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RESULTS OF SURVEY ON PRODUCTION AND USE OF PFOS, PFAS AND PFOA, RELATED SUBSTANCES AND PRODUCTS/ MIXTURES CONTAINING THESE SUBSTANCES

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This publication was produced within the framework of the Inter-Organisation Programme for the Sound Management of Chemicals (IOMC).

The Inter-Organisation Programme for the Sound Management of Chemicals (IOMC) was established in 1995 following recommendations made by the 1992 UN Conference on Environment and Development to strengthen co-operation and increase international co-ordination in the field of chemical safety. The participating organisations are FAO, ILO, OECD, UNEP, UNIDO, UNITAR and WHO. The World Bank and UNDP are observers. The purpose of the IOMC is to promote co-ordination of the policies and activities pursued by the Participating Organisations, jointly or separately, to achieve the sound management of chemicals in relation to human health and the environment.

This document presents the results of the survey of production and use information on Perfluorooctane Sulfonate (PFOS), Perfluoroalkyl Sulfonate (PFAS), Perfluorooctanoic Acid (PFOA), related substances and products/mixtures containing these substances.

The document was prepared by Australia on the basis of the responses received by 10th September 2004. The responses received after this date as well as a compilation of detailed responses are included in the annex.

The Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology at its 37th Joint Meeting endorsed the document and recommended that it be declassified under the authority of the Secretary General, with the following caveat:

The survey on production/importation and use of Perfluorooctane sulfonate (PFOS), other Perfluoroalkyl sulfonates (PFAS), Perfluorooctanoic acid (PFOA), related substances and products/mixtures containing these substances is an initial step in the collection of information on these chemicals. The information collated is not exhaustive and all potential exposure sources may not have been captured due to a number of limitations including those coming from the constraint of confidential business information and difficulties in capturing "related chemicals" such as polymers and products/mixtures. Furthermore, there was no attempt to reconcile all the data. However, the information will be useful for countries wishing to assess and manage the risks arising from these chemicals. An OECD hazard assessment is available for PFOS and its salts, not yet for PFOA.

INTRODUCTION

This paper is a summary of responses to a questionnaire sent to OECD member countries requesting information on the production and use of perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluoroalkyl sulphonates (PFAS chemicals) and products/mixtures containing these chemicals.

PFOS is a fully fluorinated, eight carbon chain length organic compound. PFOS-related/PFOS based substances may be simple salts of PFOS, e.g., potassium, lithium, ammonium, diethanolamine, potassium, or polymers that contain PFOS as only a portion of the entire polymer.

PFOA is a fully fluorinated eight-carbon chain carboxylic acid (CAS Registry Number 335-67-1). PFOA-related substances may be simple salts of PFOA, e.g., sodium, potassium, silver, or ammonium, or polymers that contain PFOA as only a portion of the entire polymer. PFOA-related substances may also be construed to include certain fluorinated telomers, which may produce PFOA as a metabolite or degradation product.

PFAS is a generic term used to describe any fully fluorinated carbon chain length sulfonate, and includes higher and lower homologues as well as PFOS. PFAS-related substances may be simple salts or polymers that contain the PFAS as only a portion of the entire polymer.

BACKGROUND

The 34th Joint Meeting (5-8 November, 2002) endorsed a draft assessment of PFOS and its salts by the United States (US) and the United Kingdom (UK). The Hazard Assessment concludes that PFOS and its salts are persistent, bioaccumulative and toxic to mammalian species.

At the 35th Joint Meeting (11-13 June, 2003), Australia confirmed that it would take the lead for PFOS-related activity and draft a questionnaire for circulation to OECD member and non-member countries.

A preliminary draft Hazard Assessment of PFOA released by the US EPA in August 2002, found that PFOA and its salts are of similar concern due to structural analogy with PFOS. Consequently, as a result of the health and environmental concerns for this class of chemicals, the most recent 36th Joint Meeting (4-6 February, 2004) endorsed the collection of data on PFOA as well as other fully fluorinated carbon chain length sulphonate chemicals (known generically as perfluoroalkyl sulphonates or PFAS), in addition to PFOS.

At the 36th Joint Meeting, Canada, Japan, US and Switzerland agreed to comment on the draft questionnaire. The draft circulated questionnaire was revised according to constructive comments received by the OECD Secretariat from these member countries.

The questionnaire was also forwarded to OECD non-member countries through the Rotterdam Convention Secretariat. At the time of preparation of this paper, no responses were received from non-member countries.

Survey Responses

Responses were received from 10 OECD countries – Australia, Belgium, Finland, Hungary, Italy, Japan, Poland, United Kingdom, Sweden and the United States of America. The European Chemicals Bureau (ECB) of the European Commission also provided information on these chemicals from their IUCLID database.

Data provided in most surveys were limited. In responses from several countries, volume and use data were deemed unsuitable for disclosure due to confidentiality of business information or regulatory restrictions. For several responses, importation could not be distinguished from manufacture. In these cases, data could only be compiled on the total trade of chemicals or products. In other cases, individual PFOS, PFOA or PFAS chemicals or even raw chemicals and products containing these chemicals were not distinguished. One survey response included separate information from one company.

Data were provided for year 2003 unless indicated otherwise.

PFOS

Importation of Individual Chemicals

The survey indicates the importation of PFOS and related chemicals by few countries and involving only small amounts of chemicals.

A single country indicated importation of approximately 0.5 tonnes/year of PFOS or related raw chemicals. Another single country indicated the possibility of importation of small amounts of PFOS or related raw chemicals but no data were provided.

Manufacture of Individual Chemicals

Similar to importation, the survey indicates the manufacture of PFOS and related chemicals by few countries. The total volume is imprecise.

Two individual responding countries indicated manufacture of a total of 3 PFOS-related raw chemicals. In the first, the total volume of manufacture of 2 chemicals was less than 20 tonnes. The second indicated manufacture of a single PFOS-related raw chemical at not more than 100 tonnes/year, but the exact volume could not be disclosed.

One country indicated that all production of PFOS ceased in 2002.

For Europe, the ECB noted 10 PFOS-related raw chemicals in trade (imported and/or manufactured) since 1996 or 2000 each in volumes less than 1000 tonne/year.

Importation/Manufacture of Products/Mixtures

Products containing PFOS and related chemicals are still imported and/or manufactured in the OECD. The total volume of PFOS and related chemicals reported in these products is imprecise but is likely to be at least 30 tonnes/year.

In many cases, importation was not distinguished from manufacture and so the information provided could only reflect a total trade in these chemicals. Also, volume data were often missing or imprecise and, in all cases, product names were deemed confidential business information and not disclosed.

It is important to note that PFOS and related chemicals may not always be listed on MSDS for products/mixtures. Therefore, importers may not be aware of the presence of PFOS and related chemicals within products/mixtures and so these products/mixtures may not always be reported.

A total of 4 countries indicated importation and/or manufacture of products/mixtures containing at least 4 different PFOS-related chemicals. One of these countries indicated a total trade of approximately 10 tonnes/year of products containing at least 3 PFOS and related chemicals. Unfortunately, in this case, the proportion of chemicals in the products was not provided and so the volume of chemicals could not be calculated.

Another country recorded approximately 175 kg of chemical importation. Another recorded a total of approximately 3 tonnes of product-related combined PFOS/PFAS importation. One country indicated a combined volume of trade (importation and/or manufacture) of approximately 20 tonnes/year of PFOS or related chemicals in products.

One country included separate data from a single company that indicated trade (importation and/or manufacture) of products containing a total of approximately 10 tonnes/year of chemicals for the year 2002. However, the company indicated that these chemicals were phased out in December, 2002.

General Uses of Individual Chemicals or Products/Mixtures

Survey responses indicated the use of PFOS or related raw chemicals in industrial processes only. No domestic uses for the raw chemicals were noted.

The processes identified were metal plating and electronic etching operations, semiconductors, metal coatings, in wax or other polishing agents, cleaning agents, in sealants or as a chemical intermediate. Chemicals were present in products in proportions ranging from 0.001% - 50%. For uses in electronic etching or metal plating, PFOS or related chemicals were noted as present at 5% - 25%.

For Europe, the IUCLID database contained the following industry sectors associated with PFOS and related chemicals: chemical and polymers industries, metal extraction, refining and processing, paint, lacquers and varnishes industry, paper pulp and board industry, textile industry and other non-specified industries.

Uses for PFOS and related chemicals reported for Europe were as fixing agents, flame retardants and fire preventing agents, foaming agents, impregnation agents, solvents, intermediates and other non-specified uses.

A recent risk reduction strategy report for PFOS published recently in the United Kingdom and posted on the OECD website confirms current uses in the EU in metal plating, fire fighting foams, the photographic industry, in semiconductor photolithography and aviation hydraulic fluids. The report also provides the following specific volume data for the EU:

Table 1. Estimated Current Use of PFOS Related Chemicals in the EU

Metal Plating	10 tonnes/year
Photographic Industry	1 tonne/year
Semiconductor Industry	0.5 tonnes/year
Aviation Industry (hydraulic fluids)	0.73 tonnes/year
Fire Fighting Foams	122 tonnes/year

Essential Uses

The essential uses reported by individual countries for PFOS and related chemicals are as ingredients in fire fighting foams (Class B fires), aircraft hydraulic fluids, chromium plating (mist suppressants), anti-reflective or photoresist agents in semiconductor photolithography and anti-static, surfactant or adhesion control agents in photographic processes.

The UK PFOS risk reduction strategy report notes several essential uses in the photographic and photolithographic (semiconductor) industries.

New Uses

No new uses were reported.

Replacement Chemicals and Processes

Three countries indicated the use of replacements for PFOS and related chemicals.

The first indicated that although specific identities for replacements or substitutes are regarded as confidential business information, other perfluoroalkyl sulfonates and various fluorinated telomers are noted as substitutes for PFOS and related chemicals.

One country indicated the use of non-PFOS fluorosurfactants, silicon and hydrocarbon based surfactants and other fluorine free components as substitutes in fire-fighting foams.

Company data included in the submission from another country noted the existence of several commercialised substitutes for fluoropolymers, for agents for the protective treatment of carpet, textiles and leather and chemical surfactants. One technology utilises perfluorobutane sulfonate as a C4 building block compound providing PFOS substitutes with reported lower toxicity and bioaccumulation potential.

The following additional detailed information was available from the UK PFOS risk reduction strategy report.

The UK PFOS risk reduction strategy notes that PFOS based substances are no longer used in the manufacture of fire fighting foams. Telomer and fluorine free alternatives are available. The current use of PFOS is associated with unused foam stocks. A submission from an individual company confirms that the use of PFOS and related chemicals in fire fighting foams and in industrial moulded goods was phased out in December 2002.

In metal plating, alternative processes (eg. use of Cr (III) in place of Cr (VI)) are available that restrict the requirement for PFOS. However, previous industry and regulator led initiatives to promote a shift to Cr (III) technology in this industry have apparently had limited effectiveness.

In the photographic industry, telomers have replaced PFOS based chemicals in some applications. However, a subset of critical applications exists for which no alternatives have yet been found.

In semiconductor photolithography, PFOS substitutes are available for some applications (details not known) but important applications still exist for which no alternatives are yet established.

There are currently no alternatives to the use of PFOS in aviation hydraulic fluids. Moreover, the development of new aviation technologies is associated with long review, testing and approval timeframes.

PFAS

Importation of Individual Chemicals

The survey noted the importation of PFAS and related chemicals by only one country: a single PFAS and related chemical was imported in volumes less than 1 kg/year.

Manufacture of Individual Chemicals

Another single country indicated manufacture of 4 PFAS and related raw chemicals with a total volume of manufacture of approximately 7 tonnes/year.

For Europe, the ECB noted 6 PFAS and related raw chemicals imported and/or manufactured each in volumes less than 1 000 tonne/year.

Importation/Manufacture of Products/Mixtures

The survey notes responses from 3 countries indicating importation and/or manufacture of products containing PFAS and related chemicals. The total volume of chemicals in trade (combined importation/manufacture) totalled at least 500 tonnes/year.

One country indicated importation only of 3 products with a total product volume of less than 6 tonnes. The number of chemicals and their proportion in the products was not provided and therefore the total volume of chemicals could not be calculated.

The second country indicated trade (combined importation/manufacture) of 3 PFAS and related chemicals in a total product volume of 38 tonnes/year, representing a total volume of PFAS and related chemicals of less than 9.5 kg/year.

Company data included in the submission from the third country indicated a total trade (combined importation/manufacture) in PFAS and related chemicals of less than 500 tonnes/year.

General Uses of Individual Chemicals or Products/Mixtures

Individual country responses indicate uses of raw PFAS and related chemicals in industrial uses only as reagents in small amounts and in fire resistant aviation hydraulic fluids. No domestic uses were noted.

With regards to products/mixtures, the responses from 3 countries indicated both industrial and consumer uses for PFAS or related chemicals in leather, carpet and textile treatments, surfactants, battery components, surface coatings, waxes and other polishing preparations, washing agents and as mist suppressants.

PFOA

Importation/Manufacture of Individual Chemicals

The survey noted importation and/or manufacture of PFOA and related raw chemicals by a total of 4 countries. The total known trade in PFOA and related chemicals is likely to be between 100 and 200 tonnes/year, but possibly up to 800 tonnes/year.

The first country indicated manufacture of 2 chemicals in a combined volume of less than 37 tonnes/year. The second indicated trade in 2 chemicals in a combined volume of less than 1 kg. The third noted trade in 4 PFOA and related raw chemicals in a combined volume of not more than 100 tonnes/year. The exact volume could not be disclosed. The remaining country similarly noted the total import/manufacturing volume of a single PFOA and related raw chemical as confidential business information but indicated a total national manufacturing capability of less than 660 tonnes/year.

For Europe, the ECB noted 2 PFOA and related raw chemicals imported and/or manufactured each in volumes less than 1 000 tonne/year.

Importation/Manufacture of Products/Mixtures

The survey indicated importation and/or manufacture of products/mixtures containing PFOA and related chemicals by 5 countries.

One country declared products containing 6 PFOA-related polymers/telomers with a total product import volume of 27.5 tonnes/year. The proportion of chemicals in these products was noted as variable and so the total volume of chemicals in these products could not be calculated. The other country noted importation of products containing a single PFOA-related chemical. The import volume was not provided.

The manufacture of products containing PFOA and related chemicals was noted by only one country. The total manufacture volume for a single chemical was 2.2 tonnes/year.

Company data included in the submission from one country indicated a total trade (combined importation/manufacture) in PFOA and related chemicals in that country of up to 15 tonnes/year. Another country also indicated combined importation/manufacture of PFOA and related chemicals in products but could not provide volume information.

General Uses of Individual Chemicals or Products/Mixtures

Responses indicated only industrial use and no domestic use of raw PFOA and related chemicals. Noted uses for these chemicals were as polymer processing aids in photographic film, as reagents, as surfactants and for semiconductors.

Products containing PFOA and related chemicals were used only for industrial purposes. No domestic uses were noted. The specific industrial uses were as metal coatings (eg. non-stick cookware), surface coatings, textile treatments, additives for plastic resins and aqueous dispersions and for glass fibre impregnation.

References

Risk and Policy Analysts Limited (2004) Perfluorooctane Sulphonate. Risk Reduction Strategy and Analysis of Advantages and Drawbacks. Report prepared for Department for Environment, Food and Rural Affairs and the Environment Agency for England and Wales, August 2004.

ANNEX

This annex presents the detailed responses to the questionnaire on production and use of Perfluorooctane sulfonate (PFOS), Perfluoroalkyl sulfonate (PFAS), Perfluorooctanoic acid (PFOA), related substances and products/mixtures containing these substances. It also includes responses received after 10th September and before 10th November 2004.

The questionnaire was sent by OECD on 1st June 2004 and answers were requested by 30 July; the date for response was extended to 31st August 2004. The questionnaire was also sent mid August 2004 by UNEP to all the Designated National Authorities (DNA) for the implementation of the Rotterdam Convention and to the Focal Points for the Stockholm Convention, with a request for response by 30 October 2004. The OECD Secretariat clarified that this deadline was only for non OECD countries because the questionnaire was sent later by UNEP.

The Secretariat received responses from the following countries/organization:

Australia	Estonia	**Japan**	Solomon Islands
Belgium	**France**	Kiribati	**Sweden**
Bulgaria	**Finland**	Latvia	**Switzerland**
Canada	Georgia	Lithuania	**UK**
Chili	**Germany**	**New Zealand**	**US**
Congo	Hungary	**Norway**	**European Commission**
Cook Islands	**Ireland**	**Poland**	
Cyprus	**Italy**	Slovak Republic	
Dominican Republic	Jamaica	**Slovenia**	

Only countries with name typed in bold have provided positive responses and/or comments on at least one question. They are mentioned in the following tables when information is available with respect to a particular question.

The other countries either provided a negative response to all the questions related to chemicals production and import (Cook Islands, Estonia, Hungary, Georgia, Jamaica, Kiribati, Latvia, Lithuania, Slovak Republic, Solomon Islands) or explained that the chemicals have not been identified or registered (Chili, Congo, Dominican Republic). Several responses were only provided by the DNA for Pesticides, which is not the most relevant for these chemicals.

The European Commission provided the OECD with the names of the substances included in the IUCLID database, which in principle covers substances produced or imported with a tonnage over 10 t/year; very general information on use categories and volumes was also given. Producers/Importers agreement is necessary for the Commission to provide more detailed information. A letter cosigned by the European Commission and the OECD was sent end of October to ask these producers/importers to release

this information. 3M responded on behalf of two companies that the IUCLID information is no longer up-to-date, and it does not take into account the global phase-out of 'perfluorooctanyl' chemistry as announced in May 2000 and accomplished by the end of 2002 except for a small amount of PFOA for internal use; they plan to correct the IUCLID information. The European Commission also pointed out a few substances on the inventory of New Substances (ELINCS) potentially degrading to PFOS in the environment. Further work would be needed to clearly identify which of these substances are of concern, so they are not listed in this document.

To respond to the survey, countries either addressed directly the questions to industry associations, or searched in inventories, product registers, registers of dangerous (classified) chemicals, literature, or they combined several approaches to find the information. In some countries, it is very difficult to get information if the chemical is not strictly regulated, if the production/import volume is under a particular threshold, or if the number of companies involved in production/import is limited, or without an appropriate customs nomenclature. The Secretariat received several requests for a list of CAS numbers for the substances covered by the questionnaire.

Questions were addressed to the Secretariat with respect to confidentiality. Except for 3M in connection with its phase out of PFOS and PFOS-related substances, the Secretariat did not disclose the name of companies when they were provided by a country. The responses are mostly useful with respect to the uses of the chemicals, products and mixtures. With respect to production and import, the information is very often more qualitative than quantitative and it is not possible to draw conclusions with certainty.

Results of Survey on Production and Use of PFOS, PFAS, and PFOA-Related Substances and Products/ Mixtures Containing these Substances

Question 1: Importation/Manufacture of PFOS and PFOS-Related Substances (Table 1):[1]

	Manufacture (yes/no)/ Import (yes/no)	PFOS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
Australia	No/No	-	-	-	-
Belgium	Yes[2]	-	5 000 (for year 2000) 471 for the EU[4] n/a No use Obviously not in use[5] Under exam.	Photographic[6] Semiconductors[6] Aviation[7] Paper/cardboard transforming Paper/cardboard producers Metal sector.	Industrial Industrial Industrial - Industrial -
	No/No[3]	-	-		-

[1] PFOS-related chemicals may be simple salts of PFOS, *e.g.*, potassium, lithium, ammonium, diethanolamine, or polymers that contain PFOS as only a portion of the entire polymer.

[2] All PFOS, PFAS and PFOA related substances are pooled.

[3] Information provided by 3M. See also Question 2 and note to Table 2 for Belgium (3M).

[4] No specific figures related to Belgium are available.

[5] Based on the outcome of a query conducted towards 13 companies, from which all 5 responders mentioned that the substances/preparations are not used.

[6] More details on type of substances, composition of preparations and use areas are considered as confidential business information (CBI).

[7] See however data submission by the US where headquarter production site is located and from where distribution occurs to EU and non-EU countries, for more details on type of substances, composition of preparations and use areas. At least one distributor in Belgium.

Question 1 (continued)

	Manufacture/ Import	PFOS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
Bulgaria	n/a/Yes	Sulphohalogenated derivatives of hydrocarbons CAS No. 1763-23-1 (Customs code: 2904 9020 0)	Production: None. Import: (#)[9] (492 for year 2002)	n/a	n/a
		Other sulphonated, nitrated or nitrosated derivatives of hydrocarbons (Customs code: 2904 9085 0)[8]	Production: None. Import: 17 464 (40 575 for year 2002)	n/a	n/a
		Diethanolamine and its salts CAS No. 70225-14-8 (Customs code: 2922 1200 0)	Production: (#)[9] Import: : 49 786 (22 599 for year 2002)	n/a	n/a
Canada[10]	No/yes	-	-[10]	-[10]	-[10]
Cyprus	No/No	-	-	-	-
Finland	No/No[11]	-	-	-	-

[8] CAS No. might be 29081-56-9.

[9] The available data are confidential according to Art. 26 and Art. 27 of Law on Statistics (SG 57/1999, as amended in SG 42/2001, 45/2002, 74/2002) – National Statistical Institute.

[10] Data regarding specific imports for each CAS No. are not publicly available. In total, approximately 600 000 kg of perfluorinated alkyl substances were imported into Canada during 1997-2000, and of this total, <250 000 kg were imports of PFOS and PFOS precursors. PFOS alone accounted for <2% of imported perfluorinated alkyl substances and uses included fire-fighting foams, chemical formulation and other/unknown. The most significant Canadian imports of PFOS itself were in the form of the potassium salt, used for fire-fighting foams. PFOS precursors were used for water, oil, soil and grease repellents for packaging, rugs and carpets, and leather; surfactant-detergent, emulsifier, wetting agent, dispersant; fire-fighting foam, other applications. New data will be collected for PFOS, PFOA, PFAS, telomers, others FOR 2004 and are expected to be available in mid-to late-2005.

[11] According to the information Finland has at their disposal, there does not exist either manufacture in Finland or import to Finland as regards PFOS or POFS-related substances.

Question 1 (continued)

	Manufacture/ Import	PFOS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
Germany[12]	Yes/Yes	Perfluoroctanesulfonylfluoride CAS No. 307-35-7 Tetraethylammoniumperfluoro octanesulfonate CAS No. 56773-42-3	Import: 10 000 - 30 000 Production[13]: 10 000 ~ 30 000	Intermediate for the production of PFOS-related substances. Mist suppressant in electroplating industry, surfactant in photographic processing solutions.	Industrial Industrial
Ireland	n/a	n/a	n/a	Semiconductor	Industrial
Italy[14]	Yes/-	1-Octanesulfphonyl fluoride, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,6,-heptatanedecafluoro CAS No. 307-35-7 1-Octanesulfphonyl acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,6,-heptatanedecafluoro-potassium salt	< 20.000 < 2.000	Chemical intermediate Acid mist supressant	Industrial Industrial
Japan	Yes/No	Heptadecafluorooctane-1-sulphonic acid CAS No. 1763-23-1	< 100 000[15]	Semiconductors, etc.	Industrial

[12] Information from five companies are available for PFOS/PFAS/PFOA or related substances/mixtures.

[13] The product is placed as a 50% aqueous solution (see table 2 of Question 2 for Germany).

[14] Information provided by FEDERCHEMICA.

[15] The regulation stipulated that it does not release the specific numerical volume of import/manufacture of PFOS and its related substances if the total volumes of them do not exceed 100 000kg per year.

Question 1 (continued)

	Manufacture/ Import	PFOS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
New Zealand	No/n/a[16]	-/n/a	-/n/a	-/n/a	-/n/a
Norway	No/No[17]	-	-	-	-
Poland	No/No	-	-	-	-
Sweden	No/No	-	-	-	-

[16] Some perfluoroalkyl (PFOS, PFAS, PFOA, related substances and products/mixtures) are listed as Notified Toxic Substances (NOTS), meaning that they may be imported and used. This is not to say that import and use actually occurs simply that the substances are still "registered". Responses to the questionnaire from two companies show that one company has not manufactured perfluoroalkyls since 2002 according to their phase-out plan announced in July 2000 and has not imported products containing perfluoroalkyls since the phase-out date, and the other company only imported a quantity of primer paints that contained a total of 4.25grams of PFOA. More available will be available when these chemicals will be transfered to the Hazardous Substances and New Organisms Act framework, which is not scheduled until mid-2006.

[17] Some use has been registered, but Norway does not know whether it is pure PFOS or in mixtures. Most of the use areas are confidential or probably not discovered yet. See also Question 2, Note to Table 2 for Norway.

Question 1 (continued)

	Manufacture/ Import	PFOS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
Switzerland[18]	No/Yes	CAS No. 2795-39-3	n/a	Metal surface treatment, metal plating, corrosion inhibitor, wood treatment.	Indust. (1),[19] consum.(4).
		CAS No. 29457-72-5	n/a	Photography agent, laboratory chemicals.	Indust. (2), consum. (1).
		CAS No. 56773-42-3	n/a	Photography/auxiliary/ metal plating agent, adhesives cement, paint, metal surface treatment, car surface agent.	Indust. (33), consum. (2).
UK	No/Yes	Tetraethylammonium salt of PFOS	< 500	Metal (chromium) plating.	Industrial
		n/a	n/a (470 for the EU)	Photolithography.	Industrial
		PFOS salt and polymers	n/a (750 for the EU)	Photographic anti-static agents.	Industrial
		PFOS-related	n/a (730 for the EU)	Aviation hydraulic fluids.	Industrial
		PFOS salt	114[20]	Fire-fighting foams.	Industrial

[18] Based on survey of Swiss Product Register, which includes both PFOS and PFOS-related substances, and products/mixtures containing PFOS or PFOS-related substances. The data bank can not prove that registered substances or products are still in use. For historical reasons, also generic terms instead of univocal substance names with CAS numbers were partially used. Due to this feature of the data bank it also can not be guaranteed that all substances in use are detected in the search. See estimates for actual use and application fields in annexed Table A1.

[19] Number in brackets indicated number of actual registered products.

[20] Substantially greater quantities are stored for emergency use.

Question 1 (continued)

	Manufacture/ Import	PFOS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
US[21, 22]	No/Yes	n/a	1 213 955 (for year 2000)	Paper & packaging.	-
		n/a	1 071 227 (for year 2000)	Textile, leather & carpet treatment.	-
		n/a	572 273 (for year 2000)	Industrial surfactants, additives, coatings.	-
		n/a	92 500 (for year 2000)	Fire fighting foams.	-
EU[23]	Yes	N-ethylheptadecafluoro-N-(2-hydroxyethyl)octanesulphonamide CAS No. 1691-99-2	< 1 000 000 (since 1996)	-	-
		2-[[(heptadecafluorooctyl) sulphonyl]methylamino]ethyl acrylate CAS No. 25268-77-3	< 1 000 000 (since 1996)	-	-

[21] The U.S. has no information concerning specific importation of PFOS or PFOS-related substances. However, the U.S. anticipates that importation of limited volumes of such substances is occurring to support the specific uses excluded from the PFAS SNUR, in the industrial use areas of aviation hydraulic fluids, semiconductor and electronics manufacture, and imaging. Based on the information provided by these industries during the PFAS SNUR regulatory process, the U.S. believes that all collective manufacture and import of these chemicals for all of these uses combined would not exceed 8 000 kg/year.

[22] The only public production numbers for all PFOS and PFOS-related substances available in the U.S. were provided by the 3M Company in 2000 in connection with its phase-out of these chemistries (AR226-0600). All PFOS production in the U.S. ceased in 2002. According to 3M, U.S. production of these chemicals in 2000 was projected at 6 490 000 lbs (2 950 000 kg), and U.S. importation of these chemicals in 1999 totaled 239 900 lbs (109 045 kg). The 2000 U.S. production amount was distributed by use as shown in the table.

[23] The response for EU comes from European Chemicals Bureau. Information is given according to IUCLID data base at ECB, and is the highest volume of latest year. See uses found for PFOS and PFOS-related substances in annexed Table A2.

Question 1 (continued)

	Manufacture/ Import	PFOS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
	Yes	Potassium heptadecafluorooctane-1-sulphonate CAS No. 2795-39-3	< 1 000 000 (since 1996)	-	-
		Potassium N-ethyl-N-[(heptadeca fluorooctyl)sulphonyl]glycinate CAS No. 2991-51-7	< 1 000 000 (since 1996)	-	-
		Heptadecafluorooctanesulphonyl fluoride CAS No. 307-35-7	< 1 000 000 (since 1996)	-	-
		Diaquatetrachloro[mu-[N-ethyl-N-[(heptadecafluorooctyl)sulphonyl] glycinato-O1:O1']]-mu-hydroxybis (2-methylpropanol)dichromium CAS No. 68891-96-3	< 1 000 000 (since 1996)	-	-
		Tetraethylammonium heptadeca fluorooctanesulphonate[24] CAS No. 56773-42-3	< 1 000 000 (since 2000)	-	-
		[3-[[(heptadecafluorooctyl)sulpho nyl] (3-sulphopropyl)amino]propyl] (2-hydroxyethyl)dimethyl ammonium hydroxide[24] CAS No. 68298-11-3	< 1 000 000 (since 1996)	-	-

[24] Not in the US EPA list.

Question 1(continued).

	Manufacture/ Import	PFOS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calenda`r year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
	Yes	N-[3-(dimethylamino)propyl]hepta Decafluorooctanesulphonamide[24] CAS No. 13417-01-1	< 1 000 000 (since 1996)	-	-
		Ammonium bis[2-[N-ethyl(heptadeca fluorooctane)sulphonylamino]ethyl] phosphate[24] CAS No. 30381-98-7	< 1 000 000 (since 1996)	-	-

Question 2: Importation/Manufacture of Products/Mixtures Containing PFOS or PFOS-Related Substances (Table 2).

	Manufacture (yes/no)/ Import (yes/no)	**Product/ mixture name**	**PFOS Chemical Name/ CAS No.**	**Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year**	**Conc. Of Substance in Product/ mixture**	**Known Uses of the Product/mixture**	**Specify if Industrial and/or Consumer use, if possible**
Australia[25]	No/Yes as impurities	Confidential	PFOS. Related substances including PFAS (C4-C8)	Confidential. ~ 3 000 as PFAS (including PFOS)	<0.015% Low	Additive product[26] Sealant.	Industrial Industrial
Belgium	Yes[27] Yes/Yes[28]	Fire fighting foam concentrate. Miscellaneous fluoropolymers	CAS No. 38850-58-7 & CAS No. 2795-39-3 Confidential	< 50 000 < 125 000	18% < 0.5%	Fire fighting form. Molded goods.	Industrial & consumer. Industrial

[25] Australia notes as PFOS and PFOS-based chemical ingredients may not be mentioned on Material Safety Data Sheets, importers may not know if products/mixtures contain PFOS and may not have identified all the products containing PFOS.

[26] A specialized industrial additive product used for coating metal components. The reported applications do not include coating for cookware or fabric.

[27] See Question 1 and the notes to Table 1 for Belgium.

[28] Information provided by 3M. 3M has not manufactured the PFOS-related substances in these products after 31 December 2002. These substances were covered by 3M's phase-out announcement of 16 May 2000 and were reflected in 3M's Phase-out Plan submitted to US EPA on 7 July 2000.

Question 2(continued)

	Manufacture /Import	Product/ mixture name	PFOS Chemical Name/ CAS No.	Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year	Conc. Of Substance in Product/ mixture	Known Uses of the Product/mixture	Specify if Industrial and/or Consumer use, if possible
Bulgaria	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Canada	No/Yes[29]	-	-	-	-	-	-
Cyprus	No/Yes	ZONYL ® 9155 carpet protector.	Fluoropolymer	430 lt.	5%[31]	Protection of carpets.	Industrial
		ZONYL ® 8740 protector.	Fluoropolymer	430 lt.	5%[31]	Stain and soil repellent.	Industrial
		Preparations of fire fighting foams.	Fluorocarbons	49 300[30]		Fire fighting foams.	Consumer

[29] It is expected that imports occur. Specific details are not publicly available.

[30] Final product containing fluorocarbons.

[31] In the final mixture for the intended use.

Question 2(continued)

	Manufacture /Import	Product/ mixture name	PFOS Chemical Name/ CAS No.	Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year	Conc. Of Substance in Product/ mixture	Known Uses of the Product/mixture	Specify if Industrial and/or Consumer use, if possible
Finland[32]	No/Yes	Product 1 [33]	CAS No. 70225-14-8[34]	100	25%	Electronic etching baths.	Industrial
		Product 2[33]	CAS No. 56773-42-3[35]	1 000	5 ~ 15%	Metal plating	Industrial
Germany[36]	Yes/No						
	Company 1	Mist suppressant	Tetraethylammonium perfluorooctanesulfonate CAS No. 56773-42-3	20 000 ~ 60 000	50% by weight	Mist suppressant in electroplating industry.	Industrial
	Company 2	Fire fighting foam concentrate[37]	CAS No. 38850-58-7 CAS No. 2795-39-3	< 2 000	12%	Fire fighting foam.	Industrial

[32] According to the Finnish product register there are twelve products containing PFOS/PFOS related substances currently on the Finnish market. Three of the products contain more than 1% (max. 25%) substances in question, nine products contain less than 1% and eight of those nine products contain less than 0.01% PFOS substances. No one of the products are manufactured Finland. In practice only two of the products were imported to Finland during the calendar year 2003.

In addition to above mentioned products it has come up that hydraulic fluids containing PFOS substances for aircrafts are most likely in use also in Finland. They are imported to Finland and at the moment precise import volumes are unknown. It has also appeared that fire fighting foams containing PFOS substances have also been in use in Finland and, as a matter of fact, they still are to some extent. Finland has not been able to get a clear picture of the current situation but according to their knowledge fire fighting foams are stored in hundreds of locations in Finland and quite often part of the stockpile might contain PFOS substances. However, the amount of the foam stored is typically quite small.

[33] According to the Finnish legislation, Finland is not allowed to give information requested for named products.

[34] 1-Octanesulphonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, compd. with 2,2'-iminobis[ethanol] (1:1).

[35] Ethanaminium, N,N',N''-triethyl-, salt with 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulphonic acid (1:1).

[36] See Question 1 and the notes to Table 1 for Germany.

[37] 3M has not manufactured the PFOS related substances in these product after December 31, 2002. These substances were covered by 3M's phase out announcement of May 16, 2000 and were reflected in 3M's Phase out Plan submitted to the United States Environmental Protection Agency on July 7, 2000. No Fire Fighting Foam Concentrate has been imported in 2004 YTD.

Question 2(continued)

	Manufacture /Import	Product/ mixture name	PFOS Chemical Name/ CAS No.	Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year	Conc. of Substance in Product/ mixture	Known Uses of the Product/mixture	Specify if Industrial and/or Consumer use, if possible
	Company 5	AZ Aquatar -III 45	Heptadecafluorooctane-1-sulphonic acid CAS No. 1763-23-1	ca 100	2.6%	Antireflective coating in photolithography.	Industrial
Italy	No/No	-	-	-	-	-	-
Japan	Yes[38]	-	-	-	-	-	-
New Zealand[39]	No/n/a						

[38] Although potassium, lithium, ammonium, diethanolamine, or polymers may be subject to this questionnaire, Japan does not take into account in its answer since it is difficult to figure out a precise picture of PFOS-related substances, and Japan does not have enough result of hazard assessments of each PFOS-related substance. Therefore, Japan is not able to provide the detail of Table 2.

[39] See Question 1 and the notes to Table 1 for New Zealand.

Question 2(continued)

	Manufacture /Import	Product/ mixture name	PFOS Chemical Name/ CAS No.	Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year	Conc. of Substance in Product/ mixture	Known Uses of the Product/mixture	Specify if Industrial and/or Consumer use, if possible
Norway[40]	No/Yes	Confidential	1-Octanesulphonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadeca fluoro-, potassium salt CAS No. 2795-39-3	>> 10	Unknown	Confidential	-
		Confidential	Glycine, N-ethyl-N-[(heptadeca fluorooctyl) sulphonyl]-, potassium salt CAS No. 2991-51-7	>> 10	Unknown	Confidential	-
		Confidential	1-Octanesulphonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,,8,8-heptadeca fluoro-, ammonium salt CAS No. 56773-42-3	>> 10	Unknown	Confidential	-
		Confidential	Ethanaminium,N,N',N'' -triethyl-, salt with 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro -1-octanesulphonic acid (1:1) CAS No. 56773-42-3	>> 10	Unknown	Confidential	-
Poland	No/No	-	-	-	-	-	-

[40] Some use has been registered, but Norway does not know whether it is pure PFOS or in mixtures. Most of the use areas are confidential or probably not discovered yet

Question 2 (continued)

	Manufacture /Import	Product/ mixture name	PFOS Chemical Name/ CAS No.	Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year	Conc. of Substance in Product/ mixture	Known Uses of the Product/mixture	Specify if Industrial and/or Consumer use, if possible
Slovenia	No/Yes	Raid formiche	Litium perfluoro-octane sulfonate CAS No. 29457-72-5	692,08	<0.1%	Biocid	Consumer
		Chrombad-Netzmittel FT 248	Perfluorooctane sulfonate	25	5%	Wetting agent	Industrial
Sweden[41]	Yes/Yes	*	CAS No. 68608-14-0	Import*	*	*	Industrial
		*	CAS No. 56773-42-3	Manufact. /import 36 300	0.001 ~ 50	Galvano-technical agents; raw materials.	Industrial
		*	CAS No. 2991-51-7	Import/ manufact. 622 000	0.002 ~ 0.24	Wax & other polishing preparations cleaning agents.	Industrial/ consumer
		*	CAS No. 2991-51-7	Manufacture /import*	*	*	Industrial
		*	CAS No. 2795-39-3	Manufacture*	*	*	Industrial
		*	CAS No. 2795-39-3	Import*	*	*	Industrial
		*	CAS No. 383-07-3	Manufacture*	*	*	Consumer
		*	CAS No. 383-07-3	Manufacture*	*	*	Consumer
		*	CAS No. 70225-14-8	Import*	*	*	Industrial
Switzerland	Yes/Yes[42]						
UK[43]	-	-	-	-	-	-	-
US[44]	No/Yes	-	-	-	-	-	-

[41] "*" data could not be disclosed due to secrecy reasons: ≤ 3 companies have reported the marketing of the product containing the substance.

[42] See information included in Question 1 and the notes to Table 1 for Switzerland.

[43] UK is not been able to distinguish between the imports of substances and preparations. See Table 1.

Question 3: The Uses for PFOS and PFOS-Related Substances and/or Products/Mixtures for which No Suitable Alternatives Are Available.

Country	Comment
Australia	Essential uses reported to date in Australia include use of PFOS as an ingredient in certain aqueous film forming foam (AFFF) and alcohol type fire fighting foams. AFFF and ATC fire fighting foam is used to extinguish Class B fires. No other essential uses of PFOS and its derivatives are reported in Australia.
Belgium Belgium[45]	Photographic industry, electronics industry (semi-conductors), aviation hydraulic fluids. 3M is not aware of alternatives for products used in aviation hydraulic fluid and in certain photographic and electronics applications.
Canada	Not determined.
Finland	Although the use of products containing PFOS/PFOS-related substances is quite limited in Finland, the known uses are mainly connected to metal plating and photolithography processes in semiconductor industry as well as hydraulic fluids for aircrafts and it is obvious that the same difficulties to find substitutes for these purposes that came up in UK study apply also to the Finnish situation.
New Zealand	Information provided by a company: products used in aviation hydraulic fluid and in certain photographic and electronic applications.
Norway	The main uses for PFOS and PFOS related substances in Norway are not completely investigated. Therefore they cannot answer this question.
Switzerland	See in annexed Table A1 well as Tables 1 and 2.
UK	Uses are; 1) chromium plating (mist suppressants), 2) semiconductors (photolithography), 3) aviation hydraulic fluids, and 4) photographic anti-static agents. UK has evaluated all uses of PFOS related substances and is confident that alternatives either exist or can be developed except for aviation hydraulic fluids.
US	In a Final Rule published 9 December 2002 (67 FR 72854), the U.S. excluded from regulation PFOS-related substances used (1) as an anti-erosion additive in fire-resistant phosphate ester aviation hydraulic fuels; (2) as a component of a photoresist substance, or as a component of an anti-reflective coating, used in a photomicrolithography process to produce semiconductors or similar components of electronic or other miniaturized devices; (3) in coatings for surface tension, static discharge, and adhesion control for analog and digital imaging films, papers, and printing plates, or as a surfactant in mixtures used to process imaging films; or (4) as an intermediate only to produce other chemical substances to be used solely for the three foregoing uses. Each of these excluded uses involves applications in which no suitable alternatives for PFOS and PFOS-related substances are available.
EU	See annexed **Table A2**, the uses found for PFOS and PFOS-related substances.

[44] The U.S. has no information concerning specific products/mixtures containing PFOS or PFOS-related substances being imported into the U.S. However, the U.S. anticipates that importation of limited volumes of such products/mixtures is occurring to support the specific industrial uses excluded from the PFAS SNUR, in the areas of aviation hydraulic fluids, semiconductor and electronics manufacture, and imaging.

[45] Information provided by 3M.

Question 4. Other Substances and/or Products/Mixtures Used as Replacements for PFOS and PFOS-Related Substances and/or Mixtures

Country	Comment
Australia	Relates to confidential information which precludes disclosure.
Belgium Belgium[46]	Confidentiality problem for information provided by chemicals producers/processors. Over the past few years, 3M developed new technologies that can be used to produce products as substitutes for some of the phased-out PFOS-related products. For example, at this time 3M has commercialized substitutes for protective treatment of carpet, textiles & leather, fluoropolymers and for chemical surfactants. One of the technologies utilizes a C4 building block compound. 3M has developed a substantial database of information on perfluorobutane sulfonate (PFBS). The results of physical, chemical and environmental fate testing, ecological toxicity studies and mammalian toxicity studies on PFBS indicate that the compound has very low toxicity and a very low potential to bioaccumulate. The bioconcentration factor of PFBS is less than one (<1). All of the study results have been shared with the US EPA and the new substances are being commercialized in the US under a testing consent agreement with US EPA. The substances are also commercialized in Europe.
Canada	This is currently being established. Alternatives may include perfluorobutane sulfonate substances as well as hydrocarbon-based surfactants and silicone-based surfactants. It is expected other fluorosurfactants are being used.
Cyprus	No substances and/or products/mixtures are known to be used as replacements for PFOS and PFOS-related substances.
New Zealand	A company is developing new technologies as substitutes for some phased-out PFOS-related products. One of these technologies utilizes a C4 building block compound, perfluorobutane sulfonate, which has very low toxicity and potential to accumulate.
Norway	This has not been investigated yet. Norway knows that PFAS have replaced PFOS-related substances in fire fighting foams.
Switzerland	The survey in Switzerland was not able to deliver detailed information about replacements for PFOS and PFOS-related substances. According to industry, 3M replaces C-8 chemistry with C-4 chemistry.
UK	Replacements have been developed for PFOS related substances used in fire-fighting foams. These include non-PFOS fluorosurfactants, silicone and hydrocarbon based surfactants, and fluorine free fire-fighting foams.
US	The specific identities of replacements or substitutes for PFOS and PFOS-related substances and mixtures have been claimed as Confidential Business Information (CBI) to the extent they have been disclosed to the U.S. government. Generally speaking, however, these substances and mixtures have included other perfluoroalkyl sulfonates (PFAS) and various fluorinated telomers.

[46] Information provided by 3M.

Question 5: Any New Uses of PFOS and PFOS-related/PFOS-Based Substances and Products/Mixtures Containing These Substances

Country	Comment
Australia	Nil other than as an impurity in a specialised industrial additive (See Table 2).
Belgium Belgium[47]	- None
Canada	Canada is unaware of any new uses.
Cyprus	None
Finland	There should not be any new uses of PFOS/PFOS-related substances in Finland to report.
Norway	Norway has no knowledge on about any new uses of PFOS.
Switzerland	Refer Tables 1 & 2.
UK	None UK is aware of.
US	None

[47] Information provided by 3M.

Question 6: Importation/Manufacture of PFAS and PFAS-Related Substances (Table 3):[48]

	Manufacture (yes/no)/ Import (yes/no)	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
Australia[49]	No/No	-	-	-	-
Belgium	Yes[50] Yes/Yes[51]				
Bulgaria	Yes/Yes	Other sulphonamides CAS No. 4151-50-2 (Customs code: 2935 0090 9)	Production: (#)[52] Import: 48 923 (55 699 for year 2002)	n/a n/a	n/a n/a
Canada	No/-[53]				
Finland	No/no	-	-	-	-

[48] PFAS-related chemicals may be simple salts or polymers that contain the PFAS as only a portion of the entire polymer. For the purpose of this table, this group includes PFAS and PFAS-related substances other than PFOS and PFOS-related substances.

[49] Australia notes as PFAS and PFAS-based chemical ingredients may not be mentioned on Material Safety Data Sheets, some importers may not know if products/mixtures contain PFAS.

[50] See Question 1 and the notes to Table 1 for Belgium.

[51] Information provided by a company. See also Question 7, where a joint answer is given for both substances and products/mixtures (or preparations).

[52] The available data are confidential according to Art. 26 and Art. 27 of Law on Statistics (SG 57/1999, as amended in SG 42/2001, 45/2002, 74/2002) – National Statistical Institute.

[53] Import: not determined.

Question 6 (continued)

	Manufacture/ Import	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
Germany[54]	Yes/No				
	Company 1	Perfluorbutanesulfonylfluoride CAS No. 375-72-4	30 000 ~ 50 000	Intermediate for the production of PFAS related substances, fluorinating agent.	Industrial
		Potassiumperfluorbutanesulfonate CAS No. 29420-49-3	30 000 ~ 50 000	Flame retardant, intermediate for the production of catalysts.	Industrial[55]
		Bis-[2-(N.methylperfluorbutane-sulfonamido)ethoxy]phosphoric acid ester CAS No. 120945-47-3	20 000 ~ 50 000	Defoamer in electroplating industry.	Industrial
	Company 3	C4 PFAS-related substance CAS No: confidential.	< 500	Manufacturing intermediate.	Industrial
Hungary	No/No	-	-	-	-

[54] See Question 1 and the notes to Table 1 for Germany.

[55] Parts of the resulting products may be placed on the consumer marked.

Question 6 (continued)

	Manufacture/ Import	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
Italy	Yes/-	1 Exanesulfonyl fluoride, 1,1,2,2,3, 3,4,4,5,5,6,6,6 tridecafluoro- CAS No. 423-50-7	< 4.000	Unknown	Industrial
		1 Exane sulfonic Acid, 1,1,2,2,3, 3,4,4,5,5,6,6,6 tridecafluoro-potassium aalt CAS No. 3871-99-6	< 1.500	Unknown	Industrial
		Cicloexane sulfonic acid, Decafluoro, (Pentafluoroethyl)-potassium salt CAS No. 67584-42-3	<1.200	Fire resistant, hydraulic fluid.	Industrial/ aircraft
		1 Exane sulfonic acid amide, 1,1,2,2, 3,3,4,4,5,5,6,6,6 tridecafluoro- CAS No. 41999-13-1	600	Unknown	Industrial
Japan	No/No	-	-	-	-
New Zealand[56]	No/n/a				

[56] See Question 1 and the notes to Table 1 for New Zealand.

Question 6 (continued)

	Manufacture/ Import	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
Norway	No/Yes[57]	Propenoic aicd, 2-3,3,4,4,5,5,6,6,7,7, 8,8,9, 9,10,10,11,11,12,12,12-Heneicosafluorododecyl ester, polymer with 3,3,4,4,5,5,6,6,7,7,8,8, 9,9,10,10,10-heptadecafluorodecyl 2-propenoate, hexadecyl 2-propenoate, N(hydroxymethyl)- 2-propenamide, octadecyl 2-pro CAS No. 115592-83-1	Unknown	-	-
		Propanaminium, 3(((heptadeca fluorooctyl)sulfonyl)amino)-N,N,N, trimethyl-, iodide, 1- CAS No. 1652-63-7	Unknown	-	-
		Oktansulfonamide 1, N-etyl-1,1,2,2, 3,3,4,4,5,5,6,6,7,7,8,8,8-heptadeca fluoro-N-(2-hydroksyetyl)- CAS No. 1691-99-2	Unknown	-	-
		Nonanesulfonic acid, 1,1,2,2,3,3,4,4, 5,5,6,6,7,7,8,8,9,9,-Nonadedecafluoro-, ammonium salt (C9-H-F19-O3-S.H3-N) CAS 17202-41-4	Unknown	-	-
		Kaliumperfluoroktansulfonat CAS No. 2795-39-3	Unknown	-	-

[57] Norway does not have information on whether the import is as pure PFAS or mixtures.

Question 6 (continued)

	Manufacture/ Import	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
	No/Yes	Poly(oksi-1, 2-etandiyl), alfa-(2-(etyl (heptadekafluoroktyl)sulfonyl) amino)-etyl)-omega-hydroksi- CAS No. 29117-08-6	Unknown	-	-
		Butansulfonsyre, 1,1,2,2,3,3,4,4, -nonafluoro-1-, kalium salt CAS No. 29420-49-3	Unknown	-	-
		Glycine, N-ethyl-N-((heptadecafluro octyl)sulfonyl)-, potassium salt CAS No. 2991-51-7	Unknown	-	-
		Phosphinicobis(oxy-2,1-ethanediyl) bis(N-ethyl-1,1,2,2, 3,3,4,4,5,5,6,6, 7,7,8,8,8-heptadecafluoro-1-octan sulphonamide, ammonium salt, N,N'- CAS No. 30381-98-7	Unknown	-	-
		Carboxymethyldimethyl-3-[[(3,3, 4,4,5,5,6,6,7,7,8,8,9,9,-tridecafluorooctyl)sulphonyl]amino] propylammonium hydroxide CAS No. 34455-29-3	Unknown	-	-
		Propanaminium,3-(((heptadeca fulorooctyl)sulfonyl)amino)-N,N,N-trimetyl-1,chloride (C14H16F17N2O2S.Cl) CAS No. 38006-74-5	Unknown	-	-

Question 6 (continued)

	Manufacture/ Import	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
	No/Yes	Ammonium pentadecafluoro octanoate CAS No. 3825-26-1	Unknown	-	-
		Pentansulfonsyre, 1,1,2,2,3,3,4,4,5, 5,5-undekafluoro-1-, kalium salt CAS No. 3872-25-1	Unknown	-	-
		Butandioic acid, sulfo, (3,3,4,4,5,5, 6,6,7,7,8,8,8, tridecafluorooctyl) estersodium salt CAS No. 54950-05-9	Unknown	-	-
		Poly(oksi-1,2-etandiyl), alfa-(2-(etyl ((tridekafluorheksyl)sulfonyl)amino) etyl)-omega-hydorksi- CAS No. 56372-23-7	Unknown	Confidential	-
		Ethanaminium,N,N,N-triethyl-, salt with 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8, -heptadecafluoro-1-octanesulfonic acid (1:1) CAS No. 56773-42-3	Unknown	Confidential	-
		Heptansulfonsyre-1,1,2,2,3,3,4,4, 5,5,6,6,7,7,7- pentadekafluoro-1-, kalium salt CAS No. 60270-55-5	Unknown	Confidential	-
		Poly(difluromethylene), alpha.-fluro.-omega.-(2-(2-methyl-1-oxo-2-propenyl)oxy)ethyl)- CAS No. 65530-66-7	Unknown	Confidential	-

Question 6 (continued)

	Manufacture/ Import	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
	No/Yes	Poly(difluoromethylene)alpha(2-((2-carboxyethyl)thio)ethyl)-w-fluoro-, lithium salt CAS No. 65530-69-0	Unknown	Confidential	-
		Poly(difluoromethylene), alfa, alfa-(phosphinicobis(oxy-2,1-ethanediyl))bis(omega-fluoro-, ammonium salt CAS No. 65530-70-3	Unknown	Confidential	-
		Poly(difluoromethylene), alfa-fluoro-omega-(2-(phosphonoxy) ethyl)-, monoammonium salt CAS No. 65530-71-4	Unknown	Confidential	-
		Poly(difluoromethylene), alfa-fluoro-omega-(2-(phosphonoxy) ethyl)-, diammonium salt CAS No. 65530-72-5	Unknown	Confidential	-
		Poly(oxy-1, 2-ethanediyl), alpha, hydro-, omega, -hydroxy-, ether with alpha, fluoro-, omega,-(2-(hydroxyethyl)poly(difluoromethy lene) (1:1) CAS No. 65545-80-4	Unknown	Confidential	-
		Poly(difluoromethylene), alpha-fluoror-omega-(2-((1-0x0-2-propenyl)oxy)ethyl) CAS No. 65605-70-1	Unknown	Confidential	-

Question 6 (continued)

	Manufacture/ Import	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
	No/Yes	Cyclohexanesulfonic acid, decafluoro(pentafluoroethyl)-, potassium salt CAS No. 67584-42-3	Unknown	Confidential	-
		Glycin, N-ethyl-N-((nonafluoro butyl)sulfonyl), kalium salt CAS No. 67584-51-4	Unknown	Confidential	-
		Glycin, N-ethyl-N-((undekafluoro pentyl)sulfonyl), kalium salt CAS No. 67584-52-5	Unknown	Confidential	-
		Glycin, N-ethyl-N-((tridekafluoro heksyl)sulfonyl), kalium salt CAS No. 67584-53-6	Unknown	Confidential	-
		Glycin, N-ethyl-N-((pentadeka fluoroheptyl)sulfonyl), kalium salt CAS No. 67584-62-7	Unknown	Confidential	-
		Decanesulfonic acid, 1,1,2,2,3,3,4,4, 5,5,6,6,7,7,8,8,9,9,10,10-heneico-safluoro-, ammonium salt (C10-H-F21-O3-S.H3-N), 1- CAS No. 67906-42-7	Unknown	Confidential	-
		Octansulfonamide, N-ethyl-1,1,2,2, 3,3,4,4,5,5,6,6,7,7,8,8-heptadeca fluoro-N-(2-(phosphonooxy)ethyl)-1, diammonium salt CAS No. 67969-69-1	Unknown	Confidential	-

Question 6 (continued)

	Manufacture/ Import	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
	No/Yes	Propensyre, 2-(butyl((heptadeca fluorooktyl)sulfonyl)amino)etyl ester, telomer med 2-(butyl(penta decafluoroheptyl)-sulfonyl)amino) etyl, 2-propeonat, metyl oksiran polymer med oksiran di-2-propeo nat, metyl oksiran polymer med oksiran mono-2-propeonat og 1-O CAS No. 68298-62-4	Unknown	Confidential	-
		Poly(oksi-1,2-etandiyl), alfa-(2-etyl ((nonafluorbutyl)sulfonyl)amino) etyl)-omega-hydroksi-((C2H4O)nC8 H10F9NO3S) CAS No. 68298-79-3	Unknown	Confidential	-
		Poly(oky-1,2-etandiyl), alfa-(2-etyl ((undekafluoropentyl)sulfonyl) amino) ethyl)-omega-hydroxy- ((C2H4O)nC9 H10F11NO3S) CAS No. 68298-80-6	Unknown	Confidential	-
		Poly(oksi-1,2-etandiyl), alfa-(2-etyl ((pentadecafluorheptyl)sulfonyl) amino)etyl)-omega-hydroksi- CAS No. 68298-81-7	Unknown	Confidential	-

Question 6 (continued)

	Manufacture/ Import	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
	No/Yes	Krom, diaquatetraklor(.mu.-(N-etyl-N-((peptadekafluorooktyl)sulfonyl) glycinato-01:01'))-.mu.-hydroksybis (2-metylpropanol)di- CAS No. 68891-96-3	Unknown	Confidential	-
		Poly(oxy-1,2-etandiyl), a-(2-etyl ((heptadekafluorooktyl)sulfonyl) amino)etyl)-w-metoksy- CAS No. 68958-61-2	Unknown	Confidential	-
		Heptadekafluorooctanesulphonic acid, compound with 2,2'-iminodiethanol (1:1) CAS No. 70225-14-8	Unknown	Confidential	-
		Propanaminium, 2-hydroxy, N,N,N-trimethyl-, 3-(gamma-omega-perfluoro-C6-20-alkyl)thio)derives, chlorides, 1- CAS No. 70983-60-7	Unknown	Confidential	-
Poland	No/Yes	1,1,2,2,3,3,4,4,4-nonafluorobutane-1-sulphonyl fluoride CAS No. 375-72-4	0.025	Reagent	-
Sweden	No/No	-	-	-	-

Question 6 (continued)

	Manufacture/ Import	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
Switzerland[58]	No[59]/Yes	CAS No. 70225-18-8	n/a	Solvent, emulsifier, diluting agent, paint stripper, surfactant, Cr metal plating/ galvanic agent.	Indust. (8).[60]
		CAS No. 2991-51-7	n/a	Paint, emulsifier, stone floor polishing/car polish/water repellence/ cleaning/ disinfection agents, biostatica, shoe & leather protection agent, adhesives, cement, paint.	Consum.(64), indust. (138).
		CAS No. 1652-63-7	n/a	Paint.	Indust. (2).
		CAS No. 38006-74-5	n/a	Cleaning agents.	Consum. (2).
		CAS No. 65530-69-0	n/a	Paints, metal treatment agents, surfactant, shoe & leather protection/floor polishing agent.	Consum.(2), indust. (12).
		CAS No. 65530-83-8	n/a	Dito.	Consum.(2), indust. (9).
		CAS No. 17741-60-5	n/a	Water repellence agent.	Consum. (1).
		CAS No. 27905-45-9	n/a	Water repellence agent.	Consum. (1).
		CAS 65605-70-1	n/a	Water repellence agent.	Consum. (1).

[58] Based on survey of Swiss Product Register, which includes both PFAS and PFAS-related substances, and products/mixtures containing PFAS or PFAS-related substances. The data bank can not prove that registered substances or products are still in use. See Question 1, note to Table 1 for Switzerland and annexed Table A1.

[59] This is not proved in detail.

[60] Number in brackets indicated number of actual registered products.

Question 6 (continued)

	Manufacture/ Import	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
	No/Yes	CAS No. 65545-80-4	n/a	Paints, auxiliary agents, surfactant, cleaning/car polish/water repellence/ floor surface treatment/ photographical agents.	Consum.(4), indust. (13).
		CAS No. 68586-14-1	n/a	(3M-products, according to 3M not any more in use)	-
		CAS No. 34395-24-9	n/a	Natural stone sealing agent (register date: Feb. 2004)	Consum./ indust. (1).
		CAS No. 53515-73-4	n/a	Water repellence agent (register date: Feb. 2004)	Consum./ indust. (1).
US	Yes/Yes[61]	n/a	n/a	n/a	n/a
EU	Yes	(2-hydroxyethyl)dimethyl[3-[(3-sulphopropyl)[(tridecafluorohexyl) sulphonyl]amino]propyl] ammonium hydroxide CAS No. 38850-58-7	< 1 000 000 (since 1996)	-	-
		Perfluorohexanesulphonyl fluoride CAS No. 423-50-7	< 1 000 000 (since 1996)	-	-
		Potassium 1,1,2,2,3,3,4,4,4-nonafluorobutane-1-sulphonate[62] CAS No. 29420-49-3	< 1 000 000 (since 2000)	-	-

[61] Non-PFOS-related PFAS and PFAS-related substances of varying carbon chain lengths are both manufactured in and imported into the U.S. At this time, however, the U.S. has no information that it is able to share concerning the specific identities or production/importation volumes of these substances. Many chemical identities and production volumes are reported as confidential business information. Additionally, these substances may be manufactured or imported in volumes below regulatory reporting thresholds.

[62] Not in the US EPA list.

Question 6

	Manufacture/ Import	PFAS Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
	n/a	1,1,2,2,3,3,4,4,4-nonafluorobutane-1-sulphonyl fluoride[62] CAS No. 375-72-4	< 1 000 000 (since 2000)	-	-
		3-[[3-(dimethylamino)propyl] [(tridecafluorohexyl)sulphonyl] amino]propanesulphonic acid[62] CAS No. 38850-60-1	< 1 000 000 (since 1994)	-	-
		Trifluoromethanesulphonic acid[62] CAS No. 1493-13-6	< 1 000 000 (since 1991)	-	-

Question 7: Importation/Manufacture of Products/Mixtures Containing PFAS or PFAS-Related Substances (Table 4)

	Manufacture (yes/no)/ Import (yes/no)	Product/ mixture name	PFAS Chemical Name/ CAS No.	Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year	Conc. of Substance in Product/ mixture	Known Uses of the Product/mixture	Specify if Industrial and/or Consumer use, if possible
Australia[63]	No/Yes	3 products containing PFAS-related chemicals & polymers	-	< 6 000 (as PFAS)	Confidential	Mist suppressant, carpet treatment, surface coatings.	Industrial & consumer
Belgium	Yes[64] Yes/Yes[65]	-	-	-	-	-	-
Bulgaria	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Canada	No/-[66]						
Cyprus[67]	No/Yes						
Finland	No/No	-	-	-	-	-	-
Italy	No/No	-	-	-	-	-	-

[63] Polymers containing PFAS-based chemicals.

[64] See Question 1 and the notes to Table 1 for Belgium.

[65] Information provided by a company. This company currently manufactures/imports several products containing PFAS related substances which are sold as leather, carpet & textile impregnation agents, surfactants, battery components, miscellaneous fluoropolymers and intermediates. These products contain either C1 or C4 PFAS-related substances and some of those are (high molecular weight) polymers of which the PFAS related substance is only 1 out of several other monomers and reactants. For all currently commercially available PFAS-related substances containing products the amount of manufactured/imported PFAS-related substances by this company is < 500 000 kg.

[66] Import: not determined.

[67] See Question 2 and the notes to Table 2 for Cyprus.

Question 7 (continued)

	Manufacture /Import	Product/ mixture name	PFAS Chemical Name/ CAS No.	Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year	Conc. of Substance in Product/ mixture	Known Uses of the Product/mixture	Specify if Industrial and/or Consumer use, if possible
Japan	No/No	-	-	-	-	-	-
New Zealand[68]	No/n/a						
Norway[69]	No/Yes						
Poland	No/No	-	-	-	-	-	-
Slovenia	No/Yes	Fumetrol	Tetraethylammoniumheptadeka-Fluorooctane Sulphonate CAS No. 56773-42-3	800	10%	Wetting agent	Metal finishing
Sweden[70]	Yes/Yes	* * *	CAS No. 67584-42-3 CAS No. 67906-42-7 & CAS No. 67584-83-6	Import* Import/ manufact. 38 000 (total)	* 0.0005 ~ 0.025	* Wax & other polishing preparations washing agents.	Industrial Industrial/ consumer
Switzerland	Yes/Yes[71]	-					

[68] See Question 1 and the notes to Table 1 for New Zealand.

[69] Norway does not have information on whether the import is as pure PFAS or in mixtures. See Question 6.

[70] "*" data could not be disclosed due to secrecy reasons: ≤ 3 companies have reported the marketing of the product containing the substance.

[71] Based on survey of Swiss Product Register, which includes both PFAS and PFAS-related substances, and products/mixtures containing PFAS or PFAS-related substances. The data bank can not prove that registered substances or products are still in use. . For historical reasons, also generic terms instead of univocal substance names with CAS numbers were partially used. Due to this feature of the data bank it also can not be guaranteed that all substances in use are detected in the search See Table 3 and annexed Table A1.

Question 7 (continued)

	Manufacture /Import	Product/ mixture name	PFAS Chemical Name/ CAS No.	Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year	Conc. of Substance in Product/ mixture	Known Uses of the Product/mixture	Specify if Industrial and/or Consumer use, if possible
US	Yes/Yes[72]	n/a	n/a	n/a	n/a	n/a	n/a

[72] Products/mixtures containing non-PFOS-related PFAS and PFAS-related substances of varying carbon chain lengths are both manufactured in and imported into the U.S. At this time, however, the U.S. has no information that it is able to share concerning the specific identities or production/importation volumes of these products/mixtures. Many chemical identities and production volumes are reported as confidential business information. Additionally, these substances may be manufactured or imported in volumes below regulatory reporting thresholds.

Question 8: Importation/manufacture of PFOA and PFOA-related substances (Table 5):[73]

	Manufacture (yes/no)/ Import (yes/no)	**PFOA Chemical Name/ CAS No.**	**Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year**	**Known Uses of the Chemical**	**Specify if Industrial and/or Consumer use**
Australia	No/No	-	-	-	-
Belgium[74]	Yes				
Bulgaria	n/a/Yes	Palmitic acid, stearic acid, their salts and esters CAS No. 307-24-4 CAS No. 375-58-9 CAS No. 375-95-1 (Customs code: 2915 9080 0)	Production: None Import: 212 458 (232 504 for year 2002)	- n/a	- n/a
Canada	No/Yes[75]				
Cyprus	No/No	-	-	-	-
Finland	No/No	-	-	-	-
France[76]	Yes	Carboxylic acids, C7-C13, perfluoro, ammonium salts CAS No. 72968-38-8	Confidential	Surfactant in the polymerisation process of polyvinylidene fluoride	Industrial

[73] PFOA-related chemicals may be simple salts of PFOA, *e.g.*, sodium, potassium, silver, ammonium, or polymers that contain PFOA as only a portion of the entire polymer.

[74] See Question 1 and the notes to Table 1 for Belgium.

[75] Specific details are currently not publicly available.

[76] The response is from Chemical Industry Association.

Question 8 (continued)

	Manufacture/ Import	PFOA Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
Germany	No/Yes Company 3	CAS No. 3825-26-1	For 2003/2004 Use: < 50 000 Import: < 10 000 Future replenishment: < 5 000	Essential emulsifier for polymerisation of fluoropolymers.	Industrial
Italy	Yes/-	Octanoic acid pentadecafluoro- CAS No. 335-61-1	< 1.000	Polymer processing aids, photographic film.	Industrial
		Octanoic acid pentadecafluoro ammonium salt CAS No. 3825-26-1	< 36.000	Polymer processing aids, photographic film.	Industrial
Japan	Yes/Yes	Pentadecafluorooctanoic acid CAS No. 335-67-1	< 100 000[77]	Semiconductors, etc.	Industrial
		Ammonium perfluorooctanate CAS No. 3825-26-1	< 100 000	Polymer production, etc.	Industrial
		Lithium heptadecafluorooctane sulphonate CAS No. 29457-72-5	< 100 000	Surfactant, etc.	Industrial
		Potassium heptadecafluorooctane-1-sulphonate CAS No. 2795-39-3	< 100 000	Surfactant, etc.	Industrial

[77] The regulation stipulates that it does not release the specific numerical volume of import/manufacture of PFOA and its related substances if the total volumes of them do not exceed 100 000 kg/year.

Question 8 (continued)

	Manufacture/ Import	**PFOA Chemical Name/ CAS No.**	**Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year**	**Known Uses of the Chemical**	**Specify if Industrial and/or Consumer use**
New Zealand[78]	No/n/a				
Poland	No/Yes	Heptadecafluoro-1-iodooctane CAS No. 507-63-1 Tetraethylammonium heptadeca fluorooctanesulphonate CAS No. 56773-42-3	0.0501 0.100 (0.005 for year 2002)	Reagent Reagent	- -
Sweden	No/No	-	-	-	-
Switzerland[79]	No/Yes	CAS No. 3825-26-1 CAS No. 335-67-1	n/a n/a	Paints, auxiliary. Textile cleaning/general chemical/flux agent.	Industrial (3)[80] Industrial (3)
UK	Yes[81]	n/a	n/a	n/a	n/a

[78] See Question 1 and the notes to Table 1 for New zealand.

[79] Based on survey of Swiss Product Register, which includes both PFOA and PFOA-related substances, and products/mixtures containing PFOA or PFOA-related substances. The data bank can not prove that registered substances or products are still in use. . For historical reasons, also generic terms instead of univocal substance names with CAS numbers were partially used. Due to this feature of the data bank it also can not be guaranteed that all substances in use are detected in the search

[80] Number in brackets indicated number of actual registered products.

[81] Detailed information is not available.

Question 8 (continued)

	Manufacture/ Import	PFOA Chemical Name/ CAS No.	Manufacture/Import Volume range of Chemical (kg) for 2003 calendar year	Known Uses of the Chemical	Specify if Industrial and/or Consumer use
US	Yes/-[82]	Octanoic acid, pentadecafluoro-, ammonium salt (also Ammonium perfluorooctanoate, or APFO) CAS No. 3825-26-1	Confidential; Total U.S. manufacturing capacity less than 660,000 lbs (300,000 kg; data source, AR226-1094)	Manufacture of fluoropolymer dry resins and aqueous dispersions	Industrial. End use products made from fluoropolymers have both industrial and commercial uses
EU	Yes	Pentadecafluorooctanoic acid CAS No. 335-67-1 Ammonium pentadecafluoro octanoate CAS No. 3825-26-1	< 1 000 000 (since 1994) < 1 000 000 (since 1996)	- -	- -

[82] Certain fluorinated telomer chemicals manufactured in and imported into the U.S. may also be PFOA-related substances. Limited data indicate that the 8-2 telomer alcohol (CAS. No. 673-39-7, 1-Decanol,3,3,4,4,5,5,6,6,7,7,8,8,10,10,10-heptadecafluoro) metabolises and degrades to PFOA. Additional research is underway to determine whether other telomer chemicals can degrade similarly to PFOA. Specific telomer chemical identities and the production and importation volumes associated with those chemical identities are claimed as confidential business information (CBI) in the U.S. and cannot be reported here. Non-CBI preliminary aggregate data reported to the U.S. on November 25, 2002 by the Telomer Research Program (AR226-1141) identified global Telomer A [$F(CF_2CF_2)_nI$, where n = 2-8] equivalents produced in 2000-2002 at approximately 5 to 6.5 million kg/year, with 40% of that product distribution in the U.S. The following chart presents the carbon chain length distribution of that total production.

	C4	C6	C8	C ≥ 10	Total
% of Telomer Production	4%	16%	46%	33%	100%
Polymer	99%	45%	85%	88%	80%
Non-Polymer	1%	55%	15%	12%	20%

Question 9: Importation/Manufacture of Products/Mixtures Containing PFOA or PFOA-Related Substances (Table 6)

	Manufacture (yes/no)/ Import (yes/no)	**Product/ mixture name**	**PFOA Chemical Name/ CAS No.**	**Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year**	**Conc. of Substance in Product/ mixture**	**Known Uses of the Product/mixture**	**Specify if Industrial and/or Consumer use, if possible**
Australia	No/Yes	6 PFOA-related polymers/ telemer containing	-	27 500 as PFOA related monomer	Variable	Surface coatings, textile treatment	Industrial
Belgium	Yes[83] Yes/Yes[84]	Confidential	CAS No. 3825-26-1	< 50 000	0.1% & 30%	Intermediate.	Industrial
Bulgaria	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Canada	No/n/a						
Cyprus[85]	No/Yes						
Finland	No/No	-	-	-	-	-	-

[83] See Question 1 and the notes to Table 1 for Belgium.

[84] Information provided by a company.

[85] See Question 2 and the notes to Table 2 for Cyprus.

Question 9 (continued)

	Manufacture/ Import	Product/ mixture name	PFOS Chemical Name/ CAS No.	Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year	Conc. of Substance in Product/ mixture	Known Uses of the Product/mixture	Specify if Industrial and/or Consumer use, if possible
France	Yes[86]	Polyvinylidene fluoride	Surflon-111 S.WB CAS No. 72968-38-3	Confidential	< 2ppm[89]	Chemical indust.: tubes & fittings, Semiconductors: buildings, cables, isolation.	Industrial
	No/Yes[87]	Aqueous dispersions of PTFE (polytetra fluoroethylne) & PFA	Ammonium salt of PFOA CAS No. 3825-26-1	-[88]	< 0.1% (PTFE) < 0.1% (PFA)	Coating products (frypan, sauce pan, …) as non-stick coating. Non-stick coating in many electrical appliances (barbecue, sandwich makers, fryers, …)	Indust.[90, 91]

[86] Information provided by the Chemical Industry Association.

[87] Information provided by a small household appliances manufacturer.

[88] Aqueous dispersion of PTFE (60% PTFE – 40% water), aqueous dispersion of PFA (50% PFA – 50% water).

[89] 200 ppm of total surfactant which is approximately less than 2 ppm of PFOA in the polymeric matrix.

[90] PFOA is not present in any of their finished goods. The non-stick coating of articles used by consumers does not contain PFOA, as PFOA is totally burned during industrial thermal transformation at 400 - 420°C. It has been proved by three independent analyses, available on request.

[91] At the end of 2000 asked their suppliers of aqueous dispersions of PTFE to study new dispersions of PTFE and PFA with reduce concentration of PFOA. They have approved, at the end of 2003, only one type of dispersion of PTFE with a low concentration of PFOA (between 30 - 100ppm = 0.003 - 0.01%), this new dispersion of PTFE is used. Four others are in test and two dispersions could be approved at the end of 2004. Unless the drastic reduction of concentration of PFOA in the preparations, it appears that they cannot manufacture non-stick coating without a small amount of PFOA.

Question 9 (continued)

	Manufacture/ Import	Product/ mixture name	PFOS Chemical Name/ CAS No.	Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year	Conc. of Substance in Product/ mixture	Known Uses of the Product/mixture	Specify if Industrial and/or Consumer use, if possible
Germany	Yes/No Company 3 Company 4	Aqueous fluoropolymer dispersions. -[92]	CAS No. 3825-26-1 Perfluoroalkyl surfactant	Confidential 30 000	0.5%[93] 0.004%	Coatings[94] Corrosion protection.	Industrial Strictly industrial
Italy	Yes/No	Algoflon (PTFE) dispersions	Ammonium perfluoro octanoate CAS No. 3825-26-1	2 700 000	0.07 – 0.08%	Metal coating, glass fiber impregnation additives of plastic resins.	Industrial
Japan	Yes[95]	-	-	-	-	-	-
New Zealand[96]	No/Yes[97]						

[92] Trade name kept confidential.

[93] The company has developed and is currently implementing technologies to remove the ammonium salt of PFOA from aqueous dispersion products of fluoropolymers to a content less than 100 ppm. The company is committed to transfer all products to that standard by 2005. The APFO removed from these dispersions is recovered and recycled.

[94] During processing, coating products are thermally treated(sintered) to develop the final coating properties, consequently, the PFOA is removed and destroyed.

[95] Although potassium, lithium, ammonium, diethanolamine, or polymers may be subject to this questionnaire, Japan does not take them into account in its answer since it is difficult to figure out a precise picture of PFOA-related substances, and Japan does not have enough result of hazard assessments of each PFOA-related substance. Therefore, Japan is not able to provide the detail of Table 6.

[96] See Question 1 and the notes to Table 1 for New Zealand.

[97] A company imported a quantity of primer paints that contained a total 4.25 grams of PFOA in total in 2003.

Question 9 (continued)

	Manufacture/ Import	Product/ mixture name	PFOS Chemical Name/ CAS No.	Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year	Conc. of Substance in Product/ mixture	Known Uses of the Product/mixture	Specify if Industrial and/or Consumer use, if possible
Poland	No/No	-	-	-	-	-	-
Slovenia	No/Yes	Hostaflon TF 5039 Dicrylan 7581	Ammoniumpentadecafluorooktanoat CAS No. 3825-26-1 Ammoniumpentadecafluorooktanoat CAS No. 3825-26-1	880 13kg in 2003 (129kg in 2002)	<0.2% <0.5%	Surface antistick. Thin layer leather	Industrial Industrial
Sweden[98]	No/yes	*	CAS No. 3825-26-1	Import*	*	*	Industrial
Switzerland[99]	Yes/Yes						
UK	Yes[100]	n/a	n/a	n/a	n/a	n/a	n/a

[98] "*" data could not be disclosed due to secrecy reasons: ≤ 3 companies have reported the marketing of the product containing the substance.

[99] Based on survey of Swiss Product Register, which includes both PFOA and PFOA-related substances, and products/mixtures containing PFOA or PFOA-related substances. The data bank can not prove that registered substances or products are still in use. . For historical reasons, also generic terms instead of univocal substance names with CAS numbers were partially used. Due to this feature of the data bank it also can not be guaranteed that all substances in use are detected in the search See Question 8 and notes to Table 5 for Switzerland..

[100] Detailed information is not available.

Question 9 (continued)

	Manufacture/ Import	Product/ mixture name	PFOA Chemical Name/ CAS No.	Manufacture/ Import Volume range of Chemical (kg) for 2003 calendar year	Conc. of Substance in Product/ mixture	Known Uses of the Product/mixture	Specify if Industrial and/or Consumer use, if possible
US	Yes/Yes[101]	Fluoropolymer aqueous dispersions	Octanoic acid, pentadecafluoro-, ammonium salt (also Ammonium perfluorooctanoate, or APFO) CAS No. 3825-26-1	n/a	< 1% by weight (Data source: AR226-1063)	Metal coating, fiberglass cloth and coating formulations.	Industrial use in manufacturing both industrial and consumer end products (i.e., non-stick cookware, construction fabrics, etc.)

[101] Certain fluorinated telomer chemical-containing products/mixtures manufactured in and imported into the U.S. may be PFOA-related substances. Limited data indicate that the 8-2 telomer alcohol metabolises and degrades to PFOA. Additional research is underway to determine whether other telomer chemicals can degrade similarly to PFOA. Specific telomer chemical identities and the production and importation volumes associated with those chemical identities are claimed as confidential business information (CBI) in the U.S. and cannot be reported here.

Annex

Table A1. Estimate for "Actual" Use and Application Fields of PFOS after the Retreat of 3M Products in Switzerland According to (RPA & BRE, 2000)[102]

Actual use	Kg/year	Share (%)
Photographic industry	19	8
Photolithography & semiconductors	9	4
Hydraulic fluids	14	6
Metal coating	190	82
Total use	**230**	
Storage of fire fighting foams	**2 300**	

[102] Up to know there are no studies about substance flows or actual measurements of concentrations in products available for Switzerland. The investigations carried out so far for Switzerland do not allow to answer the questions regarding use figures as detailed as inquired in Table 1 to 4 of this questionnaire. Consequently the estimates for Switzerland are based on data out of an international literature review. Literature that was used to estimate application fields and use figures for Switzerland is as following:

- RPA& BRE (2004), Perfluorooctane sulphonate risk reduction strategy and analysis of advantages and drawbacks, final report prepared by Risk & policy analysis limited and BRE Environment for Department for Environment, Food and rural affairs and the environment agency for England and Wales, August 2004.
- Hekster F. M., Voogt, P. de, Pijnenburg, A.M.C.M., Laane, R.W.P.M. (2002), Perfluoroalkylated substances – Aquatic environmental assessment, Report RIZK/ 2002.043, 1 July 2002.
- Havelund, S. (2001), Kortlægning af perfluorooktanylsulfonat og lignende forbindelser i forbrugerprodukter - fase 2, Miloproject No. 691, 2002, Miljostyrelsen, Miljoministeriet.

The results are presented in the Table A1. There are indications that PFOS/PFAS are still in use also in applications not pointed out as application fields after 3 M retreat by RPA&BRE (2004).

Table A2. EU Uses Found for PFOS and PFOS-Related Substances.

Industrial category
Chemical industry: used in synthesis
Metal extraction, refining and processing of metals
Paints, lacquers and varnishes industry
Paper, pulp and board industry
Polymers industry
Textile processing industry
Other
Type
Non dispersive use
Used in closed system
Use resulting in inclusion into or onto matrix
Wide dispersive use
Use category
Fixing agents
Flame retardants and fire preventing agents
Foaming agents
Impregnation agents
Intermediates
Solvents
Other