



### NICNAS Alert No.5

February 2007

This Alert updates NICNAS Alert No. 2 and should be read in conjunction with Alerts No.1 & 2.

#### Perfluorooctane sulfonate (PFOS) & Perfluoroalkyl sulfonate (PFAS)

Perfluorooctane sulfonate (PFOS) refers to fully fluorinated (eight-carbon chain length) sulfonate-containing substances. The acid form of PFOS is 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonic acid (CAS No. 1763-23-1). PFOS-related substances may be salts of PFOS eg. potassium, lithium, ammonium or diethanolamine, or polymers that contain the PFOS as a portion of the entire structure.

PFOS is a member of a large family of perfluoroalkyl sulfonate (PFAS) based chemicals. PFAS is a generic term used to describe any fully fluorinated carbon chain length sulfonate, including higher and lower homologues. PFAS-related substances may be salts of PFAS, or polymers that contain the PFAS as a portion of the entire polymer.

PFOS and PFAS chemicals have unique surfactant properties and many speciality applications including heat, chemical and abrasion resistance, and as dispersion, wetting and surface treatments.

#### Australian Data

In July 2006, NICNAS collected information, through a national survey, on production, importation and use of perfluorinated chemicals including PFOS, PFAS and their related substances, and products/mixtures containing these substances for the calendar years 2004 and 2005. Information provided to NICNAS indicates that:

- PFOS and PFAS related chemicals are not manufactured in Australia.
- No importation of PFOS or PFOS related substances occurred in the calendar years 2004 and 2005.
- A PFOS-containing product was imported prior to 2003 and used for formulation of leather treatment products. The product had been used at volumes of 47 and 13 kg in 2004 and 2005, respectively, and was reported as no longer being used in 2006.
- The only identified use of PFOS substances in Australia is in Class B fire-fighting foam products. Currently, about 180,000 litres of Class B fire-fighting foam products containing 0.1-7% PFOS-related substances are held in stock at some end-user sites. NICNAS was advised that these PFOS based fire-fighting products had been purchased prior to 2003 and will be replaced on reaching the product expiry date. Some non-PFOS based fire-fighting foam products containing fluoroalkyl surfactants or alcohol resistant film-forming fluoroprotein have been imported as replacements.
- In 2004 and 2005, the total volumes of PFAS related substances imported both as technical grade chemicals and in products are approximately 1630 kg and 1740 kg, respectively.

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- Three high volume PFAS related substances that were identified from the NICNAS survey are all perfluorobutane sulfonate (PFBS) based compounds. The NICNAS assessment report on PFBS (2006) shows that they are less hazardous than PFOS chemicals. The combined volumes for the three PFBS based substances imported in 2004 and 2005 were 813 kg and 877 kg, respectively. These PFBS compounds are used in Australia for formulating industrial coating products, rubber moulding products and acid mist suppressants. Products containing these PFBS based compounds were also imported in 2004 and 2005 at total PFBS volumes of 810 kg and 860 kg, respectively.
- Uses in low volume of another two products containing PFAS substances were also reported from the survey. A mixture of C9 and C10 PFAS substances was used to formulate floor sealers with combined PFAS volumes of 1.1 kg and 0.9 kg in 2004 and 2005, respectively. An alcohol resistant fire-fighting foam product containing a C6-8 PFAS substance was used in quantities of 4.5 kg in 2004 and 0.6 kg in 2005. The uses of both products have been phased out.
- It is likely that some importers and users may not know if products contain these chemicals because PFOS- and PFAS-based chemical ingredients may not be disclosed or listed on Material Safety Data Sheets.

### International Activities

- The OECD report *Hazard assessment of perfluorooctane sulfonate (PFOS) and its salts* was published in 2002. The report concluded that the persistence of PFOS in the environment, as well as its toxicity and bioaccumulation potential, indicate a cause of concern for the environment and human health.
- The European Union adopted a resolution of restrictions on marketing and use for PFOS and related substances in 2006. The resolution set the maximum concentrations of 0.1% by mass for PFOS-containing semi-finished products or articles, 0.005% by mass for PFOS preparations, and 1 µg/m<sup>2</sup> PFOS for textiles or other coated materials. The Member States are to introduce registration to comply with the Directive by 27 December 2007 and the measures are to be effective from 27 June 2008. All the EU countries are requested to establish inventories for PFOS substances within 2 years and the use derogations will be reviewed when new information on uses and safer alternatives becomes available.
- Following the voluntary phase-out of PFOS by the principal worldwide manufacturer, the USEPA proposed a Significant New Use Rule (SNUR) in 2000 on PFOS chemicals, and 2 SNURs on PFAS chemicals in 2002 and 2006. These SNURs allowed the continuation of a few limited, highly technical uses of these chemicals for which no alternatives were available, and which were characterized by very low volume, low exposure, and low releases. Any other uses of these chemicals would require prior notice to and review by the Agency.
- PFOS is included on the list of Chemicals for Priority Action of the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR).
- PFOS is currently being considered for possible inclusion on the list of the Stockholm Convention on Persistent Organic Pollutants (POPs).

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The OECD assessment report and other documents are available online and can be accessed via links on the NICNAS website at: [www.nicnas.gov.au/news](http://www.nicnas.gov.au/news). Additional information about all the perfluorinated chemicals discussed above will be added to this website as it becomes available.

### NICNAS recommendations

Because of concerns over PFOS and perfluorinated chemicals, NICNAS recommends that:

- PFOS- and related PFAS-based chemicals be restricted to only essential uses, for which no suitable and less hazardous alternatives are available.
- The existing PFOS-based fire fighting foam not be used for fire training purposes to limit environmental release.
- PFOS not be replaced by PFOA as an alternative, as PFOA may have the same environmental and health concerns as PFOS.
- All labels and Material Safety Data Sheets include details of the PFOS and PFAS chemicals in the product.
- Information on the safe use and handling of all these chemicals of concern be provided in the relevant and most recent Material Safety Data Sheets (MSDSs) available from the suppliers of these chemicals.

### How to contact NICNAS

If you want to find out more about these issues or have information on PFOS and PFAS substances in Australia, you can contact NICNAS at:

**Ph:** 1800 638 528

**Fax:** 02 8577 8888

**Write to:** GPO Box 58 Sydney NSW 2001 Australia

Information on assessment of chemicals by NICNAS is available at:  
<http://www.nicnas.gov.au/about/ourapproach.htm>