FFFC Fire Fighting Foam Coalition

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FACT SHEET ON AFFF FIRE FIGHTING AGENTS

You may have heard recently about a potential environmental issue related to aqueous film forming foam (AFFF) fire fighting agents. You may have also heard that certain types of AFFF are no longer manufactured. The Fire Fighting Foam Coalition has produced this fact sheet to provide you with accurate, balanced information about this issue.

Fluorinated Surfactants

All AFFF fire fighting agents contain fluorinated surfactants (fluorosurfactants). They are key ingredients that provide AFFF with the required low surface tension (15 to 17 dynes/cm) and positive spreading coefficient that enables film formation on top of lighter fuels. It is this film formation capability that gives AFFF its name and its effectiveness against flammable liquid fires.

The chemicals used to produce fluorosurfactants can be manufactured by different processes and have different chemical structures. The fluorosurfactants used in AFFF have historically been produced from fluorochemicals manufactured by two methods: electrochemical fluorination and telomerization. AFFF agents manufactured by 3M contain fluorosurfactants produced by electrochemical fluorination. Virtually all other AFFF agents contain fluorosurfactants produced by telomerization.

PFOS

In 2002, 3M voluntarily stopped production of a number of products including AFFF agents because they contain and degrade into perfluorooctane sulfonate (PFOS). PFOS is considered by environmental authorities to be persistent, bioaccumulative and toxic (PBT). Regulations in the United States, Canada, European Union, Australia, and Japan act as a ban on new production of PFOS-based products including foams. These regulations do not currently restrict the use of existing stocks of PFOS-based foam in the US, Australia, or Japan. In the EU and Canada, existing stocks of PFOS-based foam must be removed from service in 2011 and 2013, respectively. Production and sale of PFOS foams continues in China.

Telomers

All modern AFFF agents (except some produced in China) contain telomer-based fluorosurfactants. Telomer-based AFFF agents do not contain or break down into PFOS and have about 30 - 60% less fluorine than PFOS-based AFFF. Telomer-based AFFF agents are not made with any chemicals that are currently considered by environmental authorities to be PBT.

The US Environmental Protection Agency (EPA) has indicated that some telomer-based fluorochemicals can break down in the environment into perfluorooctanoic acid (PFOA) or other perfluorocarboxylic acids (PFCAs). Further, EPA states that their concern is focused on long-chain perfluorinated chemicals (LCPFCs) containing eight carbons or more (C_8, C_{10}, C_{12}). Existing data shows that shorter-chain compounds (C_6 and below) have a lower potential for toxicity and bioaccumulation.

EPA PFOA Stewardship Program

Under the EPA 2010/15 PFOA Stewardship Program eight fluorochemical manufacturers have voluntarily agreed to reduce by 95% by year-end 2010 and work to eliminate by year-end 2015 both plant emissions and

product content of PFOA, PFOA precursors, and related higher homologue chemicals. EPA intends to propose a regulation in 2012 that would close any loopholes in the Stewardship Program such as treated article imports.

EPA Program - Impact on AFFF

The EPA Stewardship Program is focused on eliminating telomers with eight or more carbons (C_8 or above). Historically, the majority of the fluorosurfactants used in telomer-based AFFF have been derived from six-carbon molecules (C_6). Some current AFFF formulations contain over 90% pure C_6 fluorosurfactants, but others contain a higher percentage of C_8 and above.

Over the next few years, AFFF manufacturers will be introducing reformulated products that contain only C_6 fluorosurfactants. These new fluorosurfactants must be approved by EPA under the TSCA New Chemicals Program. There have been foam agents on the market for 25 years that contain more than 90% C_6 fluorosurfactants and meet the toughest industry specifications. This history makes manufacturers confident that the new products will retain the same fire suppression capabilities as existing agents. Changes to formulations may require products to be re-qualified under the various specifications such as UL and FM.

AFFF Manufacturers

What are AFFF manufacturers doing to address the environmental concerns about AFFF? AFFF manufacturers, in conjunction with fluorosurfactant manufacturers, have formed the Fire Fighting Foam Coalition Inc. (FFFC). The Board members of FFFC are Ansul, Chemguard, DuPont, Dynax, Kidde, and Solberg.

FFFC was formed to represent the fire fighting foam industry's interests on all issues related to the environmental acceptability of AFFF agents. The coalition provides a focal point for technical reviews, development of industry positions, and interactions with relevant organizations such as environment agencies, militaries, and standards organizations.

FFFC will:

Support users of AFFF by serving as a single source for accurate, balanced information on environment related questions.

Establish a dialog with EPA and other regulatory authorities to ensure that they have accurate information about the makeup and use of fire fighting foams.

Establish a dialog with the US Department of Defense on technical and environmental issues related to AFFF agents.

FFFC Membership

Membership is open to any company or organization interested in AFFF-related issues including users, distributors, equipment manufacturers, agent manufacturers, surfactant manufacturers, and telomer producers. Membership and participation by AFFF users is encouraged.

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Conclusions

Telomer-based AFFF agents are the most effective agents currently available to fight flammable liquid fires in military, industrial, and municipal settings. They do not contain or breakdown into PFOS and are not likely to be a significant source of LCPFCs. They do contain fluorosurfactants that are persistent, but are not generally considered to be environmental toxins. AFFF and fluorochemical manufacturers are in position to meet the goals of the EPA PFOA Stewardship Program with a new family of fluorosurfactants that provide the same fire protection characteristics with reduced environmental impacts.