

Annex 2 - Restricted List, Rev.: 04-27/01/2025

Issuing Directorate: Health, Safety, Environment (HSE) and Operational Risk Directorate

Responsible Manager: Alessandra Freitas | **Registration:** 81050012 | **Area:** Process Security and Operational Risk

Target audience: Process and Risk Safety, Supplies, Logistics, HSE, Warehouse, Storage, Laboratory, Pilot Plant, Repair Facility, Plant, Operation, Geotechnics, Effluent treatment plant (ETP), Water Treatment Plant (WTP) and other areas carrying out activities involving the chemical product application cycle (registration, requisition, transport, storage, transfer, use and post-use).

Need for Training: (x) YES () NO

Restricted Substances

Item	Group	Chemical substance	CAS	Reference for use	Technical reference	Reason for Restriction
1	Nitrile/alkene	Acrylonitrile	107-13-1	Industrial application as an additive in dyes. It is used in the manufacture of resins such as acrylonitrile, butadiene styrene, plastics, acrylic fibres and nitrile rubber	Directive 1.907/2006/EU (REACH) - Annex XVII (restricted use)	Carcinogenic cat. 1A or 1B Regulation (EC) 1272/2008 (GHS)
2	Alkanes	Medium-chain chlorinated paraffins (MCCP) Short-chain chlorinated paraffin (SCCP)	85535-85-9 85535-84-8	Lubricating oil for cutting, plasticisers, plastics, paints, sealants and rubbers	Directive 1.907/2006/EU (REACH) - Annex XIV (use subject to authorisation)	Risk to human health and the environment. CAS 85535-84-8: possibly carcinogenic 2B PBT; CAS 85535-84-8: suspected PBT
3	Aliphatic Halogenated	Methyl bromide	74-83-9	Use permitted for quarantine and phytosanitary purposes only, with specific authorisation	DAS/ANVISA/IBA MA Normative Instruction No. 1 of 10/Sep/2002 and MAPA Normative Instruction No. 32 of 23/Sep/2015	Destroys the ozone layer and has a high environmental impact
4	Antibacterials	Triclosan	3380-34-5 533089-61-1	Application in the pharmaceutical industry to produce various medicines and personal care products	Resolution RDC ANVISA no. 29, 1/Jun/2012	Prolonged exposure can contribute to bacterial resistance and potentially interfere with the endocrine system
5	Azo-compounds (colourants)	Azo dyes	92-67-1, 92-87-5, 95-69-2, 91-59-8, 97-56-3, 99-55-8,	Industrial application to produce paints, dyes and pigments	Directive 1.907/2006/EU (REACH) - Annex	They can release carcinogenic aromatic

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			106-47-8, 615-05-4, 101-77-9 91- 94-1, 119-90- 4, 119-93-7, 838-88-0, 120-71-8, 101-14-4, 101-80-4, 139-65-1, 95- 53-4, 95-80-7, 137- 17-7, 90-04-0, 60-09-3		XVII (restricted use)	amines in textile and leather products that come into direct and prolonged contact with human skin.
6	Carbamates	Carbaryl	63-25-2	Pesticide, Aedes Aegypti control	ANVISA IN no. 103, 19/or/2021 and RDC no. 294, 29/jun/2019	Inhibits the enzyme acetylcholineste rase, essential for the functioning of the nervous system
7	Volatile organic compounds (VOCs) and solvents	Benzene, in percentages greater than 1%	71-43-2	Industrial solvent for paints, glues and varnishes Raw material for obtaining nylon and Styrofoam	NR-15, Ordinance No. 427, of 07/Oct/2021 and Directive 1.907/2006/EU (REACH) - Annex XVII (restricted use)	Health risk, recognised as a carcinogenic substance
		1,1 Dichloroethylene (vinyl chloride)	75-35-4	Industrial application in the production of resins, adhesives, soft drinks, synthetic fibres. Pharmaceutical industry in the production of cosmetics	NR15 - Annex 11	Health risk, potentially carcinogenic
		Methylene chloride (dichloromethane)	75-09-2	Solvent to produce special varnishes and lacquers. Propellant for aerosols and plastic foam	Directive 1.907/2006/EU (REACH) - Annex XVII (restricted use)	Health risk, potentially carcinogenic

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		Formaldehyde	50-00-0	Intermediate in the manufacture of antioxidants, colourants and products for water treatment. Production of resins, varnishes, paints, adhesives, building materials	Regulation (EU) 2022/1181	Health risks, such as irritation of the respiratory tract and skin, classified as a carcinogen
		Perchloroethylene (tetrachloroethylene)	127-18-4	Industrial application to produce cleaning agents. Solvent degreaser	Directive 1.907/2006/EU (REACH) - Annex XVII (restricted use)	Risk to human health and the environment
		Toluene	108-88-3	Industrial solvent to produce rubbers, paints, coatings and oils Production of commonly used polymers such as nylon, plastics and bottles	NR-15 (Annex 11)	Risk to health and the environment
		Trichloroethylene	79-01-6	Industrial solvent, metal parts degreaser, ingredient in adhesives, paint removal liquids	Directive 1.907/2006/EU (REACH) - Annexes XVII and XIV (Restricted use and subject to authorisations)	Carcinogenic (category 1B) and mutagenic (category 2)
8	Ethers	Polybrominated biphenyls (PBB) including hexabromobisphenyl I (HBB)	67774-32-7	Flame retardant (mainly in plastics). Additive in plastics and resins, flame retardant in paints and varnishes		
		Polybrominated diphenyl ethers (PBDE). Tetra BDE, Penta BDE, Penta BDE (commercial blends)	40088-47-9 5436-43-1 32534-81-9 60348-60-9		EU POPs Regulation 2019/1021 Regulation on Persistent Organic Pollutants (POPs) in the EU	Persistent organic pollutant

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		Hexa BDE, Hepta BDE, Octa BDE, Nona BDE, Deca BDE (commercial mixtures)	36483-60-0 68631-49-2 207122-15-4 68928-80-3 446255-22-7 207122-16-5 32536-52-0 63936-56-1 1163-19-5		Directive 1.907/2006/EU REACH Candidate for authorisation	
9	Polybrominated diphenyl ethers	Hexabromocyclododecane	25637-99-4	Flame retardant in textiles, plastics, foams and expanded polystyrene (Styrofoam)	Regulation on Persistent Organic Pollutants (POPs)	Risk to health and the environment
		Alpha-hexabromocyclododecane	134237-50-6			
		Beta-hexabromocyclododecane	134237-51-7			
		Gamma-hexabromocyclododecane	134237-52-8			
10	Esters	Dimethyl fumarate (DMF)	624-49-7	Antifungal agent in products such as furniture and footwear to prevent the growth of mould during storage and transport.	Decision 2009/251/EC	Health risk, especially severe allergic reactions
11	Esters of phthalic acids (phthalates)	Dibutylphthalate (DBP)	84-74-2	PVC plasticisers Adhesives Used in paint manufacturing industries	Directive 1.907/2006/EU (REACH) - Annex XVII (restricted use)	Health risk, toxic for reproduction
		Diethylhexylphthalate (DEHP)	82208-43-3			
		Butylbenzylphthalate (BBP)	85-68-7		Directive 1.907/2006/EU (REACH) - Annex XVII (restricted use)	Health risk, toxic for reproduction
		Diisodecyl phthalate (DIDP) Diisononyl phthalate (DINP) Din-octyl phthalate (DNOP)	26761-40-0 28553-12-0 117-84-0	Industrial application, used as an additive in the manufacture of plastics, adhesives, sealants and paints	Directive 1.907/2006/EU (REACH) - Annex XVII (restricted use)	Health risk, toxic for reproduction

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12	Formamidines	Amitraz	33089-61-1	Pesticide	Federal Law on Pesticides 7.802/1989	Very toxic to aquatic organisms and can cause allergic skin reactions
13	Phenols	Alkylphenol Ethoxylates (especially octylphenol and nonylphenol)	1806-26-4 68412-54-4	Industrial application, used as an additive in the manufacture of plastics, adhesives and various cleaning materials.	Directive 1.907/2006/EU (REACH)	Environmental and health risk, endocrine toxicity and bioaccumulation capacity
		Bisphenol A (BPA)	80-05-7	Industrial application in the production of polycarbonates, epoxy resin and flame retardants	ANVISA Resolution 41/2011	Health risks, such as changes in the reproductive sector
14	Fluorocarbons	Perfluorinated carbons (PFCs) Perfluoromethane, perfluoroethane, perfluoropropane, perfluorbutane, perfluorocyclobutane and perfluoropentane	678-26-2, 382-28-5, 355-42-0, 335-57-9, 307-34-6, 143356-32-5, 338-84-1	Production of fluorinated polymers, coatings for food packaging and components of fire-fighting foams Surfactant in the emulsion polymerisation of fluoropolymers. Used as an additive for coatings	EU Directive 842/2006	Health and environmental risks, persistent organic pollutants
		Sulphur hexafluoride (SF6)	02551-62-4	Production of fluorinated polymers Insulation for high-voltage equipment (substations)		Risk to the environment, greenhouse gas
		Hydrofluorocarbons (HFCs)	75-46-7, 75-10-5, 593-53-3, 138495-42-8, 354-33-6, 359-35-3, 811-97-2, 430-66-0, 420-46-2, 624-72-6, 75-37-6, 353-36-6, 431-89-0, 677-56-5.	Industrial use for refrigeration (refrigeration gases) Industrial application for the production of organic solvents, fire extinguishers and foams, insulation (extruded polystyrene) Aerosol packaging (sprays)	EU Directive 842/2006 Montreal Protocol of 1989, Quigali Amendment <i>Total phase-out of HCFCs expected by 2045</i>	Risk to the environment

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			431-63-0. 679-86-7, 460-73-1, 406-58-6			
15	Fluorocarbons	Hydrochlorofluorocarbons (HCFCs)	75-43-4 75-45-6 593-70-4 354-14-3 354-21-2 306-83-2 2837-89-0 359-28-4 1649-08-7 75-88-7 1717-00-6 75-68-3 110587-14-9 422-26-4 422-49-1 422-52-6 422-54-8 422-56-0 431-87-8 421-94-3 460-89-9 7125-84-0 425-94-5 460-92-4 666-27-3 460-63-9 460-69-5 134190-50-4 421-41-0 819-00-1 460-35-5 420-97-3 421-02-03 430-55-7	Industrial use for refrigeration (cooling gases) Industrial application to produce organic solvents, fire extinguishers fire-fighting and insulating foams (extruded polystyrene) Aerosol dispensers (sprays)	Ibama Ordinance No. 29 of 4 May 1995 Montreal Protocol of 1989, Quigali Amendment <i>Total phase-out of HCFCs expected by 2040</i>	Risk to the environment
16	Metals	Hexavalent chromium	18540-29-9	Pigment in paints Plastics Tanning of leather Metallurgy, stainless steel, protection of metal parts (oxidation resistance.) Wood preservation	EU Directive 95/2002 NR-15, NR-9,	Group 1 carcinogen, highly toxic to aquatic organisms, soil and groundwater contamination (high mobility in

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						aquatic environments)
		Mercury and its compounds	7439-97-6	Industrial application in instrumentation (automation), electronic equipment and fluorescent lamps Wood preservative (antifouling)	EU Regulation 2017/852 CONAMA (Resolution 401/2008)	Severe risks to human health and the environment
		Nickel and its compounds	7440-02-0 7718-54-9 10028-18-9 13462-88-9 7786-81-4	Industrial application in instrumentation, various electronic devices and batteries Protection of metal parts (oxidation resistance), special steels (stainless steel)	NR-15 (Annex 11), CONAMA Resolution no. 316/2002 Directive (EU) 2022/431	Risk to human health (heavy metal)
		Cadmium and its compounds	7440-43-9	Batteries, electrical and electronic equipment Anti-corrosion coating on metal structures	Regulation (EU) 2023/915	Toxicity and carcinogenic potential
		Lead	7439-92-1	Batteries, electrical and electronic equipment Additive for petrol to improve octane rating Industrial application, mainly in boilermaking Naval painting	Directive 1.907/2006/EU (REACH) and NR-15, Conama Resolution 401/2008	Neurotoxicity, damage to the central and peripheral nervous system, kidneys and cardiovascular system. Bioaccumulative in nature
		Arsenic and compounds	7440-38-2	Electronic equipment Insecticide Leather and wood preservative	Directive 1.907/2006/EU (REACH)	Highly harmful to human health and the environment
		Beryllium and compounds	7440-41-7	Electronic equipment Metal alloys nuclear reactors	NR-15 Directive 2004/37/EC	Toxicity and carcinogenic potential
17	Organotins	Bis-tributyltin oxide and compounds	56-35-9	Industrial application as a stabiliser in antifouling paints	Directive 1.907/2006/EU (REACH)	Health risk as an endocrine disruptor and Toxic to Aquatic

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						Organisms, bioaccumulative
18	Organosulphurs	Heptadecafluorooctane sulphonic acid (PFOS)	1763-23-1	Pesticide used in textile and leather products, fire-fighting foams, metal plating, additives for coatings	Stockholm Convention on Persistent Organic Pollutants (use is highly restricted in the European Union and subject to controls in Brazil)	Environmental persistence, bioaccumulation potential and toxicity

REVISION HISTORY

Revision number	Date	Brief description of the changes
04	27/01/2025	<p>Excluding Isobutane (R-600a), although it is mentioned in the Kyoto protocol, it is a hydrocarbon with a low global warming potential (GWP), and its environmental impact is minimal compared to other refrigerants. The Kigali Amendment to the Montreal Protocol does not impose restrictions or deadlines for discontinuation.</p> <p>HCFCs transferred from the "Prohibited" list to the "Restricted" list.</p> <p>Azinphos-methyl transferred to the Prohibited List.</p> <p>Deletion of the Requirement column and inclusion of the restriction reason column.</p> <p>CAS number for ethoxylated octylphenol (1806-26-4) included.</p>