



Chemguard Specialty Chemical and Fire Suppression Products

An Environmental Statement

Fluorine-containing organic surfactants, or fluorosurfactants, are used in everyday consumer and industrial products such as paints, waxes, cleaners, polishes, adhesives, inks and, notably, fire-fighting foams. There are no known substitutes that have the same functionality and outstanding performance characteristics. Often, fluorosurfactant products are misunderstood to be made from perfluorooctanoic acid (PFOA) or perfluorooctane sulfonate (PFOS), when in fact there are a large number of different types of fluorosurfactants in use.

Chemguard Specialty Chemical and Fire Suppression Products contain no significant levels of PFOA or PFOS. Neither PFOA nor PFOS is an intentional ingredient in any Chemguard products.

Over the past decade or so, there has been increasing concern about products that contain PFOA or PFOS. Both are thought to be persistent in the environment, bioaccumulative, and potentially toxic. The US Environmental Protection Agency became aware in the late 1990's that PFOS was found at very low levels in blood samples representing the general population.¹ However, studies show that blood levels have been declining in the past decades.² PFOA and PFOS are produced by the electrochemical fluorination (ECF) process practiced by several companies within the US and abroad, although, this production process is in decline. As a business decision based on precaution, 3M ceased commercial production of PFOS in 2002.³

However, given the scientific uncertainties regarding exposure routes and human health effects, the EPA does not believe there is any reason for consumers to stop using any consumer or industrial related products because of concerns about PFOA.¹ The limited, but still existing, stocks of such products are still allowed for use until supplies are exhausted.⁴ Despite the low risks, the precautionary principle (i.e., caution due to uncertainty) requires that action be taken to further minimize any potential adverse effects these substances may pose. In 2006, the EPA initiated its "2010/15 PFOA Stewardship Program" in which industrial participants agree, in summary, to (1) reduce by 95% the product content and emissions of PFOA and precursor materials by 2010, and (2) eliminate such by 2015.

To distinguish PFOA and PFOS from fluorosurfactants that are in common use, it is necessary to have a sense of the chemical structures involved. Both PFOA and PFOS molecules contain a chain of 8 carbon atoms in which all the typical hydrogen atoms bonded to the carbons are substituted with fluorine atoms.⁵ This chemical group is generally referred to as a "C8 perfluoroalkyl chain," or simply as "C8". The fluorine-carbon bond, also found in Teflon®⁶

products, is very strong, making the molecule resistant to degradation and adhesion. The C8 chain length has been preferred for fluorosurfactants because it gives optimum performance to a large number of product properties. Due to its common use, it has also received the most scrutiny, as mentioned above. The response by manufacturers, driven by EPA and other such regulatory authorities, has been to shift production to C6-based substances, which cannot degrade to C8. The EPA's 2010/15 PFOA Stewardship Program applies to all potential PFOA precursors, which includes C8 and longer chain lengths.

Furthermore, fluorosurfactants today are based on an entirely different production process, known as telomerization, as opposed to the ECF process mentioned above. Telomerization chemistry does not use or produce PFOS, however trace levels of PFOA may result as a byproduct. As a class, however, telomerization products have been shown in EPA studies to be neither toxic nor bioaccumulative.⁷ Fluorosurfactants based on C6 telomerization chemistry cannot degrade into PFOA or PFOS.⁸

All Chemguard fluorosurfactants are derived from the telomerization process and are therefore substantially free of both PFOA and PFOS. Only trace levels of PFOA are present, and these originate as minor impurities in the raw materials that Chemguard relies on, as mentioned. At present, Chemguard Specialty Chemical products typically contain less than 5 ppm PFOA. As a practice, fluorosurfactant use in Fire Suppression foams is minimized by synergistic formulation with non-fluorinated surfactants and other components to provide maximum effectiveness. Therefore, Chemguard Fire Suppression foams typically contain less than 1 ppm PFOA. Chemguard is a participant in the EPA 2010/15 PFOA Stewardship Program and dedicated to ultimately eliminating C8 and longer chain chemistry from all products. As our conversion proceeds toward C6 chemistry, the PFOA level in our products is expected to fall well below 1 ppm, approaching the lower ppb level.

Chemguard is a conscientious and technology-driven company with a dedication to safety and product stewardship. We share the environmental concerns expressed by our customers and support the progressing regulatory environment in which we operate. We have the research, production and sales capabilities to respond with superior products that meet or exceed both our customers' expectations and our environmental responsibilities.

¹ Source: www.epa.gov/oppt/pfoa/pubs/pfoainfo.htm.

² (a) Environmental Health Perspectives, v. 113, n. 5, May 2005,

(b) Source: www.cdc.gov/exposurereport/perfluorinated_compounds2.htm.

³ Source: solutions.3m.com/wps/portal/3M/en_US/PFOS/PFOA/Information/Action.

⁴ EU and Canada regulations specify deadlines for use.

⁵ PFOA contains a 7 carbon perfluoroalkyl group, with the organic acid functionality representing the 8th carbon.

⁶ Registered trademark of DuPont.

⁷ Industrial Fire Journal, Sept. 2007, p. 26.

⁸ International Fire Protection, August 2008, p. 29.