

SAFETY DATA SHEET

Date Updated: 2012-04-25

Version: -

Regulation: In accordance with Regulation (EU) 453/2010 (REACH), Annex II

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

1.1 Product identifier

Name of product: FLAMDANT (Magnesium hydroxide)
 Synonyms: Magnesium dihydroxide
 CAS #: 1309-42-8
 EC #: 215-170-3
 Pre-registration #: 05-2116374391-45-0000

1.2 Relevant identified uses of the substance or mixture and uses advised against

Uses by workers in industrial settings

Identified Use (IU) name	Process Category (PROC)	Environmental Release Category (ERC)	Substance supplied to that use in form of	Product Category (PC)	Sector of Use (SU)	Subsequent service life relevant for that use	Article Category (AC)	Exposure scenario reference in the CSR
IU number 1 : Polymer processing	PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure 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 6 : Calendering operations PROC 8a : Transfer of	ERC 3 : Formulation in material	N/A	PC 32 : Polymer preparations and compounds	SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys)	N/A	N/A	N/A

	<p>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 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 21 : Low energy manipulation of substances bound in materials and/or articles</p>							
<p>IU number 2 : Manufacture of Magnesium hydroxide</p>	<p>PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure 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</p>	<p>ERC 1 : Manufacture of substances</p>	N/A	<p>PC 0 : Other: Flame retardants</p>	<p>SU 8 : Manufacture of bulk, large scale chemicals (including petroleum products) SU 9 : Manufacture of fine chemicals</p>	N/A	N/A	N/A

	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							
IU number 3 : Industrial production of plastics and rubber	PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure 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 6 : Calendering operations 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 14 : Production of preparations or articles	ERC 3 : Formulation in materials ERC 5 : Industrial use resulting in inclusion into or onto a matrix ERC 6a : Industrial use resulting in manufacture of another substance (use of intermediates) ERC 6c : Industrial use of monomers for manufacture of thermoplastics ERC	N/A	PC 32 : Polymer preparations and compounds	SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys) SU 11 : Manufacture of rubber products SU 12 : Manufacture of plastics products, including compounding and conversion	N/A	N/A	N/A

	<p>by tableting, compression, extrusion, pelletisation</p> <p>PROC 15 : Use as laboratory reagent</p> <p>PROC 19 : Hand-mixing with intimate contact and only PPE available</p> <p>PROC 21 : Low energy manipulation of substances bound in materials and/or articles</p> <p>PROC 24 : High (mechanical) energy work-up of substances bound in materials and/or articles</p>	<p>6d : Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers</p>						
<p>IU number 4 : Formulation of flame retardants</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</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 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</p>	<p>ERC 2 : Formulation of preparations</p>	N/A	<p>PC 0 : Other: Flame retardants</p>	<p>SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys)</p>	N/A	N/A	N/A

	facilities PROC 9 : Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC 15 : Use as laboratory reagent							
IU number 5 : Compound s used in transport industry	PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 21 : Low energy manipulation of substances bound in materials and/or articles	ERC 11a : Wide dispersi ve indoor use of long-life articles and material s with low release	N/A	PC 32 : Polymer preparatio ns and compoun ds	SU 17 : General manufacturi ng, e.g. machinery, equipment, vehicles, other transport equipment	N/A	AC 1 : Vehicles	N/A
IU number 6 : Compound s used in electrical application	PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 21 : Low energy manipulation of substances bound in materials and/or articles	ERC 11a : Wide dispersi ve indoor use of long-life articles and material s with low release	N/A	PC 32 : Polymer preparatio ns and compoun ds	SU 16 : Manufactur e of computer, electronic and optical products, electrical equipment	N/A	AC 2 : Machiner y, mechanic al appliance, electrical/ electronic articles	N/A
IU number 7 : Compound s used in constructio n	PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 21 : Low energy manipulation of substances bound in materials and/or articles	ERC 10a : Wide dispersi ve outdoor use of long-life articles and material s with low	N/A	PC 32 : Polymer preparatio ns and compoun ds	SU 19 : Building and constructio n work	N/A	AC 4 : Stone, plaster, cement, glass and ceramic articles AC 7 : Metal articles AC 13 : Plastic	N/A

		release					articles	
IU number 8 : Use in coatings, inks, paints and roofing	PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure 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 10 : Roller application or brushing PROC 13 : Treatment of articles by dipping and pouring PROC 15 : Use as laboratory reagent	ERC 3 : Formulation in materials ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles ERC 5 : Industrial use resulting in inclusion into or onto a matrix ERC 6a : Industrial use resulting in manufacture of another substance (use of intermediates) ERC 6c : Industrial use of monomers for manufacture of thermop	N/A	PC 1 : Adhesives, Sealants PC 4 : Anti-freeze and de-icing products PC 9a : Coatings and paints, thinners, paint removes PC 9b : Fillers, putties, plasters, modelling clay PC 18 : Ink and toners PC 23 : Leather tanning, dye, finishing, impregnation and care products PC 24 : Lubricants, greases, release products PC 31 : Polishes and wax blends PC 32 : Polymer preparations and compounds PC 34 :	SU 0 : Other: Industrial uses SU 5 : Manufacture of textiles, leather, fur SU 8 : Manufacture of bulk, large scale chemicals (including petroleum products)	N/A	N/A	N/A

		lastics ERC 6d : Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers		Textile dyes, finishing and impregnating products; including bleaches and other processing aids				
IU number 9 : Flame retardant additive for fire extinguishing compositions	PROC 3 : Use in closed batch process (synthesis or formulation)	ERC 2 : Formulation of preparations	N/A	PC 0 : Other: Flame retardants	SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys)	N/A	N/A	N/A
IU number 10 : Recycling plastics	PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 21 : Low energy manipulation of substances bound in materials and/or articles	ERC 3 : Formulation in materials	N/A	PC 32 : Polymer preparations and compounds	SU 0 : Other: Recycling	N/A	N/A	N/A
IU number 11 : Use in chemical industry (neutralization of wastewaters, flue gas)	PROC 2 : Use in closed, continuous process with occasional controlled exposure 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 7 : Industrial	ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles	N/A	PC 20 : Products such as ph-regulators, flocculants, precipitants, neutralisation agents	SU 9 : Manufacture of fine chemicals SU 23 : Electricity, steam, gas water supply and sewage treatment	N/A	N/A	N/A

	spraying	ERC 8b : Wide dispersive indoor use of reactive substances in open systems						
IU number 12 : Use as diacidification agent for paper	PROC 7 : Industrial spraying PROC 11 : Non industrial spraying	ERC 5 : Industrial use resulting in inclusion into or onto a matrix ERC 8c : Wide dispersive indoor use resulting in inclusion into or onto a matrix	N/A	PC 26 : Paper and board dye, finishing and impregnation products; including bleaches and other processing aids	SU 6b : Manufacture of pulp, paper and paper products	N/A	AC 8 : Paper articles	N/A
IU number 13 : Use as pH regulator (metal precipitation waste water)	PROC 4 : Use in batch and other process (synthesis) where opportunity for exposure arises	ERC 6b : Industrial use of reactive processing aids	N/A	PC 20 : Products such as ph-regulators, flocculants, precipitants, neutralisation agents	SU 23 : Electricity, steam, gas water supply and sewage treatment	YES	N/A	N/A
IU number 14 : Use as reactant in	PROC 2 : Use in closed, continuous process with occasional controlled	ERC 4 : Industrial use of	N/A	PC 20 : Products such as	SU 6b : Manufacture of pulp,	N/A	AC 8 : Paper	N/A

paper peroxide bleaching	exposure	processing aids in processes and products, not becoming part of articles		ph-regulators, flocculants, precipitants, neutralisation agents	paper and paper products		articles	
IU number 15 : Production of corrosion inhibitors	PROC 3 : Use in closed batch process (synthesis or formulation) PROC 5 : Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	ERC 2 : Formulation of preparations	N/A	PC 24 : Lubricants, greases, release products	SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys)	N/A	N/A	N/A
IU number 16 : Use as corrosion inhibitor (gas turbines and boilers)	PROC 16 : Using material as fuel sources, limited exposure to unburned product to be expected	ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles ERC 6b : Industrial use of reactive processing aids	N/A	PC 19 : Intermediate PC 24 : Lubricants, greases, release products	SU 23 : Electricity, steam, gas water supply and sewage treatment	N/A	N/A	N/A
IU number 17 : Production of magnesium compounds	PROC 1 : Use in closed process, no likelihood of exposure	ERC 1 : Manufacture of substances ERC 6b : Industrial use of	N/A	PC 19 : Intermediate PC 21 : Laboratory Chemicals	SU 9 : Manufacture of fine chemicals	N/A	N/A	N/A

		reactive processing aids						
IU number 18 : Manufacture of pharmaceutical preparations	PROC 1 : Use in closed process, no likelihood of exposure	ERC 2 : Formulation of preparations	N/A	PC 29 : Pharmaceuticals	SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys)	N/A	N/A	N/A
IU number 19 : Manufacture of pharmaceutical preparations	PROC 1 : Use in closed process, no likelihood of exposure	ERC 2 : Formulation of preparations	N/A	PC 29 : Pharmaceuticals	SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys)	N/A	N/A	N/A
IU number 20 : Use as abrasives for glass industry, ceramics and stones	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 PROC 9 : Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC 10 : Roller application or brushing PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 22 : Potentially closed processing operations with	ERC 5 : Industrial use resulting in inclusion into or onto a matrix ERC 12a : Industrial processing of articles with abrasive techniques (low release)	N/A	PC 14 : Metal surface treatment products, including galvanic and electroplating products PC 15 : Non-metal-surface treatment products PC 21 : Laboratory Chemicals	SU 0 : Other: Manufacture and finishing of glass, ceramics and stone (NACE codes C23.1, C23.3 and C23.7)	N/A	N/A	N/A

	minerals/metals at elevated temperature. Industrial setting							
IU number 21 : Use in PVC stabilizer	PROC 5 : Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	ERC 2 : Formulation of preparations	N/A	PC 12 : Fertilisers PC 32 : Polymer preparations and compounds	SU 12 : Manufacture of plastics products, including compounding and conversion	N/A	N/A	N/A
IU number 22 : Use in production of fertilisers	PROC 5 : Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	ERC 2 : Formulation of preparations	N/A	PC 12 : Fertilisers	SU 1 : Agriculture, forestry and fishery	N/A	N/A	N/A
IU number 23 : Use in construction	PROC 3 : Use in closed batch process (synthesis or formulation) PROC 5 : Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC 6 : Calendering operations 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 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation	ERC 2 : Formulation of preparations ERC 5 : Industrial use resulting in inclusion into or onto a matrix	N/A	PC 19 : Intermediate	SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys) SU 19 : Building and construction work	N/A	AC 13 : Plastic articles	N/A

<p>IU number 24 : Use in cleaning agents</p>	<p>PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure PROC 4 : Use in batch and other process (synthesis) where opportunity for exposure arises 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 10 : Roller application or brushing PROC 13 : Treatment of articles by dipping and pouring</p>	<p>ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles</p>	<p>N/A</p>	<p>PC 3 : Air care products PC 4 : Anti-freeze and de-icing products PC 9a : Coatings and paints, thinners, paint removers PC 9b : Fillers, putties, plasters, modelling clay PC 24 : Lubricants, greases, release products</p>	<p>SU 0 : Other:</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>
<p>IU number 25 : Use in oil field operations</p>	<p>PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure 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</p>	<p>ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles</p>	<p>N/A</p>	<p>PC 0 : Other: Oilfield chemicals</p>	<p>SU 0 : Other: Industrial use: processing aids</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>

	containers at dedicated facilities PROC 9 : Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC 10 : Roller application or brushing							
IU number 26 : Use in lubricants	PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure 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 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 10 : Roller application or brushing PROC 17 : Lubrication at high energy conditions and in partly open process	ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles ERC 7 : Industrial use of substances in closed systems	N/A	PC 1 : Adhesives, Sealants PC 24 : Lubricants, greases, release products PC 31 : Polishes and wax blends	SU 0 : Other: Industrial lubricants	N/A	N/A	N/A

<p>IU number 26 : Use in metal working fluids/rolling oils</p>	<p>PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure PROC 3 : Use in closed batch process (synthesis or formulation) 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 10 : Roller application or brushing PROC 13 : Treatment of articles by dipping and pouring PROC 17 : Lubrication at high energy conditions and in partly open process</p>	<p>ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles</p>	<p>N/A</p>	<p>PC 25 : Metal working fluids</p>	<p>SU 0 : Other: Industrial use: processing aids</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>
<p>IU number 27 : Use in blowing agents</p>	<p>PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with</p>	<p>ERC 4 : Industrial use of processing aids</p>	<p>N/A</p>	<p>PC 0 : Other: Processing aids</p>	<p>SU 0 : Other: Industrial use: processing</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>

	occasional controlled exposure PROC 3 : Use in closed batch process (synthesis or formulation) 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 12 : Use of blowing agents in manufacture of foam	in processes and products, not becoming part of articles			aids			
IU number 28 : Use in binders and release agents	PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure 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 6 : Calendering operations PROC 7 : Industrial spraying PROC 8b : Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 10 : Roller application or brushing PROC 14 : Production of preparations or articles by tableting, compression, extrusion,	ERC 5 : Industrial use resulting in inclusion into or onto a matrix	N/A	PC 0 : Other: Binders and release agents	SU 0 : Other: Industrial uses	N/A	N/A	N/A

	pelletisation							
IU number 29 : Use as fuel	PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure 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 PROC 16 : Using material as fuel sources, limited exposure to unburned product to be expected	ERC 8b : Wide dispersi ve indoor use of reactive substanc es in open systems	N/A	PC 13 : Fuels	SU 0 : Other: Industrial uses	N/A	N/A	N/A

Uses by professional workers

Identified Use (IU) name	Process Category (PROC)	Environmental Release Category (ERC)	Substance supplied to that use in form of	Product Category (PC)	Sector of Use (SU)	Subsequent service life relevant for that use	Article Category (AC)	Exposure scenario reference in the CSR
IU number 1 : Polymer processing	PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled	ERC 3 : Formulation in materials	N/A	PC 32 : Polymer preparations and compounds	SU 10 : Formulation [mixing] of preparations and/or re-	N/A	N/A	N/A

	<p>exposure</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 6 : Calendering operations</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 13 : Treatment of articles by dipping and pouring</p> <p>PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p>PROC 21 : Low energy manipulation of substances bound in materials and/or articles</p>				packaging (excluding alloys)			
IU number 2 : Manufacture of Magnesium	<p>PROC 1 : Use in closed process, no likelihood of exposure</p> <p>PROC 2 : Use in closed, continuous process with occasional controlled</p>	ERC 1 : Manufacture of substances	N/A	PC 0 : Other: Flame retardants	SU 8 : Manufacture of bulk, large scale chemicals (including	N/A	N/A	N/A

hydroxide	<p>exposure</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 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 15 : Use as laboratory reagent</p>				<p>petroleum products)</p> <p>SU 9 : Manufacture of fine chemicals</p>			
<p>IU number 3 :</p> <p>Industrial production of plastics and rubber</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</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 6 : Calendering operations</p> <p>PROC 8a : Transfer of</p>	<p>ERC 3 : Formulation in materials</p> <p>ERC 5 : Industrial use resulting in inclusion into or onto a matrix</p> <p>ERC 6a : Industrial use resulting in manufacture of another substance (use of</p>	N/A	<p>PC 32 : Polymer preparations and compounds</p>	<p>SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys)</p> <p>SU 11 : Manufacture of rubber products</p> <p>SU 12 : Manufacture of plastics products, including compounding and conversion</p>	N/A	N/A	N/A

	<p>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 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 15 : Use as laboratory reagent PROC 19 : Hand-mixing with intimate contact and only PPE available PROC 21 : Low energy manipulation of substances bound in materials and/or articles PROC 24 : High (mechanical) energy work-up of substances bound in materials and/or articles</p>	<p>intermediates) ERC 6c : Industrial use of monomers for manufacture of thermoplastics ERC 6d : Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers</p>						
<p>IU number 4 : Formulation of flame retardants</p>	<p>PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure 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 8a : Transfer of substance or preparation</p>	<p>ERC 2 : Formulation of preparations</p>	N/A	<p>PC 0 : Other: Flame retardants</p>	<p>SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys)</p>	N/A	N/A	N/A

	(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 15 : Use as laboratory reagent							
IU number 5 : Compound s used in transport industry	PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 21 : Low energy manipulation of substances bound in materials and/or articles	ERC 11a : Wide dispersive indoor use of long-life articles and materials with low release	N/A	PC 32 : Polymer preparations and compounds	SU 17 : General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment	N/A	AC 1 : Vehicles	N/A
IU number 6 : Compound s used in electrical application	PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 21 : Low energy manipulation of substances bound in materials and/or articles	ERC 11a : Wide dispersive indoor use of long-life articles and materials with low release	N/A	PC 32 : Polymer preparations and compounds	SU 16 : Manufacture of computer, electronic and optical products, electrical equipment	N/A	AC 2 : Machinery, mechanical appliances, electrical/electronic articles	N/A
IU number 7 : Compound s used in construction	PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 21 : Low energy manipulation of substances bound in materials and/or articles	ERC 10a : Wide dispersive outdoor use of long-life articles and materials with low	N/A	PC 32 : Polymer preparations and compounds	SU 19 : Building and construction work	N/A	AC 4 : Stone, plaster, cement, glass and ceramic articles AC 7 : Metal	N/A

		release					articles AC 13 : Plastic articles	
IU number 8 : Use in coatings, inks, paints and roofing	PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure 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 10 : Roller application or brushing PROC 13 : Treatment of articles by dipping and pouring PROC 15 : Use as laboratory reagent	ERC 3 : Formulati on in materials ERC 4 : Industrial use of processin g aids in processes and products, not becoming part of articles ERC 5 : Industrial use resulting in inclusion into or onto a matrix ERC 6a : Industrial use resulting in manufact ure of another substance (use of intermedi ates) ERC 6c : Industrial use of monomer s for manufact ure of thermopla stics	N/A	PC 1 : Adhesives , Sealants PC 4 : Anti- freeze and de-icing products PC 9a : Coatings and paints, thinners, paint removes PC 9b : Fillers, putties, plasters, modelling clay PC 18 : Ink and toners PC 23 : Leather tanning, dye, finishing, impregnat ion and care products PC 24 : Lubricant s, greases, release products PC 31 : Polishes and wax blends PC 32 : Polymer preparatio ns and	SU 0 : Other: Industrial uses SU 5 : Manufactur e of textiles, leather, fur SU 8 : Manufactur e of bulk, large scale chemicals (including petroleum products)	N/A	N/A	N/A

		ERC 6d : Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers		compound PC 34 : Textile dyes, finishing and impregnating products; including bleaches and other processing aids				
IU number 9 : Flame retardant additive for fire extinguishing compositions	PROC 3 : Use in closed batch process (synthesis or formulation)	ERC 2 : Formulation of preparations	N/A	PC 0 : Other: Flame retardants	SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys)	N/A	N/A	N/A
IU number 10 : Recycling plastics	PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 21 : Low energy manipulation of substances bound in materials and/or articles	ERC 3 : Formulation in materials	N/A	PC 32 : Polymer preparations and compounds	SU 0 : Other: Recycling	N/A	N/A	N/A
IU number 11 : Use in chemical industry (neutralization of wastewater, flue gas)	PROC 2 : Use in closed, continuous process with occasional controlled exposure 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 7 : Industrial spraying	ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles ERC 8b : Wide dispersive indoor use of	N/A	PC 20 : Products such as ph-regulators, flocculants, precipitants, neutralisation agents	SU 9 : Manufacture of fine chemicals SU 23 : Electricity, steam, gas water supply and sewage treatment	N/A	N/A	N/A

		reactive substances in open systems						
IU number 12 : Use as diacidification agent for paper	PROC 7 : Industrial spraying PROC 11 : Non industrial spraying	ERC 5 : Industrial use resulting in inclusion into or onto a matrix ERC 8c : Wide dispersive indoor use resulting in inclusion into or onto a matrix	N/A	PC 26 : Paper and board dye, finishing and impregnation products; including bleaches and other processing aids	SU 6b : Manufacture of pulp, paper and paper products	N/A	AC 8 : Paper articles	N/A
IU number 13 : Use as pH regulator (metal precipitation waste water)	PROC 4 : Use in batch and other process (synthesis) where opportunity for exposure arises	ERC 6b : Industrial use of reactive processing aids	N/A	PC 20 : Products such as ph-regulators, flocculants, precipitants, neutralisation agents	SU 23 : Electricity, steam, gas water supply and sewage treatment	YES	N/A	N/A
IU number 14 : Use as reactant in paper peroxide bleaching	PROC 2 : Use in closed, continuous process with occasional controlled exposure	ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles	N/A	PC 20 : Products such as ph-regulators, flocculants, precipitants, neutralisation agents	N/A	N/A	AC 8 : Paper articles	N/A

IU number 15 : Production of corrosion inhibitors	PROC 3 : Use in closed batch process (synthesis or formulation) PROC 5 : Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	ERC 2 : Formulation of preparations	N/A	PC 24 : Lubricants, greases, release products	SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys)	N/A	N/A	N/A
IU number 16 : Use as corrosion inhibitor (gas turbines and boilers)	PROC 16 : Using material as fuel sources, limited exposure to unburned product to be expected	ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles ERC 6b : Industrial use of reactive processing aids	N/A	PC 19 : Intermediate PC 24 : Lubricants, greases, release products	SU 23 : Electricity, steam, gas water supply and sewage treatment	N/A	N/A	N/A
IU number 17 : Production of magnesium compounds	PROC 1 : Use in closed process, no likelihood of exposure	ERC 1 : Manufacture of substances ERC 6b : Industrial use of reactive processing aids	N/A	PC 19 : Intermediate PC 21 : Laboratory Chemicals	SU 9 : Manufacture of fine chemicals	N/A	N/A	N/A
IU number 18 : Manufacture of pharmaceutical preparations	PROC 1 : Use in closed process, no likelihood of exposure	ERC 2 : Formulation of preparations	N/A	PC 29 : Pharmaceuticals	SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys)	N/A	N/A	N/A

IU number 19 : Use as abrasives for glass industry, ceramics and stones	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 PROC 9 : Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC 10 : Roller application or brushing PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 22 : Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting	ERC 5 : Industrial use resulting in inclusion into or onto a matrix ERC 12a : Industrial processing of articles with abrasive techniques (low release)	N/A	PC 14 : Metal surface treatment products, including galvanic and electroplating products PC 15 : Non-metal-surface treatment products PC 21 : Laboratory Chemicals	SU 0 : Other: Manufacture and finishing of glass, ceramics and stone (NACE codes C23.1, C23.3 and C23.7)	N/A	N/A	N/A
IU number 20 : Use in PVC stabilizer	PROC 3 : Use in closed batch process (synthesis or formulation)	ERC 3 : Formulation in materials ERC 5 : Industrial use resulting in inclusion into or onto a matrix	N/A	PC 32 : Polymer preparations and compounds	SU 12 : Manufacture of plastics products, including compounding and conversion	N/A	N/A	N/A
IU number 21 : Use in production of fertilisers	PROC 5 : Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	ERC 2 : Formulation of preparations	N/A	PC 12 : Fertilisers	SU 1 : Agriculture, forestry and fishery	N/A	N/A	N/A

<p>IU number 22 : Use in production of fertilisers</p>	<p>PROC 3 : Use in closed batch process (synthesis or formulation) PROC 5 : Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC 6 : Calendering operations 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 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation</p>	<p>ERC 2 : Formulation of preparations ERC 5 : Industrial use resulting in inclusion into or onto a matrix</p>	<p>N/A</p>	<p>PC 19 : Intermediate</p>	<p>SU 10 : Formulation [mixing] of preparations and/or re-packaging (excluding alloys) SU 19 : Building and construction work</p>	<p>N/A</p>	<p>AC 13 : Plastic articles</p>	<p>N/A</p>
<p>IU number 23 : Use in cleaning agents</p>	<p>PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure PROC 4 : Use in batch and other process (synthesis) where opportunity for exposure arises 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</p>	<p>ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles</p>	<p>N/A</p>	<p>PC 3 : Air care products PC 4 : Anti-freeze and de-icing products PC 9a : Coatings and paints, thinners, paint removes PC 9b : Fillers, putties, plasters, modelling clay PC 24 : Lubricant</p>	<p>SU 0 : Other: Industrial use: processing aids</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>

	containers at dedicated facilities PROC 10 : Roller application or brushing PROC 13 : Treatment of articles by dipping and pouring			s, greases, release products PC 35 : Washing and cleaning products (including solvent based products)				
IU number 24 : Use in construction	PROC 3 : Use in closed batch process (synthesis or formulation) PROC 5 : Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC 6 : Calendering operations 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 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation	ERC 2 : Formulation of preparations ERC 5 : Industrial use resulting in inclusion into or onto a matrix	N/A	PC 19 : Intermediate	SU 10 : Formulation [mixing] of preparations and/or repackaging (excluding alloys) SU 19 : Building and construction work	N/A	AC 13 : Plastic articles	N/A
IU number 25 : Use in oil field operations	PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure PROC 3 : Use in closed batch process (synthesis or formulation)	ERC 4 : Industrial use of processing aids in processes and products, not becoming	N/A	PC 0 : Other: Oilfield chemicals	SU 0 : Other: Industrial use: processing aids	N/A	N/A	N/A

	<p>PROC 4 : Use in batch and other process (synthesis) where opportunity for exposure arises</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>	part of articles						
IU number 26 : Use in lubricants	<p>PROC 1 : Use in closed process, no likelihood of exposure</p> <p>PROC 2 : Use in closed, continuous process with occasional controlled exposure</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 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>ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles</p> <p>ERC 7 : Industrial use of substances in closed systems</p>	N/A	<p>PC 1 : Adhesives, Sealants</p> <p>PC 24 : Lubricants, greases, release products</p> <p>PC 31 : Polishes and wax blends</p>	<p>SU 0 : Other: Industrial lubricants</p>	N/A	N/A	N/A

	PROC 10 : Roller application or brushing PROC 13 : Treatment of articles by dipping and pouring PROC 17 : Lubrication at high energy conditions and in partly open process							
IU number 27 : Use in metal working fluids/rolling oils	PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure PROC 3 : Use in closed batch process (synthesis or formulation) 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 10 : Roller application or brushing PROC 13 : Treatment of articles by dipping and pouring PROC 17 : Lubrication at high energy conditions and	ERC 4 : Industrial use of processing aids in processes and products, not becoming part of articles	N/A	PC 25 : Metal working fluids	SU 0 : Other: Industrial use: processing aids	N/A	N/A	N/A

	in partly open process							
IU number 28 : Use in blowing agents	PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure 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 6 : Calendering operations PROC 7 : Industrial spraying PROC 8b : Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 10 : Roller application or brushing PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation	ERC 5 : Industrial use resulting in inclusion into or onto a matrix	N/A	PC 0 : Other: Binders and release agents	SU 0 : Other: Industrial uses	N/A	N/A	N/A
IU number 29 : Use in binders and release agents	PROC 1 : Use in closed process, no likelihood of exposure PROC 2 : Use in closed, continuous process with occasional controlled exposure 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 6 : Calendering operations PROC 7 : Industrial spraying	ERC 5 : Industrial use resulting in inclusion into or onto a matrix	N/A	PC 0 : Other: Binders and release agents	SU 0 : Other: Industrial uses	N/A	N/A	N/A

	PROC 8b : Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 10 : Roller application or brushing PROC 14 : Production of preparations or articles by tableting, compression, extrusion, pelletisation							
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Uses by consumers

Identified Use (IU) name	Process Category (PROC)	Environmental Release Category (ERC)	Substance supplied to that use in form of	Product Category (PC)	Sector of Use (SU)	Subsequent service life relevant for that use	Article Category (AC)	Exposure scenario reference in the CSR
IU number 1 : Use in coatings, inks, paints and roofing	N/A	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	N/A	PC 1 : Adhesives, Sealants PC 4 : Anti-freeze and de-icing products PC 9a : Coatings and paints, thinners, paint removes PC 9b : Fillers, putties, plasters, modelling clay PC 18 : Ink and toners PC 23 : Leather tanning, dye, finishing, impregnation and care products PC 24 : Lubricants, greases, release products PC 31 : Polishes and wax blends	N/A	N/A	AC 1 : Vehicles AC 7 : Metal articles AC 8 : Paper articles AC 10 : Rubber articles AC 11 : Wood articles AC 13 : Plastic articles	N/A
IU number 2 : Use in	N/A	ERC 8a : Wide dispersive indoor	N/A	PC 3 : Air care products	N/A	YES	AC 0 : Other	N/A

cleaning agents		use of processing aids in open systems ERC 8d : Wide dispersive outdoor use of processing aids in open systems		PC 4 : Anti-freeze and de-icing products PC 9a : Coatings and paints, thinners, paint removes PC 9b : Fillers, putties, plasters, modelling clay PC 24 : Lubricants, greases, release products PC 35 : Washing and cleaning products (including solvent based products)			Cleanin g agents	
IU number 3 : Use in lubricants	N/A	ERC 8a : Wide dispersive indoor use of processing aids in open systems ERC 8d : Wide dispersive outdoor use of processing aids in open systems ERC 9a : Wide dispersive indoor use of substances in closed systems ERC 9b : Wide dispersive outdoor use of substances in closed systems	N/A	PC 1 : Adhesives, Sealants PC 24 : Lubricants, greases, release products PC 31 : Polishes and wax blends	N/A	N/A	AC 0 : Other Lubrica nts	N/A
IU number 4 : Use in propellants	N/A	ERC 8a : Wide dispersive indoor use of processing aids in open systems ERC 8d : Wide dispersive outdoor use of processing aids in open systems	N/A	PC 1 : Adhesives, Sealants PC 3 : Air care products PC 4 : Anti-freeze and de-icing products PC 9a : Coatings and paints, thinners, paint removes	N/A	N/A	AC 0 : Other Propella nts	N/A

				PC 9b : Fillers, putties, plasters, modelling clay PC 24 : Lubricants, greases, release products PC 31 : Polishes and wax blends PC 35 : Washing and cleaning products (including solvent based products)				
IU number 5 : Use as fuel	N/A	ERC 8b : Wide dispersive indoor use of reactive substances in open systems ERC 8e : Wide dispersive outdoor use of reactive substances in open systems	N/A	PC 13 : Fuels	N/A	YES	AC 0 : Other Fuels	N/A
IU number 6 : Use in functional fluids	N/A	ERC 9a : Wide dispersive indoor use of substances in closed systems ERC 9b : Wide dispersive outdoor use of substances in closed systems	N/A	PC 16 : Heat transfer fluids PC 17 : Hydraulic fluids	N/A	N/A	AC 0 : Other Functional fluids	N/A
IU number 7 : Use in de-icing and anti-icing applications	N/A	ERC 8d : Wide dispersive outdoor use of processing aids in open systems	N/A	PC 4 : Anti-freeze and de-icing products	N/A	N/A	AC 0 : Other De-icing and anti-icing products	N/A
IU number 8 : Use in personal care products,	N/A	ERC 8a : Wide dispersive indoor use of processing aids in open systems ERC 8d : Wide	N/A	PC 28 : Perfumes, fragrances PC 39 : Cosmetics, personal care products	N/A	N/A	AC 0 : Other Personal care products	N/A

perfumes		dispersive outdoor use of processing aids in open systems					perfumes	
IU number 9 : Use in water treatment chemicals	N/A	ERC 8b : Wide dispersive indoor use of reactive substances in open systems ERC 8e : Wide dispersive outdoor use of reactive substances in open systems	N/A	PC 36 : Water softeners PC 37 : Water treatment chemicals	N/A	N/A	AC 0 : Other Water treatment chemicals	N/A
IU number 10 : De-acidification/neutralisation agent	N/A	ERC 8a : Wide dispersive indoor use of processing aids in open systems ERC 8e : Wide dispersive outdoor use of reactive substances in open systems	N/A	PC 36 : Water softeners PC 37 : Water treatment chemicals	N/A	YES	N/A	N/A
IU number 11 : Use in agrochemicals/slurry and fertiliser products	N/A	ERC 2 : Formulation of preparations ERC 8a : Wide dispersive indoor use of processing aids in open systems ERC 8d : Wide dispersive outdoor use of processing aids in open systems	N/A	N/A	N/A	YES	N/A	N/A
IU number 12 : Use as water treatment chemical	N/A	ERC 8a : Wide dispersive indoor use of processing aids in open systems ERC 8d : Wide dispersive outdoor use of processing aids	N/A	PC 1 : Adhesives, Sealants PC 4 : Anti-freeze and de-icing products PC 24 : Lubricants, greases, release	N/A	NO	N/A	N/A

		in open systems ERC 9a : Wide dispersive indoor use of substances in closed systems		products				
IU number 13 : Use as flame retardant	N/A	ERC 8a : Wide dispersive indoor use of processing aids in open systems ERC 8b : Wide dispersive indoor use of reactive substances in open systems ERC 8c : Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC 8d : Wide dispersive outdoor use of processing aids in open systems ERC 8f : Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC 9a : Wide dispersive indoor use of substances in closed systems ERC 9b : Wide dispersive outdoor use of substances in closed systems 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	N/A	PC 0 : Other: Fire extinguishers and propellants PC 1 : Adhesives, Sealants PC 3 : Air care products PC 4 : Anti-freeze and de-icing products PC 9a : Coatings and paints, thinners, paint removes PC 9b : Fillers, putties, plasters, modelling clay PC 16 : Heat transfer fluids PC 17 : Hydraulic fluids PC 18 : Ink and toners PC 23 : Leather tanning, dye, finishing, impregnation and care products PC 24 : Lubricants, greases, release products PC 26 : Paper and board dye, finishing and impregnation products; including bleaches and other processing aids PC 28 : Perfumes, fragrances PC 31 : Polishes and wax blends PC 32 : Polymer	N/A	YES	AC 0 : Other Fire extinguishers AC 1 : Vehicles	N/A

		materials with low release		preparations and compounds PC 34 : Textile dyes, finishing and impregnating products; including bleaches and other processing aids PC 35 : Washing and cleaning products (including solvent based products) PC 39 : Cosmetics, personal care products				
IU number 14 : Use in hydraulic fluids	N/A	ERC 8a : Wide dispersive indoor use of processing aids in open systems ERC 8d : Wide dispersive outdoor use of processing aids in open systems ERC 9a : Wide dispersive indoor use of substances in closed systems	N/A	PC 16 : Heat transfer fluids PC 17 : Hydraulic fluids	N/A	YES	N/A	N/A
IU number 15 : Use in coating, inks, paints and roofing	N/A	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	N/A	PC 1 : Adhesives, Sealants PC 4 : Anti-freeze and de-icing products PC 9a : Coatings and paints, thinners, paint removes PC 9b : Fillers, putties, plasters, modelling clay PC 18 : Ink and toners PC 23 : Leather tanning, dye, finishing, impregnation and	N/A	NO	AC 1 : Vehicles AC 7 : Metal articles AC 8 : Paper articles AC 10 : Rubber articles AC 11 : Wood articles AC 13 : Plastic articles	N/A

				care products PC 24 : Lubricants, greases, release products PC 31 : Polishes and wax blends				
IU number 16 : Use in cleaning agents	N/A	ERC 8a : Wide dispersive indoor use of processing aids in open systems ERC 8d : Wide dispersive outdoor use of processing aids in open systems ERC 9a : Wide dispersive indoor use of substances in closed systems ERC 9b : Wide dispersive outdoor use of substances in closed systems	N/A	PC 1 : Adhesives, Sealants PC 24 : Lubricants, greases, release products PC 31 : Polishes and wax blends	N/A	YES	AC 0 : Other lubricants	N/A
IU number 17 : Use in personal care products	N/A	ERC 8a : Wide dispersive indoor use of processing aids in open systems ERC 8d : Wide dispersive outdoor use of processing aids in open systems	N/A	PC 28 : Perfumes, fragrances PC 39 : Cosmetics, personal care products	N/A	YES	AC 0 : Other personal care products , perfumes	N/A
IU number 18 : Use of function modified packaging	N/A	ERC 9a : Wide dispersive indoor use of substances in closed systems	N/A	PC 20 : Products such as ph- regulators, flocclulants, precipitants, neutralisation agents	N/A	YES	AC 0 : Other device for biologic al measure ment	N/A

1.3 Details of the supplier of the safety data sheet

Company name: SINWON CHEMICAL CO.,LTD.
Address: 1Ra-106, Shihwa Industrial Complex, #1236-5, Jungwang-Dong, Shihung-City, Kyonggi-Do, Korea
Contact Telephone: +82-31--432-6688
Fax: -
Email Address: -
Emergency Telephone: +82-31--432-6688

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance

Classification:

Magnesium hydroxide is not classified according to Regulation (EU) 453/2010 (REACH), Annex II.

2.2 Label elements

Labelling : Not classified

Signal word : Not classified

Hazard statement : Not classified

- Additional precautionary statements : Not classified.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	Conc ⁿ / %	CAS #	EC #	Classification
Magnesium hydroxide	≥ 96	1309-42-8	215-170-3	See section 2

4. FIRST AID MEASURES

4.1 Description of first aid measures

- After skin contact: - In case of contact with substance, immediately flush eyes with running water at least 20 minutes.
- Get immediate medical advice/attention.
- After eye contact: - In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Remove and isolate contaminated clothing and shoes.
- Wash contaminated clothing and shoes before reuse.
- Get immediate medical advice/attention.
- After ingestion: - Specific medical treatment is urgent.
- Move victim to fresh air.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- After inhalation: - Do not let him/her eat anything, if unconscious.
- Get immediate medical advice/attention.

4.2 Most important symptoms and effects

- Acute effects: None known.
- Delayed effects: No delayed effects are anticipated if first aid treatment is applied and is effective.

4.3 Indication of immediate medical attention and notes for physician

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
-

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Extinguishing media:

- Suitable extinguishing media:
 - Small Fire: dry sand, dry chemical, alcohol-resistant foam, water spray, regular foam, CO₂
 - Large Fire: water spray/fog, regular foam
- Unsuitable extinguishing media: High pressure water streams

5.2 Special hazards arising from the substance or mixture

- May be ignited by heat, sparks or flames.
- Containers may explode when heated.
- Some of these materials may burn, but none ignite readily.
- Fire will produce irritating and/or toxic gases.
- If inhaled, may be harmful.
- Some liquids produce vapors that may cause dizziness or suffocation.

5.3 Advice for firefighters

- Move containers from fire area if you can do it without risk.
 - Runoff from fire control may cause pollution.
 - Contact with substance may cause severe burns to skin and eyes.
 - Dike fire-control water for later disposal; do not scatter the material.
 - Fire involving Tanks; Cool containers with flooding quantities of water until well after fire is out.
 - Fire involving Tanks; Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
 - Fire involving Tanks; Always stay away from tanks engulfed in fire.
-

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

- Eliminate all ignition sources.
- Stop leak if you can do it without risk.
- Please note that materials and conditions to avoid .
- Ventilate the area.
- Do not touch or walk through spilled material.
- Prevent dust cloud.

6.2 Environmental precautions

- Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and material for containment and cleaning up

- Small Spill; Flush area with flooding quantities of water.
 - Small Spill; Take up with sand or other non-combustible absorbent material and place into containers for later disposal.
 - Large Spill; Dike far ahead of liquid spill for later disposal.
 - With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.
 - Powder Spill; Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.
-

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

- Please note that materials and conditions to avoid.
- Wash thoroughly after handling.
- Please work with reference to engineering controls and personal protective equipment.
- Be careful to high temperature.

7.2 Conditions for safe storage, including any incompatibilities

- Store in a closed container.
- Store in cool and dry place.
- Please note that materials and conditions to avoid.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 Control parameters

Exposure limits / standards:

Specific exposure limits have not been established or are not applicable unless listed below.

- Regulation in Korean: Not available
- US (NIOSH/OSHA/AGGIH): Not available
- EU Regulation: Not available
- Other: Not available
- Biological Exposure Index: Not available

Occupational exposure controls :

Exposure route of relevance	DNELs, DMELs, PNECs											
	Industrial				Professional				Consumer			
	Long term, local effects	Long term, systemic effects	Short term, local effects	Short term, systemic effect	Long term, local effects	Long term, systemic effects	Short term, local effects	Short term, systemic effects	Long term, local effects	Long term, systemic effects	Short term, local effects	Short term, systemic effects
Human: oral	-	-	-	-	-	-	-	-	-	10 mg/kg bw/day	-	10 mg/kg bw/day
Human: inhalation	-	117.54 mg/m ³	-	117.54 mg/m ³	-	117.54 mg/m ³	-	117.54 mg/m ³	-	34.78 mg/m ³	-	34.78 mg/m ³
Human: dermal	-	16.67 mg/kg bw/day	-	16.67 mg/kg bw/day	-	16.67 mg/kg bw/day	-	16.67 mg/kg bw/day	-	10 mg/kg bw/day	-	10 mg/kg bw/day
Environment: water	0.1 mg/L (freshwater), 0.01 mg/L (marine water), 1 mg/L (intermittent releases)											
Environment: air	-											
Environment: soil	0.01912 mg/kg soil dw											
Environment: sediment	0.08188 mg/kg sediment dw (freshwater), 0.008188 mg/kg sediment dw (marine water)											

Environment: STP	1 mg/L
Environment: oral	66.67 mg/kg food

8.2 Exposure controls

Appropriate engineering controls :

- Facilities for storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Individual protection measures, such as personal protective equipment :

Respiratory protection:

- Breathing protection if dusts are formed. Particle filter with low efficiency for solid particles (e.g. EN 143 or 149, Type P1 or FFP1).
- Respiratory protection: Wear NIOSH/MESA approved full or half face piece (with goggles) respiratory protective equipment.

Eye protection:

- Wear breathable safety goggles to protect from particulate material causing eye irritation or other disorder.
- An eye wash unit and safety shower station should be available nearby work place.

Hand protection:

- Wear appropriate protective gloves by considering physical and chemical properties of chemicals.

Body protection:

- Wear appropriate protective clothing by considering physical and chemical properties of chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance

Description :	Solid (powder)
Color :	White
Odor :	Odourless
Odor threshold :	Not available
pH :	9.5 ~ 10.5 (aqueous slurry)
Melting point/freezing point :	Not available
Initial boiling point and boiling range :	Not available
Flash point :	Not available
Evaporation rate :	Not available
Flammability (solid, gas) :	Non flammable (EU Method A.10, GLP)
Upper/lower flammability or explosive limits :	Not available
Vapor pressure :	Not available
Solubility (ies) :	1.78 mg/L (20 °C)(OECD TG 105, GLP)
Vapor density :	Not available
Specific gravity :	2.41 g/m ³ (20 °C)(OECD TG 109, GLP)(density)
Partition coefficient: n-octanol/water :	Not available
Auto ignition temperature :	Not self-ignitable(in 20 °C ~400 °C)
Decomposition temperature :	> 320 °C (OECD TG 102, GLP)
Viscosity :	Not available
Molecular weight :	58.32

10. STABILITY AND REACTIVITY

10.1 Reactivity/Chemical stability/Possibility of hazardous reactions

- Containers may explode when heated.
- Some of these materials may burn, but none ignite readily.
- Fire may produce irritating and/or toxic gases.
- Non-combustible, substance itself does not burn but may decompose upon heating, then produce corrosive and/or toxic fumes..

10.2 Conditions to avoid

- Ignition sources (heat, sparks or flames)

10.3 Incompatible materials

- Combustibles, reducing agents

10.4 Hazardous decomposition products

- Corrosive and/or toxic fume
- Irritating, corrosive and/or toxic gases

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects	
(a) Acute toxicity;	<u>Conclusion / Remarks</u>
By oral route	Rat, LD50 > 2000 mg/kg (female)(OECD TG 423, GLP)
By dermal route	Not available
By inhalation route	Rat, LC50 > 2.1 mg/L 4 hr (male/female)(OECD TG 403, GLP)
(b) Skin corrosion/irritation;	Based on results of in vitro test with human skin model, it is concluded that magnesium hydroxide is non-irritant. (GLP)
(c) Serious eye damage/irritation;	In eye irritation test with rabbits, irritations were not observed.(OECD TG 405, GLP)
(d) Respiratory or skin sensitization;	In Guinea pig maximisation test, magnesium chloride hexahydrate caused no reactions identified as sensitising at the tested concentration.(OECD Guideline 406, GLP)
(e) Germ cell mutagenicity;	Negative reactions were observed in vitro (mammalian chromosome aberration test (OECD TG 473, GLP), bacterial reverse mutation assay (OECD TG 471, GLP), mammalian cell gene mutation assay (OECD TG 476, GLP)).
(f) Carcinogenicity;	KOREA-ISHL, IARC, NTP, OSHA, ACGIH, EU Regulation 1272/2008: Not listed
(g) Reproductive toxicity;	In reproduction/developmental toxicity test with rats, no reproduction/developmental toxicity were observed at any dose level.(OECD TG 422, GLP)
(h) STOT-single exposure;	In acute inhalation toxicity study with rats, no clinical signs were noted during exposure. After exposure, ptosis and/or piloerection were noted in two males and one female on day 1 only. (OECD TG 403, GLP)
(i) STOT-repeated exposure;	No toxicologically relevant changes were noted in repeated dose oral toxicity study with rats. NOAEL \geq 1000 mg/kg bw/day (OECD TG 422, GLP)
(j) Aspiration hazard.	Not available

12. ECOLOGICAL INFORMATION

	<u>Conclusion / Remarks</u>
12.1 Toxicity	
Acute toxicity	Fish : 96hr-LC50 (<i>Pimephales promelas</i>) = 511.31 mg/L Invertebrates : 48h- LC50 (<i>Daphnia magna</i>) = 284.76 mg/L Algae : 72hr-EC50 (other) > 100 mg/L (OECD TG 201, GLP)
Chronic toxicity	Not available
12.2 Persistence and degradability	Not available
12.3 Bioaccumulative potential	Not available
12.4 Mobility in soil	Not available
12.5 Results of PBT and vPvB assessment	Not available
12.6 Other adverse effects	Not available

13. DISPOSAL CONSIDERATIONS

Waste from residues

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Container

Consider the required attentions in accordance with waste treatment management regulation.

14. TRANSPORT INFORMATION

UN #:	Not classified with a dangerous goods
Class:	Not applicable
Proper shipping name:	Not applicable
Packing group:	Not applicable
Marine pollutant	Not applicable
Other information:	Not applicable

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulation/legislation specific for the substance or mixture

EU Regulatory Information

- **EU classification**
 - Annex I of Directive 67/548/EEC:
 - Classification: Not classified
 - Risk phrases: Not applicable

- Safety phrases: Not applicable
- EU CLP 1272/2008:
 - Classification: Not classified
 - Hazard statement codes: Not applicable
 - Precautionary statement codes: Not applicable
- EU SVHC list : Not regulated
- EU Authorisation List : Not regulated
- EU Restriction list : Not regulated

Foreign Regulatory Information

o External information

- U.S.A management information (OSHA Regulation) : Not regulated
- U.S.A management information (CERCLA Regulation) : Not regulated
- U.S.A management information (EPCRA 302 Regulation) : Not regulated
- U.S.A management information (EPCRA 304 Regulation) : Not regulated
- U.S.A management information (EPCRA 313 Regulation) : Not regulated
- Substance of Roterdame Protocol : Not regulated
- Substance of Stockholme Protocol : Not regulated
- Substance of Montreal Protocol : Not regulated

Foreign Inventory Status

- Korea management information : Existing Chemicals Inventory (KECI/KECL): Existing Chemical Substance: (KE-04487)
- U.S.A management information : Section 8(b) Inventory (TSCA): present
- Japan management information : Existing and New Chemical Substances (ENCS): (1)-386
- China management information : Inventory of Existing Chemical Substances (IECSC):present
- Canada management information : Domestic Substances List (DSL): present
- Australia management information : Inventory of Chemical Substances (AICS): present
- New Zealand management : Inventory of Chemicals (NZIoC): present
- Philippines management information : Inventory of Chemicals and Chemical Substances (PICCS): present

15.2 Chemical safety assessment : In accordance with REACH Article 14, a Chemical Safety Assessment has been carried out for this substance.

16. OTHER INFORMATION

16.1 Indication of changes :

Version : -
Revision date : -

16.2 Key literature reference and sources for data :

- U.S. National library of Medicine (NLM) Hazardous Substances Data Bank (HSDB) ; <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB.htm>
- REACH information on registered substances; <http://apps.echa.europa.eu/registered/registered-sub.aspx>
- Korea Occupational Health & Safety Agency; <http://www.kosha.net>

- National Chemicals Information System; <http://ncis.nier.go.kr/ncis/>
- National Emergency Management Agency-Korea dangerous material inventory management system; <http://www.nema.go.kr/hazmat/main/main.jsp>
- Waste Control Act enforcement regulation attached [1]

Product safety data sheet for Magnesium Hydroxide prepared in accordance with Regulation (EU) 453/2010 (REACH), Annex II.

This safety data sheet (SDS) is based on the legal provisions of the REACH Regulation, as amended. Its contents are intended as a guide to the appropriate precautionary handling of the material. It is the responsibility of recipients of this SDS to ensure that the information contained therein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. Information and instructions provided in this SDS are based on the current state of scientific and technical knowledge at the date of issue indicated. It should not be construed as any guarantee of technical performance, suitability for particular applications, and does not establish a legally valid contractual relationship. This version of the SDS supersedes all previous versions.
