



# Introduction to F-500 EA<sup>®</sup>





# MECHANICS

## HOW DOES AN F-500 EA® MOLECULE BEHAVE IN SOLUTION?

F-500 Encapsulator Agent starts as a large amphipathic molecule, containing both a hydrophilic polar head and hydrophobic non-polar tail that act independently. When mixed with water, these molecules will instantly form billions of micro spherical micelles as non-polar tails turn inward, avoiding water at all costs. Encapsulator Agents immediately reduce the surface tension of water. This makes droplets smaller, creating more surface area to rapidly absorb heat and better penetrate the pores of solid material.

### EXPLORING

## ENCAPSULATOR TECHNOLOGY (ET)

Today's fires are burning hotter and faster than ever before. We are faced with new and highly hazardous materials every day. So, why are many fire departments and industry leaders fighting today's fires with yesterday's technology? Encapsulator Agents, like F-500 EA®, are a type of water additive whose basic building blocks are spherical micelles. While foam mechanically separates fuel from oxygen, F-500 EA® works on a molecular level, altering the chemical makeup of water droplets and providing several advantages.

### HEAD



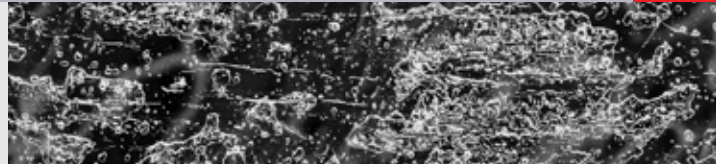
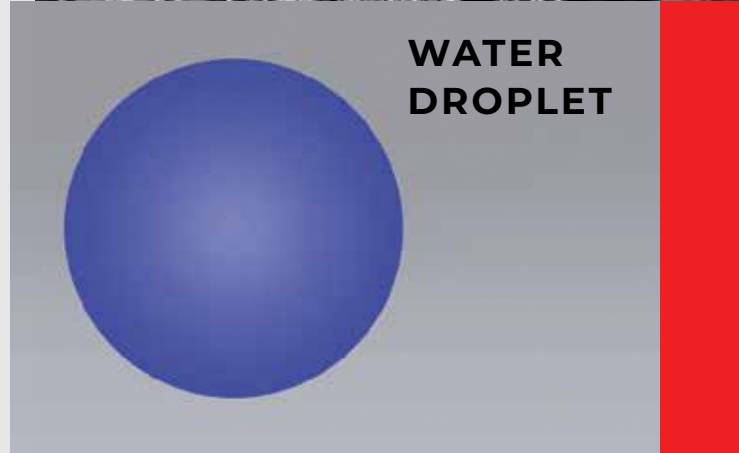
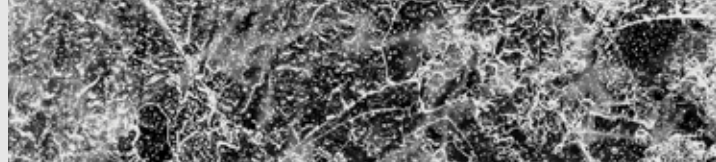
### TAIL

### HAZARD CONTROL TECHNOLOGIES

## EXPLORING

# VERSATILITY

As spherical micelles leave the nozzle, non-polar tails nearest to the surface turn outward, forming a protective “skin” around the outside of each droplet. This happens instantly, leaving a multitude of spherical micelles within the droplet. This is important for several reasons. This changes the molecular weight of a droplet, enabling the Encapsulator Agent molecule to absorb significantly more heat than a water molecule. This absorbed heat is then transferred from the outer tails into the core of each spherical micelle. A water molecule lacks this layer and the ability to efficiently transfer heat, generating a surplus of scalding steam. This allows Encapsulator Agents to safely and effectively extinguish a vast variety of fires that plain water cannot.



**CLASS A MATERIALS**

**0.5% – 1%**



**CLASS B FUELS [POLAR + NON-POLAR]**

**3%**



**ENERGIZED ENVIRONMENTS**

**3%**



**CLASS D METALS**

**3%**



**LITHIUM-ION BATTERIES**

**3%**

**HAZARD CONTROL TECHNOLOGIES**

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## UNIQUE FEATURES

**SPECIAL CHARACTERISTICS  
CONTRIBUTING TO THE ADVANCED  
EFFECTIVENESS OF F-500 EA®**



1

### **ENCAPSULATION**

Encapsulation of polar and non-polar fuels provided by F-500 EA® reduces the risk of re-ignition in the form of stable and long-term burn back resistance.

2

### **RAPID HEAT REDUCTION**

F-500 EA® molecules form an outer layer of agent on each droplet. This drives heat internally where micro spherical micelles rapidly absorb thermal energy.

3

### **FREE RADICAL INTERRUPTION**

F-500 EA® proactively reduces the concentration of harmful hydrocarbons present in smoke and soot by interrupting the free radical chain reaction.

4

### **ECO-FRIENDLY**

F-500 EA® is a fluorine free, noncorrosive, and biodegradable solution capable of extinguishing three-dimensional multi-class hazards.

**HAZARD CONTROL TECHNOLOGIES**

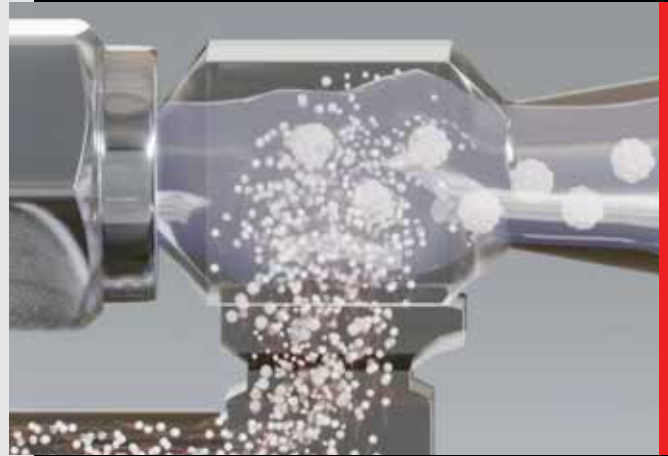
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## EXPLORING

# FIRE PROTECTION

The four unique features of F-500 EA® offer countless benefits for both fire suppression and flammable spill control applications.

**TESTING SHOWS THAT EVEN A 1% SOLUTION OF F-500 EA® CAN DRASTICALLY REDUCE THE AMOUNT OF WATER NEEDED TO EXTINGUISH A FIRE**



BENEFIT	EA	WATER	FFF
STABLE BURN BACK RESISTANCE	✓	✗	✗
ADVANCED COOLING	✓	✗	✗
RAPID KNOCKDOWN	✓	✗	✗
INCREASED VISIBILITY	✓	✗	✗
SMOKE + SOOT REDUCTION	✓	✗	✗
CARCINOGEN REDUCTION	✓	✗	✗
SCALDING STEAM ELIMINATION	✓	✗	✗
MINIMIZED RUNOFF	✓	✗	✗

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**NFPA 18A**

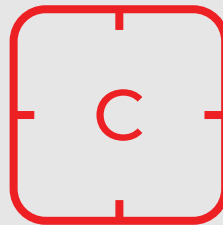
## **ENCAPSULATOR AGENTS (EA)**

### **SECTION 7.7**

This section covers the test procedure to evaluate the ability of a water additive solution to form and maintain stable spherical micelles capable of encapsulating combustible and flammable liquids (polar and non-polar), rendering the flammable liquids non-flammable, non-ignitable, and non-explosive and maintaining that encapsulation in the presence of high heat over an extended period of time.

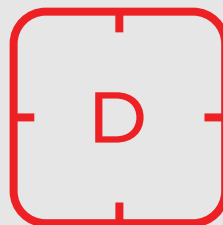
### **SPHERICAL MICELLE STABILITY**

## **NFPA STANDARDS**



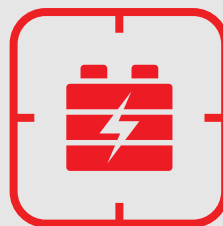
### **CH 8 SEC 8.1**

Standardized testing guidelines for hazards in energized environments.



### **CH 9 SEC 9.1**

Standardized testing guidelines for combustible metal hazards.

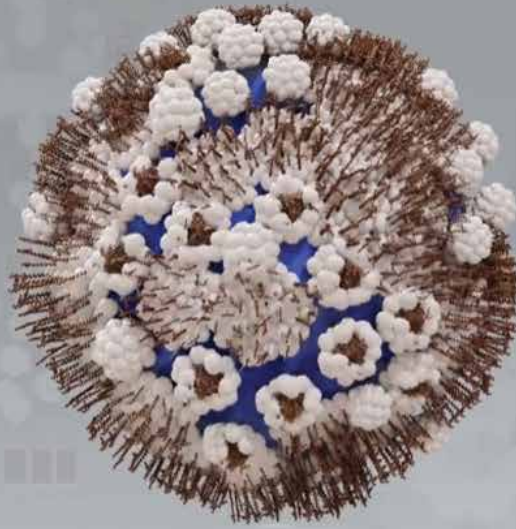


### **ANX 4.3**

Third-party testing for Encapsulator Agents on lithium-ion hazards.

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**EXPLORING**  
**EQUIPMENT**  
**& FIXED SYSTEMS**



<b>FIRE EXTINGUISHER</b>	<b>2.5 G</b>
<b>TKO NOZZLE</b>	<b>20 GPM</b>
<b>QAMU</b>	<b>6.5 G / 13 G / 19.5 G / 26 G</b>
<b>CART / SKID / TRAILER</b>	<b>VARIOUS</b>
<b>DIAMOND DOSER</b>	<b>CUSTOM</b>



**POWERED BY F-500 EA®**

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