



EV-EXBOX

Encapsulation Agent Vs AFFF Foam

The Encapsulator Agent was originally designed for liquid fuel spills. It was designed to encapsulate hydrocarbons and render them non-flammable. Over time, additional properties of the ENCAPSULATION AGENT revealed it to be more than a spill control agent.

In addition to encapsulating fuel, the ENCAPSULATION AGENT had an amazing ability to cool. Independent testing proved it also interrupted the free radical chain reaction, meaning it reduced smoke and toxins, increasing visibility during firefighting.

The ENCAPSULATION AGENT removed the scalding steam generated when applying water or foam to a fire and it could be applied to three-dimensional fires, Class A, Class B polar or nonpolar, Class D and even some Class C fires. Many industrial and municipal firefighters found the ENCAPSULATION AGENT to be far superior to foam on most fires. So, the ENCAPSULATION AGENT became a firefighting agent.

Ultimately, the ENCAPSULATION AGENT ability to encapsulate fuel is the root of its other capabilities. So, how does it do this?

The ENCAPSULATION AGENT EA molecule is a large, amphipathic molecule with a polar head and a nonpolar tail. The head is attracted to water and the tail is attracted to hydrocarbons. In a sufficient quantity of water, the nonpolar tails attach to hydrocarbon molecules forming micelles, or protective "chemical cocoons." These micelles prevent the hydrocarbons from vaporization, so there is no ignition. A simple formula of 40 parts of water and 1 part of the ENCAPSULATION AGENT will neutralize 8 parts of hydrocarbon.

An example would be a fuel spill on the highway of 300 litres of E10 ethanol-blended gasoline. The firefighter needs to apply 150 litres of water and 4 litres of the ENCAPSULATION AGENT .

Applying the ENCAPSULATION AGENT at 3% with a 125 gpm nozzle, the firefighter can spray the spilled fuel for 20 seconds. He will have applied over 4 litres of the ENCAPSULATION AGENT and over 150 litres of water. The spill will be completely neutralized.

Foam however does not encapsulate. To make the spill safe, it must form a perfect blanket to starve the fuel of oxygen. If there was a fire, the fuel will remain hot, possibly above autoignition temperatures. The foam will blanket in the heat.

NFPA 11 (5.8.2.2) states AFFF or AR-AFFF must be applied for a minimum of 15 minutes to a non diked hydrocarbon spill since the fuel remains hot. Applying foam at 0.10 gpm/ft² for 15 minutes, as specified by NFPA 11, will require 134 litres of AFFF and 4,500 litres of water. **

It is important to consider that less ENCAPSULATION AGENT is required vs AFFF foam. This is important for storage, handling and means far less water is required to extinguish a fire.

This is why the dilution rates need to be compared carefully with AFFF foam when any price comparison is made between the ENCAPSULATION AGENT and AFFF foam, you cannot simply compare them like for like per litre.

**** From the example given you will see that 135 litres of foam is required to undertake the same effect as 5 litres of ENCAPSULATION AGENT.**

When firefighting a non-liquid fuel fire, the ENCAPSULATION AGENT only needs to extinguish the fire. The less water and agent used, the better. Foam needs to form a blanket across the entire surface of the vessel. Then, it traps in the heat, so the blanket of foam must be perfectly maintained, or reignition occurs.

For fuel tank fires, their intense heat makes applying foam difficult, as the water superheats and evaporates and the foam bubbles rise into the air from the heat. Many times, it is considered a success if the vessel completely burns out, just so the fire did not spread to other vessels whereas the ENCAPSULATION AGENT can trap fuel and vapours to extinguish the fire and cool the vessel.

Foam must completely separate the fuel from the oxygen. That is one element of the fire tetrahedron. The ENCAPSULATION AGENT works on three elements of the fire tetrahedron.

First, it rapidly cools the fuel and surrounding vessel – remove the heat; remove the fire.

Secondly, the ENCAPSULATION AGENT encapsulates the hydrocarbon vapours and liquid on the surface of the vessel rendering them non-flammables and nonignitable.

Finally, the ENCAPSULATION AGENT interrupts the free radical chain reaction, which are unburned gases from the combustion process. Removing these free radicals reduces toxic smoke.

The ability of the ENCAPSULATION AGENT molecules to surround water drops prevents them from evaporating as steam, allowing them to absorb 6-10 times more heat energy than water.

From an environmental perspective the ENCAPSULATION AGENT does not contain any PFA / PFOS fluorides. We are recommending the ENCAPSULATION AGENT as the best product not only for lithium ion battery fires but also as a direct replacement for AFFF foam completely in terms of cost, efficiency and environmental protection.