

Workshop “From science to action, for the implementation of the BRS conventions and guidance on the environmentally sound management of industrial chemicals



Industrial chemicals proposed for listing under the Stockholm Convention

12 April 2023

Agustin Harte, Secretariat of the Basel, Rotterdam and Stockholm Conventions





POPs listed under the Stockholm Convention

Elimination

14 Pesticides:

Aldrin, Chlordane, Chlordecone, Dicofol, Dieldrin, Endosulfan, Endrin, Heptachlor, Alpha/beta/gamma HCH, Mirex, PCP, Toxaphene

13 Industrial POPs:

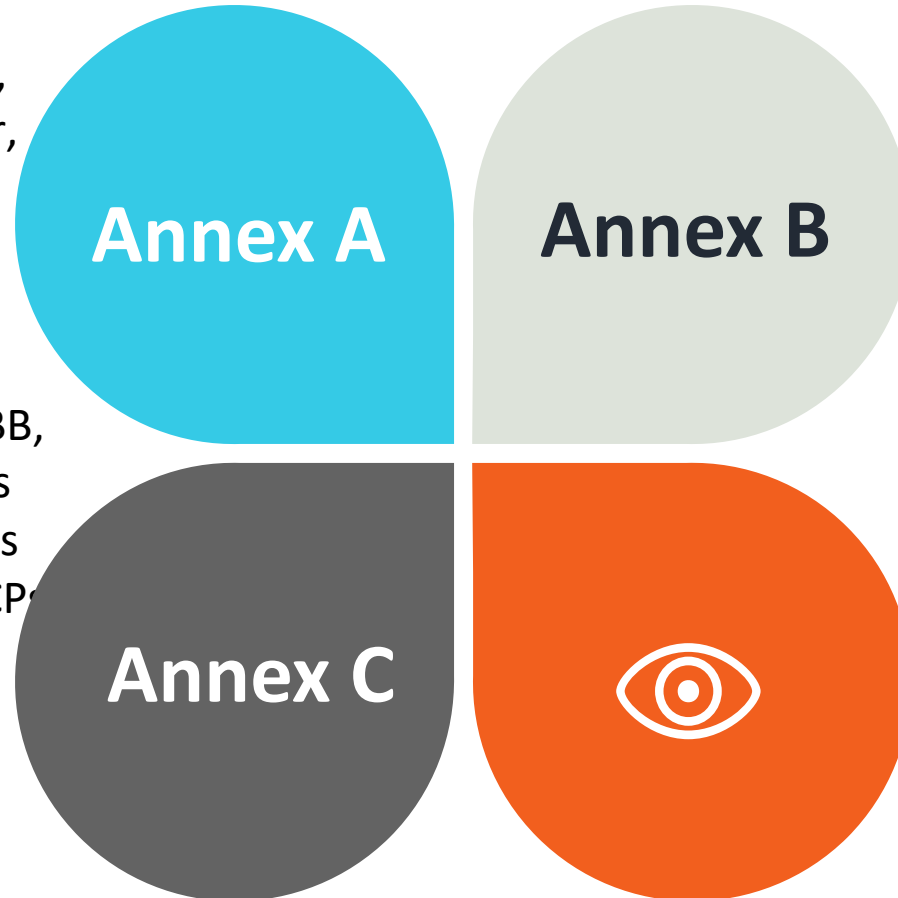
C-DecaBDE, C-OctaBDE, C-PentaBDE, HBB, HBCDD, HCB, PCB, PCN, PFHxS, its salts and PFHxS-related compounds, PFOA, its salts and PFOA-related compounds, SCCP, HCB*, PeCB*

**Also used as pesticides*

Unintentional releases

7 U-POPs:

HCB, HCB, PeCB, PCB, PCDD/PCDF, PCN



Restriction

1 Pesticide: DDT

1 Industrial POP: PFOS, its salts and PFOA

**Annex B chemicals have "Acceptable purposes" for which Parties can continue production/use if registered.*

Under review

Article 8, Annex D, E, F,
POPs Review Committee (POPRC)

Year 1: Proposal / Annex D screening
↓
Year 2: Annex E risk profile
↓
Year 3: Annex F risk management evaluation / recommendation
↓
Year 4: COP decision

Annex D screening criteria

Persistence

- Half-life of the chemical in water is >2 months, in soil is >6 months, in sediment is >6 months
- Chemical is otherwise sufficiently persistent to justify its consideration within the scope of the Convention

Bioaccumulation

- BCF or BAF in aquatic species for the chemical is >5,000, or logKow is >5
- A chemical presents other reasons for concern, such as high bio-accumulation in other species, high toxicity or ecotoxicity
- Monitoring data in biota indicating that the bio-accumulation potential of the chemical is sufficient to justify its consideration within the scope of the Convention



Potential for long-range environmental transport

- **Measured** levels of the chemical in locations distant from the sources of its release that are potential concern
- Monitoring data showing that LRTP of the chemical, with the **potential for transfer to a receiving environment**, may have occurred via air, water or migratory species
- Environmental fate properties and/or **model results** that demonstrate that the chemical has a LRTP through air, water or migratory species, with the **potential for transfer to a receiving environment** in locations distant from the sources of its release. For a chemical that migrates significantly through the air, its half-life in air should be >2 days.

Adverse effects

- Evidence of adverse effects to human health or to the environment that justifies consideration of the chemical within the scope of this Convention.
- Toxicity or ecotoxicity data that indicate the potential for damage to human health or to the environment

Annex E risk profile

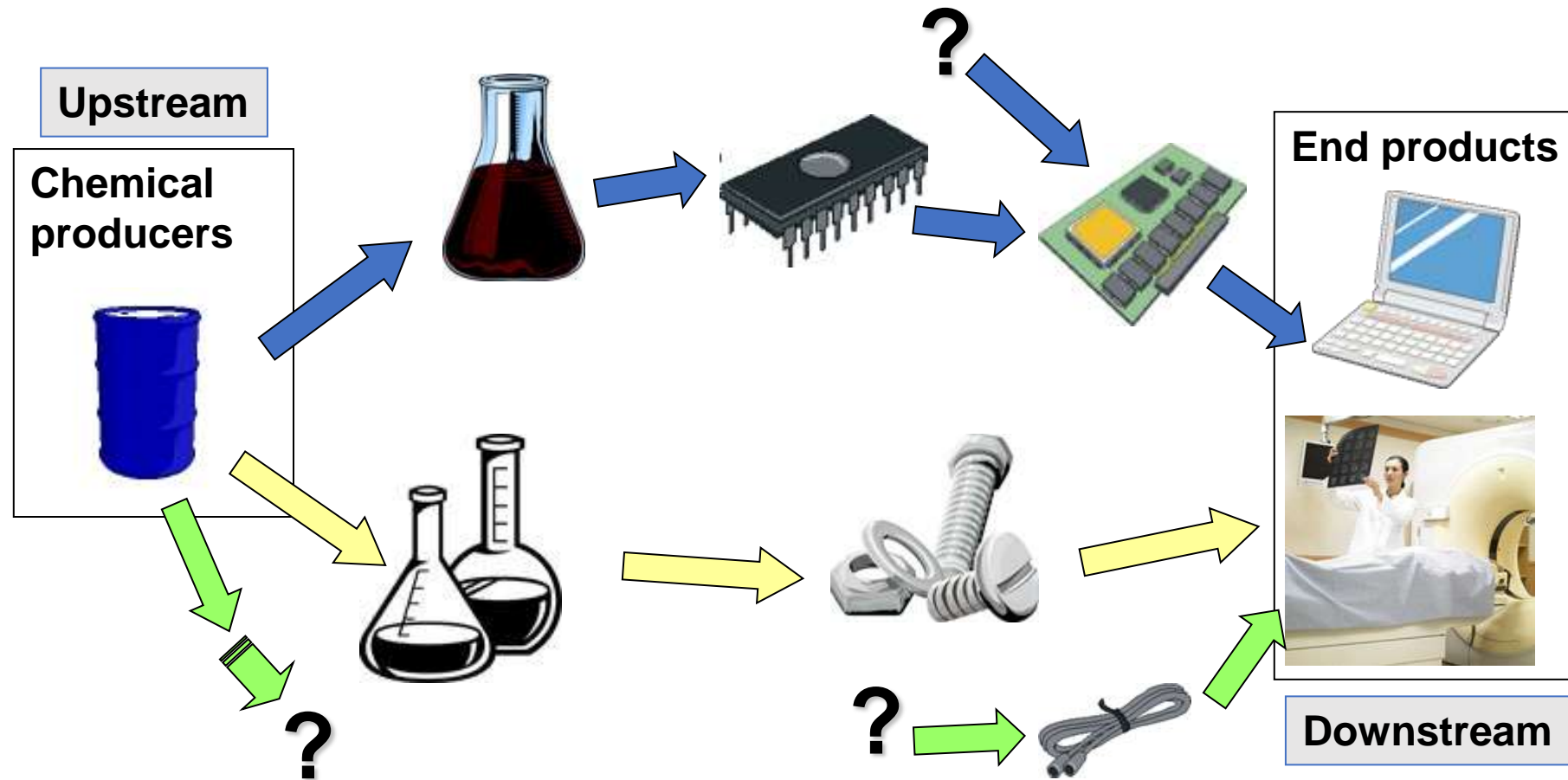


- a. Sources (Production, use, releases)
- b. Hazard assessment for the endpoint
- c. Environmental fate (**including properties linked to environmental transport**)
- d. Monitoring data
- e. **Exposure in local areas, in particular as a result of long-range environmental transport, including information regarding bio-availability**
- f. National and international risk evaluations, assessments or profiles and labelling information and hazard classifications
- g. Status of the chemical under international conventions

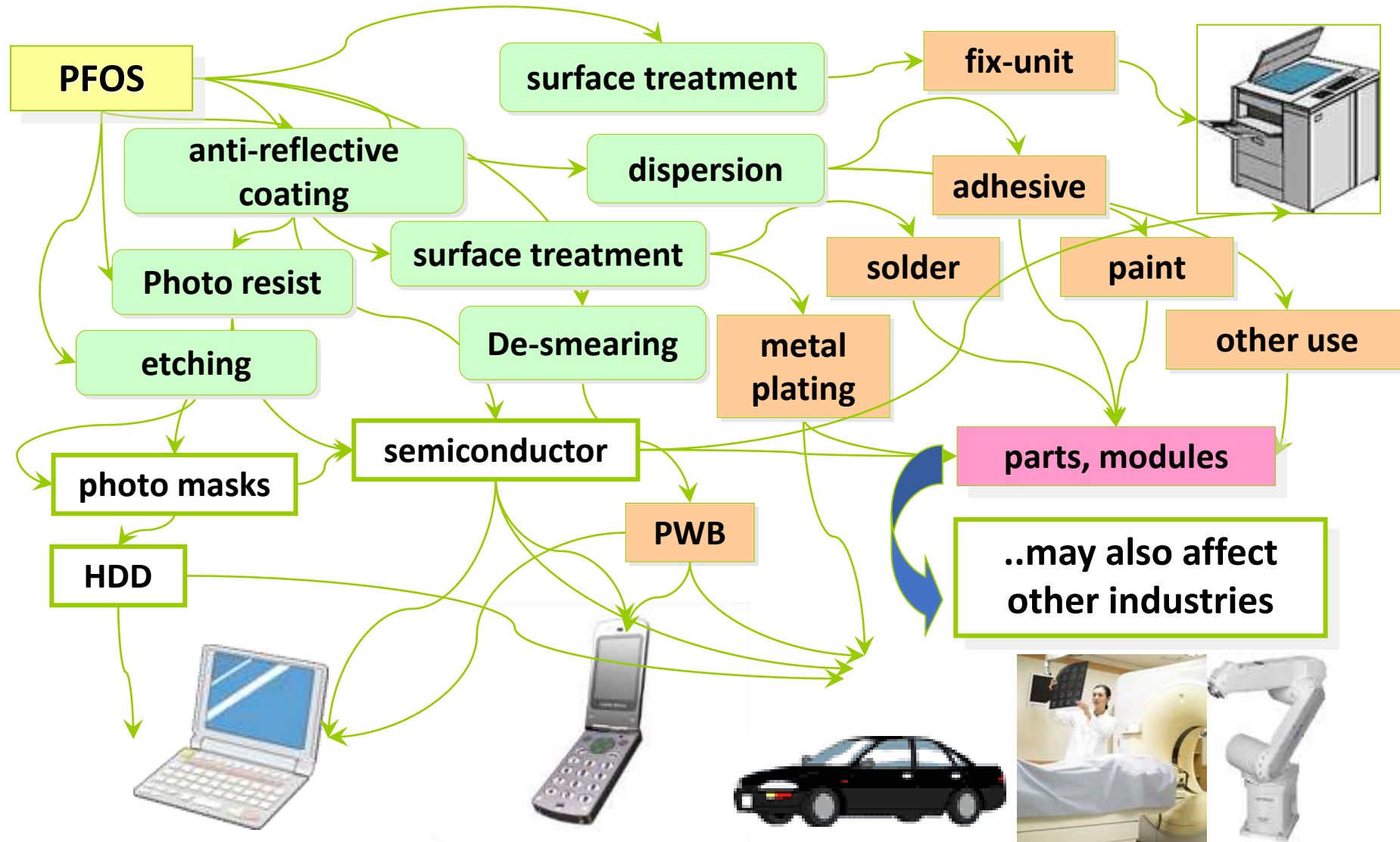
Annex F socio-economic information

- Efficacy and efficiency of possible control measures
- Alternatives (costs, risks, efficacy, accessibility)
- Positive/negative impacts of control measures on health, agriculture, biota, economic aspects, social costs
- Waste, disposal implications, stockpiles
- Access to information and public education
- Status of control and monitoring capacity
- Any national or regional control actions

Special care is needed for industrial chemicals because they are used in numerous processes and parts:



Special care is needed for industrial chemicals because they have complex supply-chain and involves many producers and users:



Methoxychlor

- POPRC-15: concluded that Methoxychlor meted Annex D criteria
- POPRC-16: Adopted the risk profile
- POPRC-18: Adopted the risk management evaluation And decided, in accordance with paragraph 9 of Article 8 of the Convention, to recommend to the Conference of the Parties that it consider listing methoxychlor in Annex A to the Convention without specific exemptions.

UNEP/POPS/COP.11/12

Proposed for listing under the Stockholm Convention Methoxychlor

CAS No. 72-43-5

Full Name: Methoxychlor

Trade Name: ; Dimethoxy-DDT; Dimethoxy-DT; DMDT;

Para,para'-DMDT; ENT1716; Hlgalmetox; Maralate; Marlatae;

OMS 466; Metox; Methoxy-DDT; Prentox

Synonyms: 1,1-Bis(para-methoxyphenyl)-2,2,2-trichloroethane; 2,2-Bis(para-methoxyphenyl)-1,1,1-trichloroethane;

2,2-Di-para-anisyl-1,1,1-trichloroethane para,para'-dimethoxydiphenyltrichloroethane;

1,1,1-Trichloro-2,2-bis(para-methoxyphenyl)ethane;

1,1,1-Trichloro-2,2-di(4-methoxyphenyl)ethane;

1,10-(2,2,2-Trichloroethylidene)bis(4-methoxy-benzene);

Di(para-methoxyphenyl)trichloromethyl methane

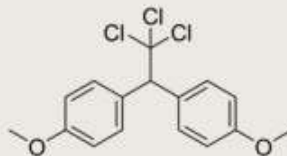
Uses:

Methoxychlor is an organochlorine pesticide originally developed as a replacement for DDT. Methoxychlor has been used as an insecticide combating a wide range of pests including biting flies, houseflies, mosquito larvae, cockroaches, and chiggers. It has commonly been used in both agricultural and veterinary practices, for example for treating field crops, vegetables, fruits, stored grains, livestock, pets, homes, gardens, lakes, and marshes.

Process for listing a new chemical under the Stockholm Convention

Article 8:

- 1) A Party submits a proposal
- 2) The POPs Review Committee examines the proposal against Annex D screening criteria
- 3) If fulfilled, the POPs Review Committee prepares a risk profile based on Annex E information from Parties and observers
- 4) If adopted, the POPs Review Committee prepares a risk management evaluation based on Annex F information from Parties and observers
- 5) If adopted, the POPs Review Committee makes a recommendation on listing



Reference

1. Proposal to list methoxychlor in Annex A to the Stockholm Convention on Persistent Organic Pollutants. Persistent Organic Pollutants Review Committee. 2010, UNEP/POPS/POPRC.15/4



Secretariat of the Basel, Rotterdam and Stockholm Conventions
11-13, Chemin des Anémones
1219 Châtelaine, Switzerland
Tel: +41 22 917 8271
Email: brs@brsmies.org
Website: www.pops.int



STOCKHOLM CONVENTION





Candidate POPs

UV-328

CAS No. 25973-55-1

Full Name: Phenol, 2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylpropyl)-

Trade Name: BLS 1328, Chiguard 328, Chisorb 328, Cyasorb UV 2337, Eversorb 74, GSTAB 328, Hostavin 3310 P, Kemisorb 74, Lowilite 28, Milestab 328, Seesorb 704, Songsorb 3280, Sumisorb 350, Thasorb UV328, Tin 328, Tinuvin 328, UV 2337, UV 74, Uvinul 3028, Viosorb 591

Synonyms: 2-(2H-Benzotriazol-2-yl)-4,6-di-tert-pentylphenol (BDTP), 2-(2'-Hydroxy-3',5'-di-tert-amyphenyl) benzotriazole

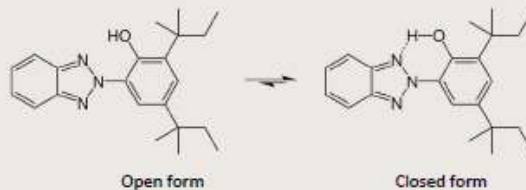
Uses:
UV-328 is a phenolic benzotriazole that is used as a UV absorber to protect surfaces against discoloration and degradation under UV/sunlight. UV-328 has wide range of applications, but its main uses are in paints and coatings, and as an additive in a wide variety of plastics, including in the non-food contact layer of food packaging. In the automobile sector, UV-328 is used in paints, coatings and sealants, as well as in liquid crystal panels and meters mounted on vehicles, and resin for interior and exterior parts of vehicles. In food packaging, it is used as an additive in plastics, printing ink and adhesives.

Reference

1. Risk profile for UV-328. UNEP/POPS/POPRC.17/13/Add.3.
2. Proposal to list UV-328 in Annex A to the Stockholm Convention on Persistent Organic Pollutants. Risk profile for UV-328. UNEP/POPS/POPRC.16/4.

Hazards and Risks to human health and the environment

UV-328 is characterized by its persistence and its capacity to bioaccumulate and to be long-range transported. Sources of UV-328 in the environment can include industrial facilities that produce or use the substance, wastewater treatment plants, stormwater, landfills and plastic litter/debris. UV-328 has been detected in various environment media, including ambient air, water, soil, sediment, biota and humans in many regions of the world. In mammals, the primary health effect of UV-328 is liver toxicity. UV-328 has also been associated with adverse effects on the kidneys in rats, and potential effects on the reproductive system have been suggested in studies on rats and dogs. UV-328 may also lead to anti-androgenic activity based on in vitro study. Finally, UV-328 has been found to be associated with adverse effects in fish.



UV-328

- POPRC-17: Adopted the risk profile
- POPRC-18: Adopted the risk management evaluation
 - Recommended listing UV-328 in Annex A with specific exemptions specific exemptions for production and use for the following: motor vehicles; mechanical separators in blood collection tubes; industrial coating applications for automotive coating, engineering machine coating, rail transit coating, and heavy-duty coating for large steel structures; TAC film in polarizers; photographic paper in accordance with Article 4; as well as for replacement parts for articles in the following applications until the end of the service life of the articles or 2044, whichever comes earlier:
 - (a) Motor vehicles;
 - (b) Stationary industrial machines for use in agriculture, forestry and construction;
 - (c) Liquid crystal displays in medical and in-vitro diagnostic devices;
 - (d) Liquid crystal displays in instruments for analysis, measurements, control, monitoring, testing, production and inspection.

UNEP/POPS/COP.11/14

Dechlorane Plus

- POPRC-17: Adopted the risk profile
- POPRC-18: Adopted the risk management evaluation
 - Recommended listing in Annex A with specific exemptions for production and use for the following: aerospace, space and defence applications, and medical imaging and radiotherapy devices/installations in accordance with Article 4, as well as replacement parts for, and repair of, articles in the following applications until the end of the service life of the articles or 2044, whichever comes earlier:

- (a) Aerospace;
- (b) Space;
- (c) Defence;
- (d) Motor vehicles;
- (e) Stationary industrial machines for use in agriculture, forestry and construction;
- (f) Marine, garden, forestry and outdoor power equipment;
- (g) Medical and in vitro diagnostic devices;
- (h) Medical imaging and radiotherapy devices/installations;
- (i) Instruments for analysis, measurements, control, monitoring, testing, production and inspection.

Candidate POPs

Dechlorane Plus and its syn-isomer and anti-isomer

CAS No. 13560-89-9; 135821-03-3; 135821-74-8

Full Name: 1,6,7,8,9,14,15,16,17,17,18,18-dodecachloropentacyclo-[12.2.1.16,9.02,13.05,10]octadeca-7,15-dien

Trade Name: Dechlorane Plus 25 (Dech Plus); Dechlorane Plus 35 (Dech Plus-2); DP-515; Dechlorane 605; Dechlorane A; DP; DDC-CO; Escapeflam DK-15

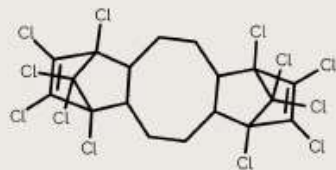
Synonyms: Bis(hexachlorocyclopentadieno)cyclooctane; 1,2,3,4,7,8,9,10,13,13,14,14-Dodecachloro-1,4,4a,5,6,6a,7,10,10a,11,12,12a-dodechydro-1,4,7,10-dimethanodibenzo[a,e]cyclooctene; Dodecachlorododecahydromethanodibenzocyclooctene

Uses:

As a flame retardant, Dechlorane Plus is used in many polymeric systems. Examples of thermoplastics that may contain Dechlorane Plus include nylon, polyester, acrylonitrile butadiene styrene (ABS), natural rubber, polybutylene terephthalate (PBT), polypropylene, and styrene butadiene rubber (SBR) block copolymer. Dechlorane Plus may be used in thermosets such as epoxy and polyester resins, polyurethane foam, polyethylene, ethylene propylene diene monomer rubber, polyurethane rubber, silicon rubber, and neoprene.

Process for listing a new chemical under the Stockholm Convention Article 8:

- 1) A Party submits a proposal
- 2) The POPs Review Committee examines the proposal against Annex D screening criteria
- 3) If fulfilled, the POPs Review Committee prepares a risk profile based on Annex E information from Parties and observers
- 4) If adopted, the POPs Review Committee prepares a risk management evaluation based on Annex F information from Parties and observers
- 5) If adopted, the POPs Review Committee makes a recommendation on listing
- 6) COP decides whether to list the new chemical



Reference

1. Proposal to list Dechlorane Plus (CAS No: 13560-89-9) and its syn-isomer (CAS No:135821-03-3) and anti-isomer (CAS No:135821-74-8) in Annexes A, B and/or C to the Stockholm Convention on Persistent Organic Pollutants. Persistent Organic Pollutants Review Committee. 2019:UNEP/POPs/POPRC.15/3

Chlorpyrifos

- POPRC-17: Considered the proposal by EU
 - Satisfied that the screening criteria in Annex D has met
 - Established an intersessional working group to develop a draft risk profile
 - Invited Parties and observers to submit Annex E information
- Draft risk profile for chlorpyrifos (UNEP/POPS/POPRC.18/4, 4/Add.1)
- Additional information relating to the draft RP (UNEP/POPS/POPRC.18/INF/8)
- **POPRC-19: Will consider Draft risk profile for chlorpyrifos**



Candidate POPs

Chlorpyrifos

CAS No. 2921-88-2

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

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

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

Uses:

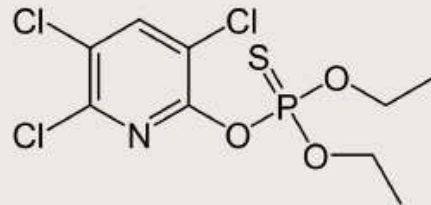
Chlorpyrifos is a broad-spectrum chlorinated organophosphate insecticide widely used in agriculture and as a biocide for non-agricultural pests. It has been used on various crops (corn, soybeans, alfalfa, oranges, wheat, and walnuts) as well as on lawns and ornamental plants. There are also public health 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.



Candidate POPs

Chlorinated paraffins with carbon chain lengths in the range C₁₄₋₁₇ and chlorination levels at or exceeding 45 per cent chlorine by weight

CAS No. 85535-85-9

Full Name: Alkanes, C₁₄₋₁₇, chloro

Synonyms: Medium-chain chlorinated paraffins (MCCPs); Chlorinated paraffins, C₁₄₋₁₇ (used in Annex VI of the CLP Regulation)

Uses:

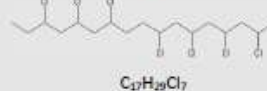
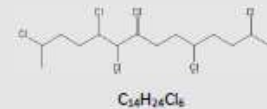
Chlorinated paraffins (CPs) with carbon chain lengths in the range C₁₄₋₁₇ and a chlorination level at or exceeding 45% chlorine by weight, are the principal constituents of substances called medium-chain chlorinated paraffins (MCCPs) in Europe, North America and Australia, and major constituents of several products manufactured in Asia. MCCPs have a number of uses 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 C₁₄₋₁₇ 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 C₁₄₋₁₇ 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 C₁₄₋₁₇ 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 C₁₅₋₁₇. CPs are released to water, air, soil and sewage sludge. Constituents of CPs with C₁₄₋₁₇ 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.



Chlorinated paraffins with carbon chain lengths in the range C₁₄₋₁₇ and chlorination levels at or exceeding 45 per cent chlorine by weight

- POPRC-17: Considered the proposal by UK
 - Satisfied that the screening criteria in Annex D has met
 - Established an intersessional working group to develop a draft risk profile
 - Invited Parties and observers to submit Annex E information
- Risk profile for chlorinated paraffins with carbon chain lengths in the range C₁₄₋₁₇ and chlorination levels at or exceeding 45 per cent chlorine by weight (UNEP/POPS/POPRC.18/11/Add.3)
- Additional information (UNEP/POPS/POPRC.18/INF/10)
- POPRC-19: will consider draft risk management evaluation

Long-chain perfluorocarboxylic acids, their salts and related compounds

- POPRC-17: Considered the proposal by Canada
 - Satisfied that the screening criteria in Annex D has met
 - Established an intersessional working group to develop a draft risk profile
 - Invited Parties and observers to submit Annex E information
- Draft risk profile for long-chain perfluorocarboxylic acids, their salts and related compounds (UNEP/POPS/POPRC.18/11/Add.4)
- Additional information (UNEP/POPS/POPRC.18/INF/12)
- Draft indicative list of long-chain perfluorocarboxylic acids, their salts and related compound (UNEP/POPS/POPRC.18/INF/14)
- Database of PFAS concentrations: www.pops.int/poprc18
- **POPRC-19: will consider draft risk management evaluation**

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

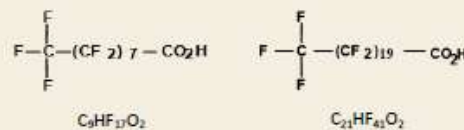
Chemical identity: Long-chain PFCAs with carbon chain lengths from 9 to 21 and their salts, are a homologous series of substances with the molecular formula of $C_nF_{2n+1}CO_2H$ (where $8 \leq n \leq 20$). "Perfluorinated" refers to fluorochemicals in which the hydrogen atoms directly attached to the 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 - C_{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

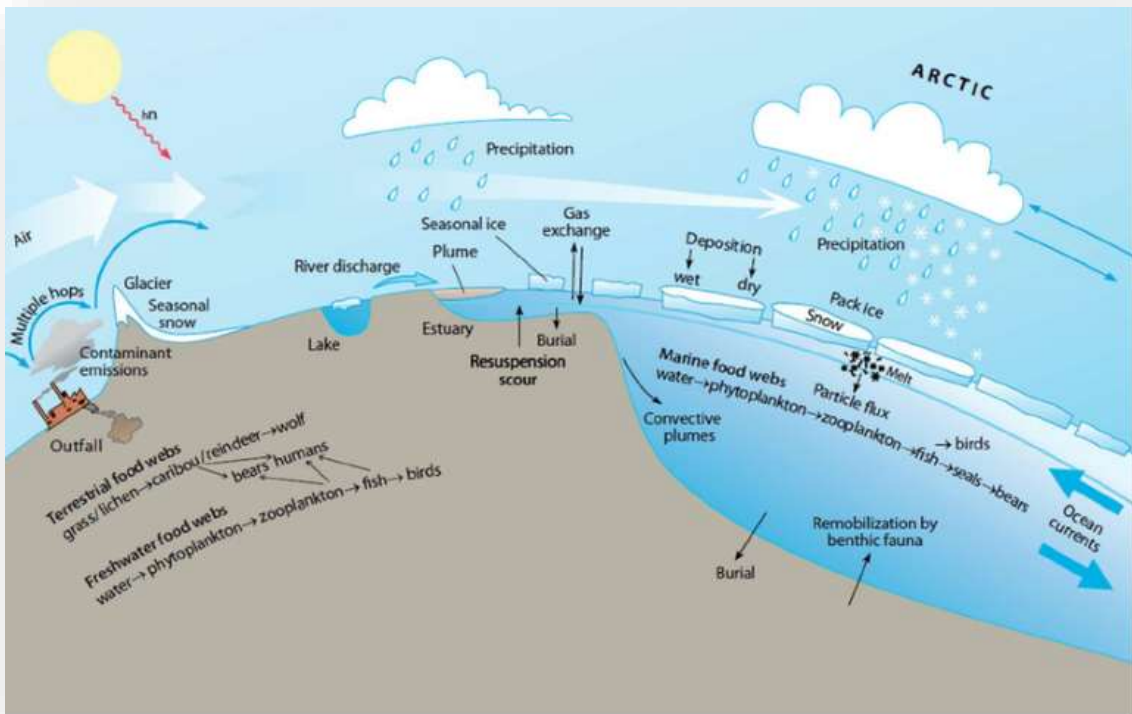
Long-chain PFCAs are characterized by their persistence in the environment and their bioaccumulation. Moreover, long-chain PFCAs, their salts and related compounds have the capacity to be long-range transported. Long-chain PFCAs have been detected in surface and ground water, as well as in food grown 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.

Long-range environmental transport



- POPRC-16: Established an intersessional work on LRET
- POPRC-17: Considered the draft on LRET
 - Requested the intersessional working group to further develop the draft document for Committee on its consideration of LRET
- Long-range environmental transport (UNEP/POPS/POPRC.18/9)
- Draft document on long-range environmental transport (UNEP/POPS/POPRC.18/INF/21)
- Comments and responses relating to the draft document (UNEP/POPS/POPRC.18/INF/22)
- **POPRC-19: will further consider the draft document**

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.

Workshop “From science to action, for the implementation of the BRS conventions and guidance on the environmentally sound management of industrial chemicals



Many thanks

Kei Ohno

Secretariat of the Basel, Rotterdam and Stockholm Conventions

Kei.ohno@un.org

