



STOCKHOLM
CONVENTION

Outcomes of the 19th meeting of the POPs Review Committee and intersessional work

Webinar

6 November 2023

POPRC-19

- 9–13 Oct 2023, Rome, FAO Headquarters
- Online pre-meetings, 19 Sep 2023, 1-4 pm CEST
- Chair: Mr. Peter Dawson (New Zealand)
- 125 participants (27 members and 98 observers)
- Recommended the listing of:
 - Chlorinated paraffins with carbon chain lengths in the range C_{14-17} and chlorination levels at or exceeding 45 per cent chlorine by weight
 - Long-chain perfluorocarboxylic acids, their salts and related compounds
- Adopted the risk profile for chlorpyrifos
- www.pops.int/poprc19



Candidate POPs

Chlorinated paraffins with carbon chain lengths in the range C_{14-17} and chlorination levels at or exceeding 45 per cent chlorine by weight

CAS No. 85535-85-9

Full Name: Alkanes, C_{14-17} , chloro

Synonyms: Medium-chain chlorinated paraffins (MCCPs); Chlorinated paraffins, C_{14-17} (used in Annex VI of the CLP Regulation)

Uses:

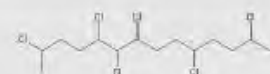
Chlorinated paraffins (CPs) with carbon chain lengths in the range C_{14-17} and a chlorination level at or exceeding 45% chlorine by weight, are the principal constituents of substances called medium-chain chlorinated paraffins (MCCPs) in Europe, North America and Australia, and major constituents of several products manufactured in Asia. MCCPs have a number of use such as a secondary plasticizer in polyvinyl chloride (PVC), adhesives, sealants, paints and coatings; a flame retardant in PVC and rubber compounds, adhesives, sealants, paints and coatings, and textiles; an extreme pressure lubricant and anti-adhesive for metal working fluids; a waterproofing agent for paints, coatings and textiles; and a carrier solvent for colour formers in paper manufacture.

Reference:

1. Proposal to list chlorinated paraffins with carbon chain lengths in the range C_{14-17} and chlorination levels at or exceeding 45 per cent chlorine by weight in Annexes A, B and/or C to the Stockholm Convention on Persistent Organic Pollutants. UNEP/POPS/POPRC.17/6.
2. Additional information relating to the proposal to list chlorinated paraffins with carbon chain lengths in the range C_{14-17} and chlorination levels at or exceeding 45 per cent chlorine by weight in Annexes A, B and/or C to the Stockholm Convention on Persistent Organic Pollutants. UNEP/POPS/POPRC.17/INF/3.

Hazards and Risks to human health and the environment

CPs with carbon chain lengths in the range C_{14-17} and a chlorination level at or exceeding 45% chlorine by weight, are considered to be persistent and may be long-range transported. The capacity to bioaccumulate has been assessed for CPs with 14 carbon atoms and suggested for CPs with carbon chain length in the range C_{15-17} . CPs are released to water, air, soil and sewage sludge. Constituents of CPs with C_{14-17} chain lengths are very toxic to aquatic invertebrates in the environment. Finally, adverse effects observed in rodents offspring such as internal hemorrhaging and death, suggest that CPs may cause potential adverse effects in mammalian wildlife.



$C_{14}H_{14}Cl_{15}$



$C_{17}H_{29}Cl_{17}$

Chlorinated paraffins with carbon chain lengths in the range C_{14-17} and chlorination levels at or exceeding 45 per cent chlorine by weight

- POPRC-17: Considered the proposal by UK
- POPRC-18: Considered the draft risk profile
 - Adopted the risk profile for chlorinated paraffins
- POPRC-19: Considered the draft risk management evaluation
 - Adopted the risk management evaluation (UNEP/POPS/POPRC.19/9/Add.1).
 - Recommend to the Conference of the Parties that it consider listing **chlorinated paraffins with carbon chain lengths in the range C_{14-17} and chlorination levels at or exceeding 45 per cent chlorine by weight**, subject to further specifying the chemical identity, in Annex A to the Convention with specific exemptions for several applications.
 - Noted that there has been no consensus on the chemical identity.
 - Established an **intersessional working group** to assess the information provided by Parties and observers, with the intention of **specifying the chemical identity and further strengthening the recommendation** on the listing for consideration by the Committee at POPRC-20.

Recommendations on the specific exemptions for chlorinated paraffins with carbon chain lengths in the range C_{14–17} and chlorination levels at or exceeding 45 per cent chlorine by weight:

- a) For **five years** from the date of entry into force of the amendment in accordance with Article 4:
 - i. Polyvinyl chloride (PVC), limited to the following uses:
 - In wires and cables in the construction sector
 - In calendered films in the packaging field
 - In rubber and plastic insulation materials
 - ii. Adhesives and sealants, limited to the following uses:
 - In building and construction
 - In waterproof coatings and anticorrosion coatings
 - In outdoor rubber running tracks
 - In aerospace and defence applications (e.g., polyurethane adhesives and tamperproof putty)
 - iii. Tape used for non-structural bonding in aerospace and defence products
- b) **For metal working fluids (MWFs), until 2036**, limited to use as extreme temperature and pressure additives for MWF used in 'heavy duty' processes for the production and repair of metals and metal alloy components such as those used in the following applications:
 - i. Aerospace and defence
 - ii. Automobiles;
 - iii. Electrical and electronic equipment (EEE) used for 'social infrastructure'
 - iv. Production of machinery and tools used in agriculture and building/construction
 - v. Energy and power generation
 - vi. Oil and gas extraction
 - vii. Chemical production and refining;
 - viii. Nuclear power facilities;
 - ix. Use in low-carbon and renewable energy technologies
 - x. Non-EEE medical devices

Recommendations on the specific exemptions for chlorinated paraffins with carbon chain lengths in the range C_{14–17} and chlorination levels at or exceeding 45 per cent chlorine by weight:

- c) **For use of polymers and rubbers used in replacement parts**, limited to the use in the following applications (where it was originally used in the manufacture of those articles), **until end of service life of the articles or 2041**, whichever comes earlier;
 - i. In the production of automobile parts
 - ii. In EEE used for ‘social infrastructure’
 - iii. In aerospace and defence products

Invitation for further information:

The Committee invited Parties and observers to provide, by **18 January 2024**, the following information that would assist in the possible strengthening of the recommendations by the Committee:

- a) **Information to enable the specification of the chemical identity**
- b) **Information to enable the determination of the concentration limit**
- c) **Any other information, including information on the applications relating to the specific exemptions**

Other recommendations on chlorinated paraffins with carbon chain lengths in the range C_{14–17} and chlorination levels at or exceeding 45 per cent chlorine by weight:

- a) COP to specify that, for the purpose of the Convention, the listed substances **should refer to the following congeners present in commercial CP products:**

$\text{C}_{14}\text{H}_{(30-x)}\text{Cl}_x$ where $x \geq 5$

$\text{C}_{15}\text{H}_{(32-x)}\text{Cl}_x$ where $x \geq 5$

$\text{C}_{16}\text{H}_{(34-x)}\text{Cl}_x$ where $x \geq 6$

$\text{C}_{17}\text{H}_{(36-x)}\text{Cl}_x$ where $x \geq 6$ ”

or

$\text{C}_{14}\text{H}_{(30-x)}\text{Cl}_x$ where $x \geq 4$

$\text{C}_{15}\text{H}_{(32-x)}\text{Cl}_x$ where $x \geq 4$

$\text{C}_{16}\text{H}_{(34-x)}\text{Cl}_x$ where $x \geq 5$

$\text{C}_{17}\text{H}_{(36-x)}\text{Cl}_x$ where $x \geq 5$ ”.

- b) Parties to take necessary measures to ensure that relevant products and articles containing the substances recommended for listing **can be easily identified**, for example by labelling or other means such as safety datasheets or databases, throughout its life cycle.

- c) When implementing control measures for the substances recommended for listing, each Party to consider the **available analytical techniques and enforcement technologies** available to them before determining whether effective control of the substances recommended for listing would require **control of all chlorinated paraffins with carbon chain lengths in the range C_{14–17} regardless of chlorination levels.**

- d) COP to specify appropriate **concentration limits**, above which, presence of a summed concentration of the congeners listed in paragraph 2 above, **note (i) of part I of Annex A** does not apply.

Long-chain perfluorocarboxylic acids, their salts and related compounds

- POPRC-17: Considered the proposal by Canada
- POPRC-18: Considered the draft risk profile
 - Adopted the risk profile for long-chain PFCAs
- POPRC-19: Considered the draft risk management evaluation
 - Adopted the risk management evaluation (UNEP/POPS/POPRC.19/9/Add.2).
 - Recommend to the COP that it consider listing long-chain perfluorocarboxylic acids, their salts and related compounds in Annex A with specific exemptions for several applications.
 - Established an intersessional working group to assess the information provided by Parties and observers with the intention of strengthening the recommendation on the listing of the chemicals for consideration at POPRC-20.

Candidate POPs

Long-chain perfluorocarboxylic acids (PFCAs), their salts and related compounds

CAS No. 375-95-1; 335-76-2; 2058-94-8; 307-55-1; 376-06-7; 72629-94-8; 141074-63-7; 67905-19-5; 57475-95-3; 16517-11-6; 133921-38-7; 68310-12-3

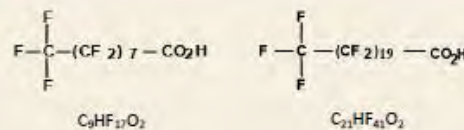
Chemical identity: Long-chain PFCAs with carbon chain lengths from 9 to 21 and their salts, are a homologous series of substances with the molecular formula of $C_nF_{2n+1}CO_2H$ (where $8 \leq n \leq 20$). "Perfluorinated" refers to fluorochemicals in which the hydrogen atoms directly attached to the carbon atoms are all replaced with fluorine atoms. Related compounds are any substances that is a precursor and may degrade or transform to long-chain PFCAs, where the perfluorinated alkyl moiety has the formula C_nF_{2n+1} (where $8 \leq n \leq 20$) and is directly bonded to any chemical moiety other than a fluorine, chlorine or bromine atom.

Uses:

PFCAs are members of the per- and polyfluoroalkyl substances (PFAS) chemical class. PFCAs with carbon chain lengths from 9 to 21 and their salts are infrequently used in products. Nonetheless, the ammonium salt of C_9 PFCA was identified as being used for surfactant applications and in the production of fluoropolymers. Substances that are related compounds to long-chain PFCAs have, however, been used in a range of applications, including in coating products, fabric/carpet protectors, textile impregnation agents and fire fighting foams. C_{9-14} PFCAs, their salts and related compounds may also be unintentionally produced during the manufacturing of PFAS, including those containing a carbon chain of less than nine carbon atoms, and in other industrial processes.

Hazards and Risks to human health and the environment

Long-chain PFCAs are characterized by their persistence in the environment and their bioaccumulation. Moreover, long-chain PFCAs, their salts and related compounds have the capacity to be long-range transported. Long-chain PFCAs have been detected in surface and ground water, as well as in food grown with contaminated soil or water. Health issues such as hepatotoxicity, developmental/reproductive toxicity, immunotoxicity, thyroid toxicity and others (e.g. cardiovascular, metabolic, renal toxicity) have been linked to human exposure to PFCAs. Effects in wildlife include developmental effects, behavioural effects, hepatotoxicity, immunotoxicity, neurotoxicity, chemosensitivity, altered gene expression and altered thyroid function.



Reference

1. Proposal to list long-chain perfluorocarboxylic acids, their salts and related compounds in Annexes A, B and/or C to the Stockholm Convention on Persistent Organic Pollutants. UNEP/POPS/POPRC.17/7.

Recommendations on the specific exemptions for long-chain PFCAs, their salts and related compounds

- a) For **five years** from the date of entry into force of the amendment in accordance with Article 4:
 - i. Cooling applications for the manufacture of high-heat and high-voltage parts for semiconductor manufacturing equipment
 - ii. Inactive/inert fluorine liquid for reliability testing and temperature control for the manufacture of electric components and electrical and electronic equipment
 - iii. Heat media in a closed system, including heat media in components of in vitro diagnostic medical devices, refractive media in analytical instruments for detecting fluorescence, and heat media in thermostatic chambers for reliability and durability testing of electric and electronic equipment
 - iv. Textiles for oil and water repellency for the protection of workers from dangerous liquids that comprise risks to their health and safety
 - v. Semiconductors designed for replacement parts not covered under paragraphs 2 (b) (i) and (ii).
- b) **Until the end of service life of the following articles or in 2041**, whichever comes earlier
 - i. Semiconductors designed for replacement parts for combustion engine powered vessels
 - ii. Replacement parts for motor vehicles that have ceased mass production
 - iii. Replacement parts containing heat media in a closed system, including heat media in components of in vitro diagnostic medical devices, refractive media in analytical instruments for detecting fluorescence, and heat media in thermostatic chambers for reliability and durability testing of electric and electronic equipment.

Invitation for further information:

The Committee invited Parties and observers to provide, by **18 January 2024**, the following information that would assist in the possible defining by the Committee of specific exemptions:

- a) Cooling applications for the manufacture of high-heat and high-voltage parts for semiconductor manufacturing equipment:
 - **Information on, and characterization of, chemical identity**
- b) Inactive/inert fluorine liquid for reliability testing and temperature control for the manufacture of electric components and electrical and electronic equipment:
 - **Information on the chemical identity of CAS No. 86508-42-1**, including information on whether there is a presence of long-chain PFCAs, their salts and related compounds, and, if so, **the length of the fluorinated carbon chain, and the concentration**
- c) Heat media in a closed system, including heat media in components of in vitro diagnostic medical devices, refractive media in analytical instruments for detecting fluorescence, heat media in thermostatic chambers for reliability and durability testing of EEE:
 - **Information on the chemical identity of CAS No. 86508-42-1**, including information on whether there is a presence of long-chain PFCAs, their salts and related compounds, and, if so, **the length of the fluorinated carbon chain, and the concentration;**
- d) Textiles for oil and water repellency for the protection of workers from dangerous liquids that comprise risks to their health and safety:
 - **Information on the concentration of long-chain PFCAs, their salts and related compounds present in short-chain PFAS used for this purpose**



Candidate POPs

Chlorpyrifos

CAS No. 2921-88-2

Full Name: *O,O*-diethyl *O*-(3,5,6-trichloro-2-pyridyl) phosphorothioate

Trade Names: Dursban, OMS 0971, Lorsban, Brodan, Killmaster, Pyrinex, Suscon, Coroban, Terial, Danusban, Durmet, Eradex

Synonyms: chlorpyrifos; chlorpyrifos-ethyl; chlorpyrifos-ethyl; *O,O*-diethyl *O*-(3,5,6-trichloro-2-pyridyl) phosphorothioate; phosphorothioic acid, *O,O*-diethyl *O*-(3,5,6-trichloro-2-pyridinyl) ester

Uses:

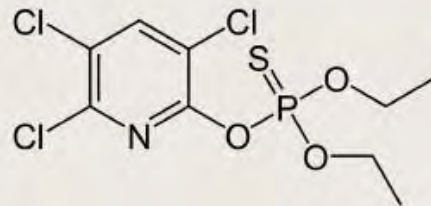
Chlorpyrifos is a broad-spectrum chlorinated organo-phosphate insecticide widely used in agriculture and as a biocide for non-agricultural pests. It has been used on various crops (corn, soybeans, alfalfa, oranges, wheat, and walnuts) as well as on lawns and ornamental plants. There are also public health uses, including adulticidal fogger treatments for mosquitoes, and the control of fire ants and certain species of ticks that may transmit diseases.

Reference

1. Proposal to list chlorpyrifos in Annex A to the Stockholm Convention on Persistent Organic Pollutants. UNEP/POPS/POPRC.17/3.
2. Additional information relating to the proposal to list chlorpyrifos in Annex A to the Stockholm Convention on Persistent Organic Pollutants. UNEP/POPS/POPRC.17/INF/4.

Hazards and Risks to human health and the environment

Chlorpyrifos is characterized by properties such as persistence in some environments, bioaccumulation and capacity to be long-range transported. It is released to the air, water and soil. Major health issues such as neurodevelopmental toxicity and neurotoxicity have been linked to chlorpyrifos exposure in humans. Uncertainty remains regarding its genotoxic potential. Chlorpyrifos is highly toxic to aquatic communities, early life stages of fish and aquatic invertebrates, bees, birds and mammals. Moreover, it exhibits effects at very low and environmentally relevant concentrations.



Chlorpyrifos

- **POPRC-17: Considered the proposal by EU**
 - Satisfied that the screening criteria in Annex D has met
- **POPRC-18: Considered the draft risk profile**
 - Deferred the decision on draft risk profile to POPRC-19
- **POPRC-19: Considered the draft risk profile**
 - Adopted the risk profile for chlorpyrifos (UNEP/POPS/POPRC.19/9/Add.3).
 - Decided that chlorpyrifos is likely, as a result of its long-range environmental transport, to lead to significant adverse human health and environmental effects such that global action is warranted.
 - Established an intersessional working group to prepare a risk management evaluation that includes an analysis of possible control measures for chlorpyrifos.
 - Invited Parties and observers to submit **Annex F information by 1 December 2023**.

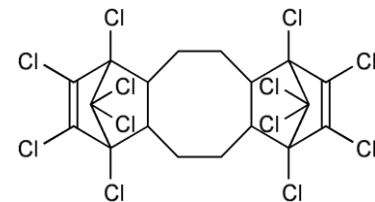
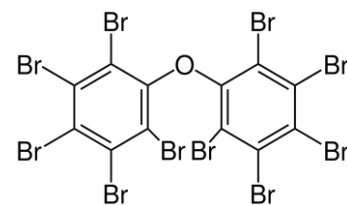
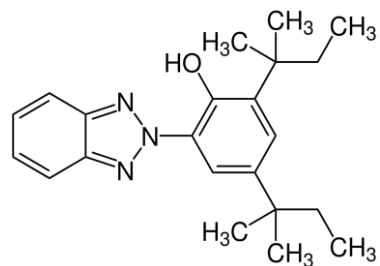


POPs in stockpiles, products and articles in use and in wastes

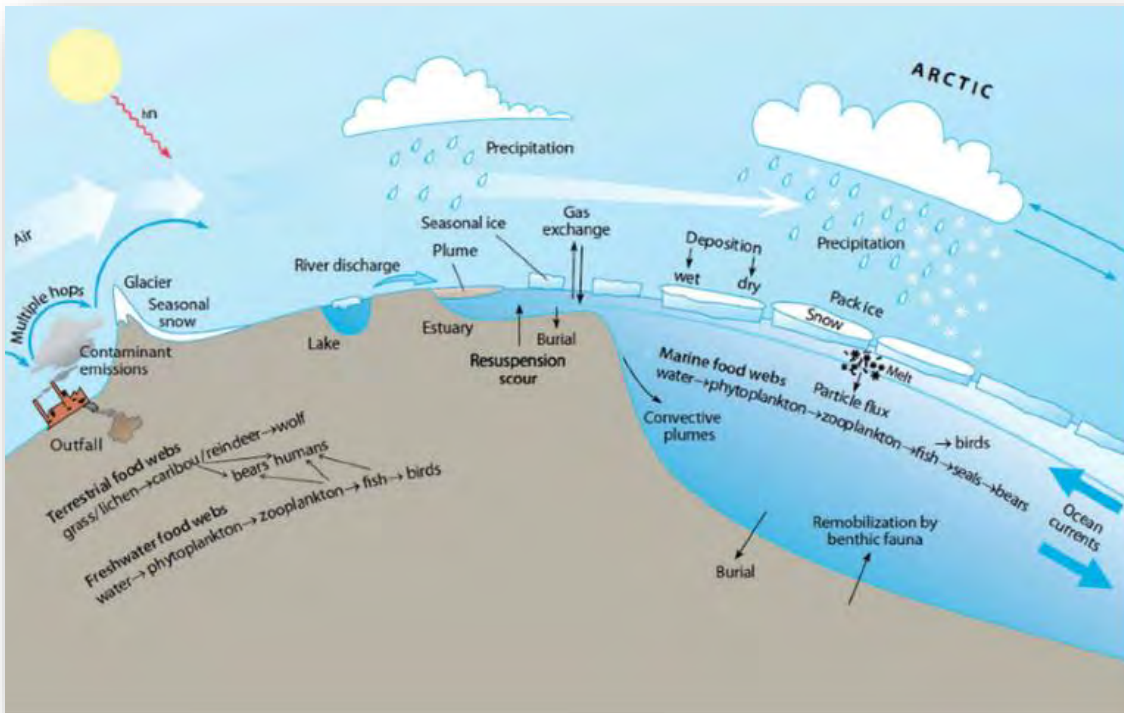
- **Decision SC-11/12:**
 - Requested the POPRC to consider options for identifying POPs in stockpiles, products and articles in use and in wastes and issues related to the production, import and export of products and articles containing POPs.
- Established an intersessional working group to undertake the activities requested in decision SC-11/12.
- Invited Parties and observers to provide, by **15 March 2024**, information on experiences with and challenges encountered in developing and implementing appropriate strategies for identifying POPs in stockpiles, products and articles in use and in wastes and other relevant information, using the form to be available.

Article 6, paragraph 1:

- (a) Develop appropriate strategies for identifying:
 - (i) Stockpiles consisting of or containing chemicals listed in Annex A or B;
 - (ii) Products and articles in use and wastes consisting of, containing or contaminated with a chemical listed in Annex A, B or C;
- (b) Identify, to the extent practicable, stockpiles consisting of or containing chemicals listed in Annex A or B on the basis of the strategies.



Long-range environmental transport



Kallenborn, R., et al. 2012. "The influence of climate change on the global distribution and fate processes of anthropogenic persistent organic pollutants". J. Environ. Monit., 2012, 14, 2854.

- POPRC-16: Established an intersessional work on LRET
- POPRC-17: Considered the draft on LRET
- POPRC-18: Considered the revised draft on LRET
- POPRC-19: Considered the further revised draft on LRET
 - Acknowledging the document on long-range environmental transport (UNEP/POPS/POPRC.19/INF/14/Rev.1), which is intended as a living document and accordingly may be periodically updated as necessary to continue to reflect the work, considerations and practices of the Committee.
 - Recommends that the Committee take into account the information in the document on long range environmental transport in its future evaluations of proposals for listing chemicals in the context of Article 8.

Indicative lists of substances covered by the listing of PFOA and by the listing of PFHxS

• Decisions SC-9/13, SC-10/14, SC-11/8

- Requested the Secretariat to compile, in consultation with the POPRC, the information submitted by Parties and others to establish indicative lists of substances covered by the listing of PFOA as well as by PFHxS, make it available on the Convention website, and update it periodically

- Revised draft indicative list of substances covered by the listing of PFOA (UNEP/POPS/POPRC.19/INF/16/Rev.1)
- Revised draft indicative list of substances covered by the listing of PFHxS (UNEP/POPS/POPRC.19/INF/17/Rev.2)



POPs Chemicals
Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds

CAS No. 335-47-1
HS Code: 29159090
Full Name: Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds

Synonyms:
Perfluorooctanoic acid (PFOA), including any of its branched isomers, its salts, PFOA-related compounds which, for the purposes of the Convention, are any substances that degrade to PFOA, including any substances (including salts and polymers) having a linear or branched perfluorooctyl group with the moiety (C₈F₁₇)C as one of the structural elements;

Uses:
PFOA, its salts and PFOA-related compounds are used widely in the production of fluorolastomers and fluoropolymers, for the production of non-stick kitchen ware, food processing equipment. PFOA-related compounds, including side-chain fluorinated polymers, are used as surfactants and surface treatment agents in textiles, paper and paints. Firefighting foams. PFOA has been detected in industrial waste, clean-resistant carpets, carpet cleaning liquids, house dust, microwave popcorn bags, water, food, and Teflon. Unintentional formation of PFOA is created from inadequate incineration of fluoropolymers from municipal solid waste incineration with inappropriate incineration or open burning facilities at moderate temperatures.

Hazards and Risks to human health and the environment:
PFOA is identified as a substance of very high concern with a persistent, bioaccumulative and toxic structure for the environment and being persistent. PFOA-related compounds are released into the air, water, soil and solid waste, and degrade to PFOA in the environment and in organisms. Major health issues such as kidney cancer, testicular cancer, thyroid disease, pregnancy-induced hypertension, high cholesterol have been linked to PFOA.

Reference

1. Risk management evaluation on perfluorooctanoic acid (PFOA), perfluorooctanoic acid, its salts and PFOA-related compounds. Technical report for the Stockholm Convention, 2017. UNEP POPRC.19/INF/16/Rev.1
2. Chemical safety assessment of perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds. Technical report for the Stockholm Convention, 2017. UNEP POPRC.19/INF/17/Rev.2
3. Chemical safety assessment of perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds. Technical report for the Stockholm Convention, 2017. UNEP POPRC.19/INF/17/Rev.2
4. Chemical safety assessment of perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds. Technical report for the Stockholm Convention, 2017. UNEP POPRC.19/INF/17/Rev.2
5. Chemical safety assessment of perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds. Technical report for the Stockholm Convention, 2017. UNEP POPRC.19/INF/17/Rev.2

Stockholm Convention: PFOA, its salts and PFOA-related compounds are listed in Annex A to the Stockholm Convention without any specific exemptions (Decision SC-10/13).

Secretariat of the Basel, Rotterdam and Stockholm Conventions
11-12, Chemin des Bains
1219 Châtelaine, Switzerland
Tel: +41 22 917 8271
Email: pop@unep.org
Website: www.unep.org

UN environment programme



POPs Chemicals
Perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds

CAS No. 355-46-4
HS Code: 38220090
Full Name: Perfluorohexane-1-sulfonic acid (PFHxS)

Trade Name: RM70 (CAS No. 432-50-7), RM75 (1871-99-0), and RM570 (CAS No. 41997-13-1) (PFHxS-related substances produced by Miteni SpA, Italy)

Synonyms: PFHxS; PFHxS
Tridecafluorohexane-1-sulfonic acid, Tridecafluorohexane-1-sulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-Tridecafluorohexane-1-sulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-Tridecafluoro-1-hexanesulfonic acid

Uses:
PFHxS, its salts and related substances have unique properties with a high resistance to friction, heat, chemical agents, low surface energy and used as water, grease, oil and soil repellent. It is widely utilized in a variety of consumer goods such as carpets, leather, apparel, textiles, firefighting foam, papermaking, printing inks, sealants, non-stick cookware.

Hazards and Risks to human health and the environment:
PFHxS are very resistant to chemical, thermal and biological degradation due to their strong carbon-fluorine bonds and a resistance to degradation which makes it persist in the environment. PFHxS concentrations are found in biota and human milk and its elimination takes approximately 8 years. Effects of PFHxS in humans are found to influence on the nervous system, brain development, endocrine system and thyroid hormone.

Reference

1. Risk profile on perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds. Technical report for the Stockholm Convention, 2017. UNEP POPRC.19/INF/16/Rev.1
2. Proposed list of perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds in Annex A, B and C to the Stockholm Convention on Persistent Organic Pollutants. UNEP/POPRC.19/INF.16/Rev.1
3. Chemical safety assessment of perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds. Technical report for the Stockholm Convention, 2017. UNEP POPRC.19/INF/17/Rev.2

Stockholm Convention: PFHxS, its salts and PFHxS-related compounds are listed in Annex A to the Stockholm Convention without any specific exemptions (Decision SC-10/13).

Secretariat of the Basel, Rotterdam and Stockholm Conventions
11-12, Chemin des Bains
1219 Châtelaine, Switzerland
Tel: +41 22 917 8271
Email: pop@unep.org
Website: www.unep.org

UN environment programme

Thank you



Secretariat of the Stockholm Convention
International Environment House I
11-15 Chemin des Anémones
CH-1219 Châtelaine, Geneva, Switzerland
www.brsmeas.org