NATIONAL FOAM

Foam Lines - January 2019 rev. 3.20

Cottrell Associates, Inc. National Foam Factory
Agents Since 1988
A Division Of Combat Support Products

Proposed legislation banning PFOA (perfluoroalkyl and polyfluoroalkyl substances) in class B firefighting foams (AFFF and AR-AFFF).

Background / History

At first, environmental folks identified PFOS & PFOA fluorosurfactants used in AFFF and AR-AFFF firefighting foam as bad actors, and in most cases, rightly so. These compounds were responsible for film forming characteristics of AFFF. National Foam's AFFF products never contained any of these bad actors, so products like Universal Gold and our other range of AFFF agents were okay.

Several years ago the industry, to include military turned to modern C-6 chemistry that uses no PFOS / PFOA components. All seemed well until lately. Now it seems any and all film forming fluorosurfactants (PFAS) regardless of origin are considered bad actors. In the face of strong scientific debate there is legislation moving forward that would ban all AFFF firefighting foams be they compounded with modern C-6 components or not. Military and FAA come under federal jurisdiction and state bans are not likely to affect military firefighters and the flying public in the near term.

How It Will Likely Impact Your Fire Department

* Disuse of all AFFF or AR-AFFF regardless of chemistry origins.
* Dispose of disused agent via incineration - 1000 deg. C for two seconds
* Replace all with appropriately listed NFPA 11 (U.L.) F3 (Fluorine Free) foam.
* Training updates that include a more difficult approach to liquid fuel firefighting.
* All National Foam alcohol resistant products can be replaced by Universal Green 3% AR-F3, U.L. listed for use on hydrocarbon and polar solvents with fresh or sea water.
* Foam quality will be critical as water spray nozzles will not get us to an acceptable expansion ratio of 7 to 10:1. Need aerator attachments.
* Proportioning accuracy will be as or more critical as the fluorine components in old AFFF's were so forgiving in combat.
* Application rates and water requirements will in crease by 60% for spill fires (NFPA Type III application) and stay at 0.16 gpm/sq.ft. for tank firefighting.
* All liquid fuel fires will need to be treated in terms of application techniques as we now treat alcohol (polar solvents).
* Class A foam and UL (NFPA 18) wetting agents are not an option for gasoline/ethanol blends.
* The attached are writings I've done in anticipation of legislative bans on fire foams containing PFAS.

Regards, Jim Cottrell - jimcott@mac.com
National Foam Eastern Regional Factory Agent (Municipal Markets)

Foam Lines

June, 2018 - Jim Cottrell

Can Fluorine Free Foams (F3) Be In Your Future?

There is a good possibility the petrochemical industry (refining facilities) may switch to fluorine free firefighting (F3) agents for some applications in the coming years. As of 2020, the state of Washington will no longer allow Fire Department to use or train with AFFF, fluorinated firefighting agents. Moreover, New York State now have introduced a Senate bill banning PFOS, PFOA and four PFAS compounds in firefighting foam and turnout gear. In fact, some European entities and two Australian states have banned PFAS, firefighting agents as well. If your State or county follows these trends, National Foam is already there with a effective fluorine free (F3) replacement.

Universal Green™
Alcohol Resistant Fluorine Free Foam
Fluorine free = No intentionally added PFAS

Breakthrough:
National Foam have recently developed a fluorine free (F3) fire foam compound, **Universal F3 Green™ 3x3** which works well on polar solvents and hydrocarbons including gasoline/ethanol blends. It shows promise as a replacement for AR-AFFF for fire department use, although it is not as robust as Universal Gold,1x3% AR-AFFF in terms of U.L. listings, application rates and U.S. Coast Guard approval. However, I am quite confident in its performance as Dan and I tested it on E-10, winter grade gasoline at 3% using 11:1 expansion nozzle at 0.16 application rate and got better than expected results. In this regard, we are particularly keen on its use in non-fuming hazardous materials vapor suppression missions. Reason: it has a two plus hour quarter life at 3% where Universal Gold has 24-25 minutes in fresh water @ 3%. Universal F3 Green™, 3x3 use for long term vapor suppression events, which are the lion's share of Fire Department uses shows significant economic advantage over faster draining AR-AFFF's. Finally, since it's non-fluorinated and 100% biodegradable, you can train with it.

Universal F3 Green, 3x3; U.L. listed; ten year shelf life.
Available in pails, drums and totes.
Priced at Universal Gold C6 cost.
Now available at Natonal Foam Stocking Dealers.

Why Universal F3 Green™ 3x3 is viable: As you know, when using AFFF or AR-AFFF film formation is only likely to be advantageous where fuel has depth such as on a pooled spill fire, in storage tanks 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 fluorinated AFFF or not.

C-6 AFFF and C-6 AR-AFFF are tolerant of fuels such as: RBOB gasoline home fuel oil, diesel and Jet A and is why base injection and or over the top applications at storage tank fires is possible. This is NOT the case with alcohol storage tanks or alcohol blended gasolines, be they pooled or soaked into terrain.

Since **Universal F3 Green™** 3x3 does not contain fluorosurfactants it requires non-plunging application techniques using aerating appliances, much the same as well trained fire departments do now with gasoline/ethanol fuel spills using AR-AFFFs.

Seven Points Worth Sharing:

* Must aerate **Universal F3 Green™** at least 6 to 11:1, which eliminates its use with spray nozzles unless with aerator attachments. Not a serious issue because we are already there with bank-in or bounce-off techniques when going after alcohols or ethanol / gasoline blends.

* Application rate for hydrocarbons spills to include gasoline/ethanol (E-10) are likely to be near or at 0.16 gpm per sq. ft. Where U.L. listings go on other gasoline blends remain to be seen. I'm on the U.L.162 Standard Technical Panel and are now debating how to approach the listing process using F3 foams on fuels other than standard heptane, in particular, gasoline/ethanol blends.

* F3 foams are not candidates for plunging into ignited hydrocarbon fuel spills. Therefore, application techniques, appliances and stream reach need to be re-evaluated and retrained. I'm thinking application techniques and finished foam quality will be very important going forward. As always, Dan, Steve or I will be available for Train The Trainer booster shots. We have a couple other instructor candidates we are getting up to speed for such training initiatives and may well be available by end of summer 2018.

* Viscosity is similar to AR-AFFF, although not as viscous as Universal Gold. **Universal F3 Green™** 3x3 is a self-thinning, non-newtonian liquid; the faster it moves the thinner it gets. Our preliminary tests show it to be 1700 cps. It is easily proportioned with foam eductors, jet pumps, around the pump proportioners, balanced pressure systems and direct injection systems such as FoamPro® 3000 series. Use with FoamPro® 2000 series class A/B systems should not be a problem where class A system strainers are removed. Finally, It is not a candidate for booster tank premix (dump and pump).

* Class A wetting characteristics are evident at 1%, although it may not be as foamy as class A foam. Still good for class A overhaul, rubbish and or dump fires.

* [1]Universal F3 Green™ 3x3 has unusually long quarter life which gives it improved burn back resistance and vapor suppression in general. This attractive benefit causes it to be very stingy in terms of water needs and economy of use, since application frequency can be more than four times reduced compared to Universal Gold™ C-6 at 3%. This is particularly valuable where firefighters are operating on spills from a booster tank at a highway crash or where access to water is limited or nonexistent. This means that an aerated hand-line covering a spill may go close to two hours between applications at 3%, meaning A 500 gallon (1893 l) booster tank could last for hours. Foam concentrate usage will be drastically reduced as well, making it much more cost effective than any AR-AFFF and on the order of ten times more effective than C-6 airport AFFF when it comes to post fire security.

Universal Green
Alcohol Resistant Fluorine Free Foam

Long Life Example:
Lets say, on the conservative side, you get 2 hr. quarter life - Using the right 100 gpm (378 L) aerating nozzle, supplied by a 500 gallon (1892 L) booster tank; one can, in theory, go 7.5 hours or more on scene, as each one-minute application will use 97 gallons (367 L) water and three gallons (11.4L) of Universal F3 Green™ 3x3. At 120 minute application intervals one will use three, five-gallon (19L) containers of Universal F3 Green™ 3x3 compared to seven or more containers of Universal Gold™ 1x3%, cutting foam concentrate replacement cost in half and quadrupling on-scene time for the single engine with no fluorine downside.

This could eliminate tanker shuttles or long LDH lays to hold security on a large spill or an upset, leaking fuel tanker.

In a slightly larger example, two engines with 500 gallons (1892 L) onboard can run a 500 gpm (1892 L) trailer monitor twice, providing +/- four hour of suppression time, using 30 gallons (114 L) of foam.

[1] **Available From Combat Support Products**

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Factory Agents Since 1988

THE PFAS STORY 12/2018

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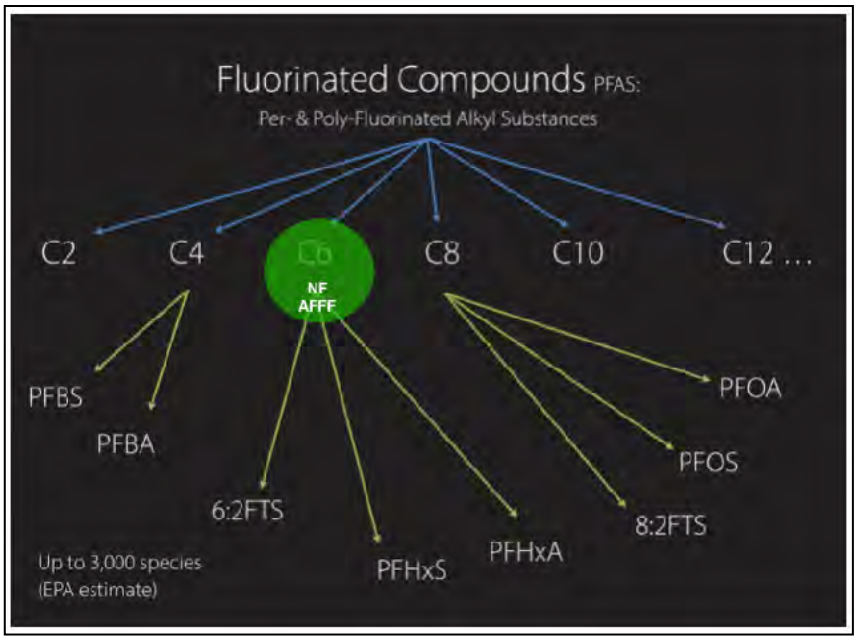
Further to inquiries regarding the fluorinated compounds, per & poly-fluoro-alkyl substances (PFAS) in Universal Gold 1x3% AR-AFFF and Knockdown Class A foam. I can confirm that Universal Gold and virtually all modern AFFF or AR-AFFF firefighting foams regardless of manufacturer contain PFAS. Class A foams use no PFAS components in their formulations.

PFAS compounds are the film forming component in aqueous film forming foams and are responsible for speedy knockdown, minimal water use, safety margin and security for firefighters operating at gasoline and oil spill fires.



Modern C-6 PFAS film forming components in National Foam AFFF products do not contain undesirable PFOS or PFOA substances.

Evolving Technology
Universal Green 3x3 Alcohol Resistant foam contains no PFAS substances and is known to be a “fluorine free” (F3) foam. It isn’t as efficient in terms of speed and fuel tolerance on ***ignited*** spill fires as Universal Gold 1x3% AR-AFFF, it is however, UL listed for use on hydrocarbon and alcohol fuel fires without complex PFAS film forming chemistry.

COMPROMISE

Put the fire down with Universal Gold 1x3 AR-AFFF and secure it with Universal Green 3x3 AR-F3. When faced with long term vapor suppression activities at crash scenes Universal Green 3x3 AR-F3 is a very effective and environmentally responsible alternative to using AFFF for vapor suppression missions, which is often the case for Fire Department users.

For those having large foam firefighting assets it might be wise to cary dual agents, one for firefighting spills and the other for vapor suppression.

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