

## IDENTIFIED USES AND EXPOSURE SCENARIOS FOR PHOSPHORIC ACID

Summary (From LVIC - BREF):

The greatest consumption of phosphoric acid is in the manufacture of phosphate salts as opposed to direct use as acid. Markets are differentiated according to the purity of the acid. The primary application is the production of fertilisers (approximately 80 %) and animal feed supplements (8 %). Purer phosphoric acid is used for the production of industrial phosphates, especially the sodium, potassium, calcium and ammonium salts, and in metal surface treatment. Food grade quality is used for the acidulation of beverages and food grade phosphate salts.

Short Title	ES	Scope/definition	Sectors of Use (SU)	Process Category (PROC)	Product Category (PC) or Article Category (AC)	Environmental Release Category (ERC)
<b>INDUSTRIAL USES</b>						
Manufacture of Phosphoric Acid	IU01	Includes manufacturing, processing and/or purifying concentrated PA-F and PA-P in chemical industry settings: wet-acid production of PA, purification of green acid, thermal route production of PA, purification of technical to food grade PA).	SU3- Industrial uses (Manufacturing All)  SU8 - Manufacture of bulk, large scale chemicals (including petroleum products)  SU9 - Manufacture of fine chemicals	PROC 1 - Use in closed process, no likelihood of exposure  PROC 2 - Use in closed, continuous process with occasional controlled exposure (e.g. sam-pling)  PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises  PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities  PROC 9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC 15 - Use as laboratory reagent	Not Applicable	ERC 1 - Manufacture of substances
Synthesis of chemical products (use as intermediate)	IU02	Use of concentrated fertiliser graded PA for synthesis of solid and liquid mineral fertilisers and use of technical grade PA for synthesis of numerous chemical products as several inorganic phosphates such as STPP, food phosphates, etc.	SU3- Industrial uses (Manufacturing All)  SU8 - Manufacture of bulk, large scale chemicals (including petroleum products)  SU9 - Manufacture of fine chemicals	PROC 1 - Use in closed process, no likelihood of exposure  PROC 2 - Use in closed, continuous process with occasional controlled exposure (e.g. sam-pling)  PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises  PROC 8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Not Applicable	ERC 6A - Industrial use resulting in manufacture of another sub-stance (use of intermediates)

				<p>PROC 9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC 14 - Production of preparations or articles by tableting, compression, extrusion, pelleti-sation</p> <p>PROC 15 - Use as laboratory reagent</p>		
Formulation of mixtures including re-packaging and distribution	IU03	<p>Industrial use of concentrated fertiliser-grade PA and technical or food-grade PA for mixing into final products or diluting to produce lower concentrations and re-packaging and distribution.</p> <p>Including, but not limited to: the use of PA as a fertilizer ingredient for solid and liquid mineral fertilizers, formulation of mixtures of acids for surface treatment of metals, formulation of cleaning agents and anti-freeze products, use as a food additive and as an additive (eg. stabilizer) for other chemicals, cosmetic, pharmaceutical &amp; biocidal products, etc.</p>	<p>SU3- Industrial uses (Manufacturing All)</p> <p>SU10 - Formulation</p>	<p>PROC 1 - Use in closed process, no likelihood of exposure</p> <p>PROC 2 - Use in closed, continuous process with occasional controlled exposure (e.g. sam-pling)</p> <p>PROC 3 - Use in closed batch process (synthesis or formulation)</p> <p>PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC 5 - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC 7 - Industrial spraying</p> <p>PROC 19 - Hand-mixing with intimate contact and only PPE available.</p> <p>PROC 8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC 9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC 14 - Production of preparations or articles by tableting, compression, extrusion, pelleti-sation</p> <p>PROC 15 - Use as laboratory reagent</p>	Not Applicable	<p>ERC 2 - Formulation of preparations</p> <p>ERC 3 - Formulation in materials</p>
Use in metal surface treatment	IU04	<p>Use of concentrated technical-grade PA (alone or in mixture) in "open" applications in industrial settings for metal cleaning, polishing, rust removal, corrosion protection, finishing.</p> <p>Eg. electronic industry (cleaning chips, plasma screens), car industry, ect.</p>	<p>SU3- Industrial uses (Manufacturing All)</p> <p>SU15 -Manufacture of fabricated metal products, except machinery and equipment</p> <p>SU16 - Manufacture of computer, electronic and optical products, electrical equipment</p> <p>SU17 - General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment.</p>	<p>PROC 2 - Use in closed, continuous process with occasional controlled exposure (e.g. sam-pling)</p> <p>PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC 3 - Use in closed batch process (synthesis or formulation)</p> <p>PROC 7 - Industrial spraying</p>	<p>PC7 - Base metals and alloys</p> <p>PC14 - Metal surface treatment products, including galvanic and electroplating products</p>	<p>ERC 4 - Industrial use of processing aids in processes and products, not becoming part of articles</p> <p>ERC 6B - Industrial use of reactive processing aids</p>

				<p>PROC 8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC 9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC 10 - Roller application or brushing</p> <p>PROC 13 - Treatment of articles by dipping and pouring</p> <p>PROC 19 - Hand-mixing with intimate contact and only PPE available.</p> <p>PROC 22 - Potentially closed processing operations with minerals/metals at elevated temperature</p> <p>PROC 23 - Open processing and transfer operations with minerals/metals at elevated temperature</p>		
Acid cleaning agent	IU05	Use of dilute PA as cleaning agent for equipments and facilities in food and agro-food industry, and other industries.	SU3- Industrial uses (Manufacturing All)	<p>PROC 1 - Use in closed process, no likelihood of exposure</p> <p>PROC 2 - Use in closed, continuous process with occasional controlled exposure (e.g. sampling)</p> <p>PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC 5 - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC 7 - Industrial spraying</p> <p>PROC 8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC 9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC 10 - Roller application or brushing</p> <p>PROC 13 - Treatment of articles by dipping and pouring</p> <p>PROC 19 - Hand-mixing with intimate contact and only PPE available.</p>	<p>PC0 - Other products</p> <p>PC35 - Washing and Cleaning Products (including solvent based products)</p>	<p>ERC 4 - Industrial use of processing aids in processes and products, not becoming part of articles</p> <p>ERC 6B - Industrial use of reactive processing aids</p>
Processing aid in chemical industry and	IU06	Industrial settings handling concentrated technical-grade acid as pH regulator,	SU3- Industrial uses (Manufacturing All)	<p>PROC 1 - Use in closed process, no likelihood of exposure</p>	<p>PC1 - Adhesives, Sealants</p>	<p>ERC 6B - Industrial use of reactive processing aids</p>

<p>other industries (including lab applications)</p>	<p>neutralization agent, oxidizing agent, catalyze, etc.  Typical application in manufacturing industries as textiles, pulp and paper, food and feed, pharmaceuticals, pigments, batteries, kaolin, activated carbon, resins, plastics, polymers, etc. Industrial oil and biodiesel treatment (degumming). Use in manufacture of refractory as binding agent. Use as a hardeners for casting moulds  Includes use as additive in industrial water treatment (eg. boiler water), drinking water treatment and biological waste-water treatment (P source).  Includes also uses as lab acid agent.</p>	<p>PROC 2 - Use in closed, continuous process with occasional controlled exposure (e.g. sam-pling)   PROC 3 - Use in closed batch process (synthesis or formulation)  PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises   PROC 5 - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)  PROC 7 - Industrial spraying   PROC 8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities  PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities  PROC 9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  PROC 13 - Treatment of articles by dipping and pouring  PROC 15 - Use as laboratory reagent   PROC 23 - Open processing and transfer operations with minerals/metals at elevated tempera-ture   PROC 22 - Potentially closed processing operations with minerals/metals at elevated tempera-ture</p>	<p>PC9a - Coatings and Paints, Thinners, paint remov-ers   PC9b - Fillers, Putties , Plasters, Modelling clay  PC13 - Fuels   PC19 - Intermediate   PC20 - Products such as ph-regulators, flocculants, precipitants, neutralization agents, other un-specific  PC21 - Laboratory Chemicals   PC23 - Leather tanning, dye, finishing, impregnation and care produts  PC24 - Lubricants, Greases and Release Products   PC25 - Metal Working Fluids   PC26 - Paper and board dye, finishing and impregna-tion products: including bleaches and other processing aids;  PC32 - Polymer Preparations and Compounds   PC34 - Textile dyes, finishing and impregnating products; including bleaches and other proc-essing aids;   PC37 - Water treatment chemicals   PC39 - Cosmetics, personal care products</p>	<p>ERC 6D - Industrial use of auxiliaries for polymerisation processes in production of resins, rubbers, polymers</p>
--	--	--	--	---

**PROFESSIONAL USES**

<p>Use of fertilizers containing phosphoric acid</p>	<p>IU07 Use of liquid and soluble liquid or solid fertilizers (Fe 1.3/ Fe 2.3) in industrilized agricultural facilities and small farms. It includes transfer, loading, unloading, dilution operations, surface spreading or incorporation thorough pipes at open fields.  Fertilization of amenity (parks, public lawns</p>	<p>SU22 - Professional uses   SU1 - Agriculture, forestry, fishery</p>	<p>PROC 5 - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)   PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p>	<p>PC12 - Fertilizers</p>	<p>ERC 8E - Wide dispersive outdoor use of reactive substances in open systems   ERC 8B - Wide dispersive indoor use of reactive substances in open systems</p>
--	--	--	---	---------------------------	---

		Fertilization of amenity (parks, public lawns, sport fields, golf courses)		<p>PROC 9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC 13 - Treatment of articles by dipping and pouring</p> <p>PROC 11 - Non industrial spraying</p> <p>PROC 19 - Hand-mixing with intimate contact and only PPE available.</p>		
Metal surface treatment	IU08	Use of dilute acids for rust removal by workers in garages and small workshops.	SU22 - Professional uses	<p>PROC 10 - Roller application or brushing</p> <p>PROC 11 - Non industrial spraying</p> <p>PROC 13 - Treatment of articles by dipping and pouring</p> <p>PROC 19 - Hand-mixing with intimate contact and only PPE available.</p>	PC14 - Metal surface treatment products, including galvanic and electroplating products	<p>ERC 8A - Wide dispersive indoor use of processing aids in open systems</p> <p>ERC 8B - Wide dispersive indoor use of reactive substances in open systems</p> <p>ERC 8C - Wide dispersive indoor use resulting in inclusion into or onto a matrix</p> <p>ERC 8E - Wide dispersive outdoor use of reactive substances in open systems</p>
Construction applications	IU09	Use in construction and building work to remove mineral deposits, cementitious smears, and hard water stains. (Dilute??)	<p>SU22 - Professional uses</p> <p>SU19 - Building and construction work</p>	<p>PROC 10 - Roller application or brushing</p> <p>PROC 11 - Non industrial spraying</p> <p>PROC 13 - Treatment of articles by dipping and pouring</p> <p>PROC 19 - Hand-mixing with intimate contact and only PPE available.</p>	<p>PC9a - Coatings and Paints, Thinners, paint removers</p> <p>PC9b - Fillers, Putties, Plasters, Modelling clay</p> <p>PC15 - Non-metal-surface treatment products</p>	<p>ERC 8B - Wide dispersive indoor use of reactive substances in open systems</p> <p>ERC 8E - Wide dispersive outdoor use of reactive substances in open systems</p>
Detergent, cleaning agent	IU10	Use of dilute PA as cleaning agent in laundries, hospitals, ext (professional settings)	SU22 - Professional uses	<p>PROC 8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC 9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC 10 - Roller application or brushing</p> <p>PROC 13 - Treatment of articles by dipping and pouring</p> <p>PROC 11 - Non industrial spraying</p> <p>PROC 19 - Hand-mixing with intimate contact and only PPE available.</p>	<p>PC35 - Washing and Cleaning Products (including solvent based products)</p> <p>PC31 - Polishes and Wax Blends</p> <p>PC37 - Water treatment chemicals</p>	<p>ERC 8B - Wide dispersive indoor use of reactive substances in open systems</p> <p>ERC 8A - Wide dispersive indoor use of processing aids in open systems</p>

Soldering aid	IU11	Use as flux in soldering in dedicated workshops.	SU22 - Professional uses	PROC 25 - Other hot work operations with metals Welding, soldering, gouging, brazing, flame cutting	PC38 - Welding and soldering products, flux products	ERC 8B - Wide dispersive indoor use of reactive substances in open systems  ERC 8E - Wide dispersive outdoor use of reactive substances in open systems
<b>CONSUMER USES</b>						
Polishes and waxes	IU12	Use of polishes in spray and waxes/cream (floor, furniture, shoes) where PA is co-formulant.	SU21 - Consumer uses	Not Applicable	PC31 - Polishes and Wax Blends	ERC 8A - Wide dispersive indoor use of processing aids in open systems  ERC 8D - Wide dispersive outdoor use of processing aids in open systems
Washing and cleaning products.	IU13	Household washing and cleaning products containing PA (to remove mineral deposits and hard water stains).	SU21 - Consumer uses	Not Applicable	PC35 - Washing and Cleaning Products (including solvent based products)	ERC 8A - Wide dispersive indoor use of processing aids in open systems  ERC 8B - Wide dispersive indoor use of reactive substances in open systems
Soldering aid	IU14	Use as flux in soldering (consumer use = do-it-yourself kits)	SU21 - Consumer uses	Not Applicable	PC38 - Welding and soldering products, flux products	ERC 8B - Wide dispersive indoor use of reactive substances in open systems  ERC 8E - Wide dispersive outdoor use of reactive substances in open systems
Use of fertilizers containing phosphoric acid	IU15	Use of liquid and soluble liquid or solid fertilizers. It includes transfer, loading, unloading, dilution operations, surface spreading of minor quantities for indoor/ outdoor home fertilizer use.	SU21 - Consumer uses		PC12 - Fertilizers	ERC 8E - Wide dispersive outdoor use of reactive substances in open systems  ERC 8B - Wide dispersive indoor use of reactive substances in open systems
Use of batteries containing phosphoric acid	IU16	Electrolyte in batteries, fuel cells, other closed systems	SU21 - Consumer uses	Not Applicable	PC0 - Other products	ERC 10A - Wide dispersive outdoor use of long-life articles and materials with low release

						ERC 11A - Wide dispersive indoor use of long-life articles and materials with low release
Cosmetics additive	N/A	Use of cosmetics and skin care products containing PA (pH adjuster).	SU21 - Consumer uses	Not Applicable	PC39 - Cosmetics, personal care products PC28 - Perfumes, Fragrances	ERC 11A - Wide dispersive indoor use of long-life articles and materials with low release ERC 8A - Wide dispersive indoor use of processing aids in open systems
Drinks and food additive	N/A	Drinks and foods consumption (PA pH adjuster and flavour additive)	SU21 - Consumer uses	Not Applicable	PC0 - Other products	