

Fire Fighting Foams: Fluorosurfactants versus Fluorine Free



THE SITUATION IN THE USA

Due to environmental concerns surrounding fluorosurfactant-containing firefighting foams - including AFFFs and AR-AFFFs - a public hearing was held earlier this year in Washington State, USA. At this hearing, expert witnesses from the fire fighting foam industry spoke of the need to continue the use of fluorosurfactant-containing fire fighting foams in catastrophic fires due to concerns over the effectiveness of fluorine free foams on Fuel-in-Depth fires.

In response to this hearing, legislation was passed which **will not ban** but will **restrict** the sale and use of such foams from July 1st 2020 within Washington State. From this date, fluorosurfactant-containing fire fighting foams can only be sold for use in:

- > **Military & FAA-regulated airports**
- > **Oil Refineries & terminals**
- > **Chemical plants**

Furthermore, as of July 1st 2018 the use of fluorosurfactant-containing fire fighting foams for training purposes is no longer allowed.

TESTIMONIAL BY MITCH HUBERT, VICE PRESIDENT, SOLBERG

"Solberg manufactures both fluorinated and non-fluorinated products and in fact we are probably the leader in selling non-fluorinated products. We have products that have passed Underwriters Laboratories and Factory Mutual fire performance tests and we actively market these products.

However, **I have a very grave concern that this total ban would take away the ability to extinguish large catastrophic fires** such as process area fires in refineries or fuel storage tanks, large atmospheric fuel storage tanks and **the reason is, quite honestly, the fluorine free foams lose a lot of their effectiveness when you get into Fuel-in-Depth type fires.**

Fluorine foams are very effective on spill fires but once you get to a situation where the foam has to plunge below the surface because of the application techniques, the fluorine free foams actually pick up some of that fuel and by the time the foam comes to the surface, it actually burns. Yes, you can do a control burn down in some situations, but you don't want a situation like they had in Buncefield, England where one tank caught on fire and then another one caught on fire and then another one caught on fire and you had a huge ecological disaster from their inability to extinguish the first fire.

So **I would strongly recommend that the people here take a look at the best practices.** We are actively telling people not to train with fluorinated foams, use non-fluorinated foams where ever you can, but **maintain the short chain chemistry AFFFs and AR-AFFFs that need to be used for critical situations like aircraft rescue firefighting and large catastrophic Fuel-in-Depth type fires."**

This is an edited extract of the testimonial provided by Mitch Hubert at the Washington State Public Hearing ESSB 6413 on the 15th of February 2018. Video footage: <https://www.tw.org/watch/?clientID=9375922947&eventID=2018021146&eventID=2018021146&autoStartStream=true>

INTRODUCTION

Recently you may have heard of calls to ban fluorosurfactant-containing firefighting foams - i.e. C6 Aqueous Film-Forming Foams - due to environmental concerns surrounding perfluorooctanoic acid (PFOA).

C6 Foams may contain trace quantities of PFOA as an unintended by-product of the surfactant manufacturing process and as such countries such as Norway, Germany, Australia and the USA have been calling for their total ban. As a result of this, some groups have been encouraging the use of Fluorine Free foams as replacements to AFFFs.

However, before people make the complete switch to Fluorine Free Foams, there are some important things to note...

THE SITUATION IN EUROPE

AFFFs have not been banned in Europe. Instead, a new EU Regulation - EU 2017/1000 - was published on June 13 2017 regarding the allowable content of perfluorooctanoic acid (PFOA), its salts and PFOA-related substances in fire fighting foams.

The regulation requires that **by 4th July 2020**, fire fighting foam concentrates must not contain concentrations greater or equal to:

- > **25 parts per billion** (ppb) of PFOA or its salts
- > **1000ppb** of one or a combination of PFOA-related substances

Our range of Aberdeen Foam AFFF-C6 concentrates already meet this regulation, over two years before the deadline!

Component	Amount allowable under EU regulation EU 2017/1000	Amount contained in a typical produced Aberdeen Foam AFFF-C6
> PFOA or its salts	≤25ppb	0.015ppb
> PFOA-related substances	≤1000ppb	0.54ppb

1 part per billion = 0.0000001%, meaning that produced Aberdeen Foams contain 0.000000015% PFOA or its salts and 0.000000054% PFOA-related substances.



WHICH FIREFIGHTING FOAM IS BEST FOR THE ENVIRONMENT?

According to the UK Environmental Agency: **whichever one is best at putting out fires!***

- > All foams pollute as they contain a wide range of polluting chemicals such as detergents, surfactants and solvents
- > Fire water run-off is polluting
- > **But you should always use the firefighting foam which is best suited to your fire risk!**

*Presentation by Matthew Gable, Senior Emergency Planner, Environment Agency at the Angus Fire Foam Seminar, Manchester, UK, 3rd June 2014.

When is it recommended to use C6 AFFFs instead of Fluorine Free Foams?

Fire Risk	C6-AFFF	Fluorine Free
> Catastrophic hydrocarbon fires	✓	✗
> Alcohol / Polar solvent fires	✓	✗
> Oil refineries & terminals	✓	✗
> Chemical plants	✓	✗
> Military & Airport fires	✓	✗
> Fuel-in-Depth fires	✓	✗
> Small / spill fires	✓	✓
> Domestic fire brigades	✗	✓
> Training exercises	✗	✓