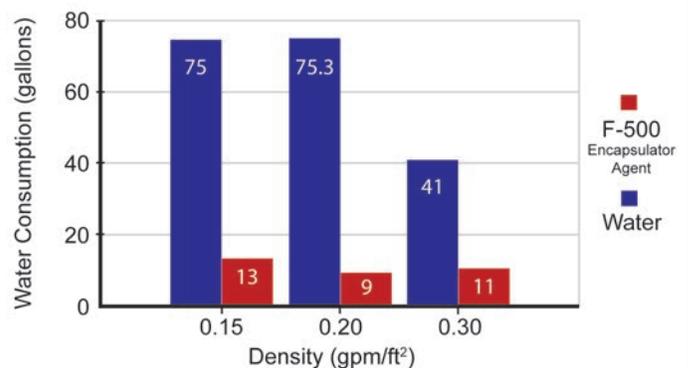
As you can see, the F-500 EA cools the diesel fuel rapidly, from 1200 to 115°F in seconds. Plain water cools at first but the temperature keeps increasing above autoignition levels, which is 410°F for diesel fuel. This is why the test continued for so long. With F-500, there is no need to be concerned about reignition, because the temperature drops permanently; remove the heat, remove the fire.



This chart combines several 4 x 4 ft pan tests at various discharge densities comparing F-500 EA to plain water and the amount of water needed to extinguish the diesel fuel.

As you can see, adding just 3% F-500 EA to water utilizes as much as 83% less water to extinguish the same fire.

After the testing, it was concluded that not only was there no need to redesign their current fire suppression system, but by simply adding HCT's Concentrate Control Supply system, they could use their current piping and nozzles and exceed the performance of plain water at .40 gpm/ft² discharge density.



Hazard Control Technologies products are designed, developed and manufactured in compliance with ISO 9001:2000. Certification of this compliance is issued by FM Approvals.

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