Combat Support Products
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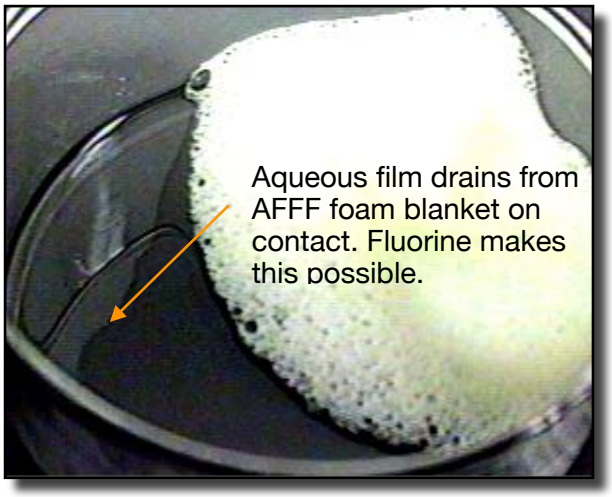
September 7th 2018
rev. 10/31/18

Foam Seminar Handout - Middlesex County NJ - Annual Foam Tech II Training - Environmental Update - Future of AFFF Foam.

Yes, Mike, there is something to AFFF water contaminants being linked to cancer.

Aqueous Film Forming concentrates (AFFF's) have had for many years two of perhaps 3000 possible PFAS compounds, particularly PFOS/PFOA which were the backbone chemistry component of film forming firefighting foams until the turn of the century. Since then, those cancer linked *electrochemically produced fluorosurfactants* have been found in ground water, mainly near military training sites. To be clear, modern Mil Spec, C-6 telomer formulations are not the same in terms of health hazard nor are they being trained with.

As a result of these discoveries, U.S. EPA required the industry to move to a non-biocumulative, C-6, (telemor based) AFFF fluorosurfactant. C-6 AFFF's are however, environmentally persistent, although to a much lesser degree than the older C-8 chemistry. Still, there can be an environmental impact where, in the unlikely event, thousands of gallons of AFFF concentrate are used at a single, large fire or spill event.



New York's Regulation
As of 2017, New York State DEC regulation 6 NYCRR Part 597 have a reportable limit on the use of AFFF containing PFOS / PFOA is law.

Put in perspective: in order to reach N.Y.'s RQ one would need to deliver 120,000 gallons of AFFF concentrate or apply 4,000,000 gallons of 3% foam water solution at a single fire event.

The average fire dept. run to a liquid spill or spill fire is not likely to use more than 50 gallons of class B foam concentrate. Very large transport spill fires may use on the order of 100 to 200 gallons.

F-III or F-3 (Fluorine Free Foams) could be in our future: The state of Washington has banned fire dept. use


HazMat spill management using medium expansion F3 @ 30:1.

of fluorinated firefighting agents (AFFF's) as a result of citizens contracting cancer from well water containing PFOS/PFOA near military training facilities.

Some European entities and one Australian state have banned fluorosurfactant firefighting agents. and there is a strong possibility the petrochemical industry (refining, processing and storage facilities) are considering switching to F-3 firefighting agents in the future.

If the State of New Jersey or any other state follows Washington's environmental lead, the industry will accommodate with various fluorine free (F-3) replacements: some good, some not so good. Some U.L. listed, some not.

At this time F3 foams are not as robust as modern C-6, 1x3% AR-AFFF's in terms of U.L. listings, application rates, Coast Guard or U.S. military and FAA approvals.

As for fire service training … fortunately, training now-a-days is, for the most part, done with hydrocarbon surfactants (no fluorine) surrogates such as Knockdown training foam or a 20:1 water/diluted Knockdown Class A foam.

http://www.cottrellassociates.com/combat-support-products/ewExternalFiles/Training%20Foam2.pdf

Disposal of obsolete AFFF's - Fire department AFFF inventories with production date codes before 2002 should be evaluated and may well need to taken out of service. Disposing of obsolete AFFF should be via incineration. Contact us for legacy foam disposal advice.

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Be particularly suspicious of any AFFF or AR-AFFF produced before 2002. Foams of this vintage are likely to contain electrochemical (PFOS/PFOA) fluorosurfactants. This does not now, nor has it ever applied to National Foam's products.

F-3 Points Worth Sharing:

* It is critical that F3 foams be applied at a 7 to 10:1 expansion ratio, which eliminates its use with spray nozzles unless with an aerator attachment that produce U.L foam quality. Not a serious issue because we are already there with AR-AFFF's when going after alcohols or ethanol /gasoline blends. Foam stream reach is likely to be reduced with full aerating devices and will surely be a safety/distance issue.

* As we know, when using AFFF or AR-AFFF, film formation is only likely to be an advantage where fuel has depth such as on a pooled spill fire, storage tank fires or where fuel is

floating on water. Otherwise, fuel soaked into highway medians, rail ballast, sand or roadside turf is only going to respond to aerated foam, be it AFFF or not. In such applications F3 foams should very effective.

* Application rate for hydrocarbon **spill fires** to include gasoline/ethanol (E-10) are likely to be 60% greater using F3 foams. (0.16 gpm per sq. ft. or higher as opposed to 0.10 gpm per sq. ft. for spill fires using AFFF). Dan and I will be testing E-15 and E-85 later in the year. Where U.L. listings go on these gasoline blends remain to be seen. I'm on the U.L.162 Tech Committee and are now debating how to approach the listing process using F3 foams on fuels other than their standard, heptane.

* U.L. listed and Mil. Spec AFFF and AR-AFFF can be plunged (forcefully applied) into hydrocarbon fuels because their modern C-6 fluorosurfactant chemistry is very fuel tolerant and resists mixing with hydrocarbon fuels such as: RBOB gasoline home fuel oil, diesel and Jet A. This is NOT the case with alcohol or some alcohol blended gasolines, be they pooled or soaked into terrain.

* F3 foams will not tolerate plunging into ignited or un-ignited hydrocarbon fuel spills. Therefore, F3 foams are not candidates for subsurface (base) injection and will be particularly challenging for Type III applications at fuel storage tank fires.

* At 1% or less, most F3's have class A wetting characteristics, although may not be as foamy as class A foam. Still good for class A overhaul, rubbish and or tire fires.

* F-3's can be used for training.

Simply put: firefighting strategies and application tactics using F3 foams are same as those using AR-AFFF on polar solvents or regular protein foam as used in the early to mid 20th century.

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More info:
www.combatsupportproducts.com/combat-support-products/training-library.html