



the long road to C6

C6 FIRE FIGHTING FOAMS

update

Q1:2018

THE LONG ROAD TO C6

Since 2005, the fire fighting foam industry and its customers have had significant concerns regarding the consequences of foam degradation in the environment.

Under the leadership of the EPA in America, fluorosurfactant manufacturers and their customers worked together to develop environmentally safer foam products.

This collaboration resulted in global reformulation of foam concentrates in order to replace longer chain C8-C12 molecules and use only C6 fluorosurfactants.

C6 fluorosurfactants cannot degrade to cause environmental concern. **C6 AFFF technology has now been accepted for use in both the USA and Europe.**

The information below has been written to help our customers understand the regulatory changes which have led to the development of new C6 fire fighting foams.

1956

The American company **3M** start making **Scotchgard**, a water repellent chemical manufactured using fluorosurfactants.

One of the primary fluorosurfactants used in Scotchgard was **Perfluorooctanesulfonic acid** - also known as **PFOS**.

3M also manufacture **Aqueous Film-Forming Fire Fighting Foams** (AFFFs) using the same fluorosurfactants used in Scotchgard.

2002

A study by the Environmental Directorate of the Organisation for Economic Co-operation and Development (OECD) finds that "**PFOS is persistent, bioaccumulative and toxic to mammalian species.**"

2003

3M changes the formulation of Scotchgard to remove PFOS.

2005

3M withdraws from the manufacture and sale of AFFFs.

2009

PFOS is classified by the Stockholm Convention as a **Persistent Organic Pollutant**.
The use of PFOS is banned across Europe.

2010

Global concerns are raised about **Perfluorooctanoic acid (PFOA)**, a chemical closely related to PFOS. PFOA can be created by the breakdown of fluorosurfactants with a carbon chain length of C8 or greater.

In the USA, the Environmental Protection Agency (EPA) establish what is known as the **2010/15 PFOA Stewardship Programme**. The purpose of this programme is to eliminate the manufacture of any fluorosurfactant which has the possibility to breakdown into PFOA or PFOS, ie flurosurfactants with a carbon chain length of C8 or more. The deadline for this is set for the end of **2015**.

In the fire fighting foam industry, this means that all AFFF manufacturers are required to **reformulate their foam concentrates using C6 fluorosurfactants** by the end of 2015. **C6 fluorosurfactants can not degrade to PFOA.**

2014

The US EPA issued a **SNUR (Significant New Use Rule)** banning the manufacture, importation or processing of long chain fluorotelomers and other long chain fluorinated compounds (LCPFC's). These include **fluorosurfactants with a carbon chain length of C8 or greater used in the manufacture of Fire Fighting Foam concentrates.**

2015

A report by the US EPA states they are **"not conducting [an environmental] assessment of AFFs because they are now made with C6-based fluorosurfactants."**

However, while C6 AFFFs are not made using PFOA or any PFOA-related products, **they may still contain trace quantities of PFOA** as an unintended by-product of the surfactant manufacturing process.

As a result of this, territories including Norway, Germany and Queensland, Australia lobby their respective legislators to **seek a ban on any chemical that can breakdown to from or contain any amount of PFOA.**

2016

The European Chemicals Agency (ECHA) issue a ruling which allows C6 AFFF's to be manufactured and sold within Europe: **C6 Fire Fighting Foams are finally approved for use in Europe!**

2017

Within Europe, C6 foam legislation has been concerned strictly with their environmental impact, while in the USA C6 foams have been approved for use by application.

The situation in the USA:

As of February, **C6 AFFFs are approved by the US EPA and the US military**, but can only be sold for **federally mandated uses**, ie in military & FAA-regulated airports.

The situation in the Europe:

In Europe, a new EU Regulation EU 2017/1000 is published regarding PFOA and related substances. The regulation requires that **by 4th July 2020**, fire fighting foam concentrates are not allowed to include a concentration greater than or equal to:

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

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2017 (continued)

Our Aberdeen Foam AFFF-C6 concentrates meet EU 2017/1000 - and contain considerably fewer than the maximum quantities allowable - over two years before it comes into force!

Component	Amount allowable under EU regulation EC 2017/100	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 0.0000000015% PFOA or its salts and 0.000000054% PFOA-related substances.



2018: Important Announcement on Fluorine Free Foams

Global discussions about the possibility of a **total ban on fluorosurfactant-containing AFFs** result in some groups encouraging the use of Fluorine Free Foams as a replacement to AFFs.

A public hearing in Washington State, USA, discussed the possibility of this ban. Expert witnesses from the fire fighting industry were called to testify, one of whom was **Mitch Hubert**, the Vice President of the **Solberg Company**.

Mr Hubert testified that he had **“a very grave concern that this total ban would take away the ability to extinguish large catastrophic fires”** and stated that fluorosurfactant-based AFFs and AR-AFFs **“need to be used for critical situations like aircraft rescue firefighting and large catastrophic Fuel-In-Depth type fires”**.

In response to this hearing, legislation was passed in March which will **not ban but will restrict the sale and use of such foams** from July 1st 2020. From this date, fluorosurfactant containing fire fighting foams can be sold for use on **large scale catastrophic fires** in:

- > Military & FAA-regulated airports
- > Offshore platforms
- > Oil refineries & terminals
- > Chemical plants

Furthermore, as of July 1st 2018 the use of AFFs for training purposes is no longer allowed.

STOP PRESS

As of April 2018, the **US EPA are considering adopting similar regulations to the ones used in Europe** in regards to PFOA and related substances.

If this happens, it would provide a **uniform EU-US set of requirements** for the approved use of fluorosurfactant containing fire fighting foams.

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