Safety data sheet
according to Regulation (EC) No 1907/2006, Article 31

Printing date 25.03.2026 Version number 39 (replaces version 38) Revision: 25.03.2026

SECTION 1: Identification of the substance/mixture and of the company/undertaking

· **1.1 Product identifier**
· **Trade name: n-Pentane**
· **SDS number:** CH0030
· **CAS Number:**
109-66-0

· **EC number:**
203-692-4
· **Index number:**
601-006-00-1
· **Registration number** 01-2119459286-30
· **1.2 Relevant identified uses of the substance or mixture and uses advised against**
For professional users only
· **Life cycle stages**
IS Use at industrial Sites
F Formulation or re-packing
· **Sector of Use**
SU8 Manufacture of bulk, large scale chemicals (including petroleum products)
SU9 Manufacture of fine chemicals
SU21 Consumer uses: Private households / general public / consumers
SU22 Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
SU24 Scientific research and development
· **Product category**
PC1 Adhesives, sealants
PC4 Anti-Freeze and de-icing products
PC8 Biocidal products
PC9a Coatings and paints, thinners, paint removers
PC9b Fillers, putties, plasters, modelling clay
PC9c Finger paints
PC15 Non-metal-surface treatment products
PC18 Ink and toners
PC23 Leather treatment products
PC24 Lubricants, greases, release products
PC31 Polishes and wax blends
PC34 Textile dyes, and impregnating products
PC3 Air care products
PC35 Washing and cleaning products (including solvent based products)
PC38 Welding and soldering products, flux products
PC28 Perfumes, fragrances
PC13 Fuels
PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents
PC21 Laboratory chemicals
PC29 Pharmaceuticals
PC40 Extraction agents
· **Process category**
PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4 Chemical production where opportunity for exposure arises
PROC5 Mixing or blending in batch processes
PROC7 Industrial spraying
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

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PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC10 Roller application or brushing
PROC11 Non industrial spraying
PROC12 Use of blowing agents in manufacture of foam
PROC13 Treatment of articles by dipping and pouring
PROC14 Tabletting, compression, extrusion, pelletisation, granulation
PROC15 Use as laboratory reagent
PROC16 Use of fuels
PROC20 Use of functional fluids in small devices

· ***Environmental release category***
ERC1 Manufacture of the substance
ERC2 Formulation into mixture
ERC3 Formulation into solid matrix
ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5 Use at industrial site leading to inclusion into/onto article
ERC6a Use of an intermediary
ERC6b Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC6c Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC6d Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC7 Use of functional fluid at industrial site
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ERC9a Widespread use of functional fluid (indoor)
ERC9b Widespread use of functional fluid (outdoor)

· ***Application of the substance / the mixture*** *Chemicals products for laboratory*

· ***1.3 Details of the supplier of the safety data sheet***
· ***Manufacturer/Supplier:***
CARLO ERBA REAGENTS
Chaussée du Vexin
Parc d'Affaires des Portes - BP616
27106 VAL DE REUIL Cedex
Téléphone: +33 (0)2 32 09 20 00
Télécopie: +33 (0)2 32 09 20 20
· ***Further information obtainable from:***
Q.A / Normative
email: MSDS_CER-SDS@cer.dgroup.it
· ***1.4 Emergency telephone number:***
Ireland - Tel : 00 353 1 8092568 - 00 353 1 8379964 (24h/24)
EU Tel : 112

SECTION 2: Hazards identification

· ***2.1 Classification of the substance or mixture***
· ***Classification according to Regulation (EC) No 1272/2008***



GHS02 flame

Flam. Liq. 2 *H225 Highly flammable liquid and vapour.*

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GHS08 health hazard

Asp. Tox. 1 *H304 May be fatal if swallowed and enters airways.*



GHS09 environment

Aquatic Chronic 2 *H411 Toxic to aquatic life with long lasting effects.*



GHS07

STOT SE 3 *H336 May cause drowsiness or dizziness.*

· ***2.2 Label elements***
· ***Labelling according to Regulation (EC) No 1272/2008***
The substance is classified and labelled according to the CLP regulation.
· ***Hazard pictograms***



GHS02 GHS07 GHS08 GHS09

· ***Signal word*** *Danger*
· ***Hazard statements***
H225 Highly flammable liquid and vapour.
H336 May cause drowsiness or dizziness.
H304 May be fatal if swallowed and enters airways.
H411 Toxic to aquatic life with long lasting effects.
· ***Precautionary statements***

P210	*Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.*
P241	*Use explosion-proof [electrical/ventilating/lighting] equipment.*
P280	*Wear protective gloves / eye protection / face protection.*
P303+P361+P353	*IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].*
P304+P340	*IF INHALED: Remove person to fresh air and keep comfortable for breathing.*
P403+P233	*Store in a well-ventilated place. Keep container tightly closed.*

· ***Additional information:***
EUH066 Repeated exposure may cause skin dryness or cracking.
· ***2.3 Other hazards***
· ***Results of PBT and vPvB assessment***
· ***PBT:*** *Not applicable*
· ***vPvB:*** *Not applicable*
· ***Determination of endocrine-disrupting properties*** *Not applicable*

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SECTION 3: Composition/information on ingredients

· **3.1 Substances**

· **CAS No. Description**
CAS: 109-66-0 n-Pentane

· **Identification number(s)**

· **EC number:** 203-692-4

· **Index number:** 601-006-00-1

SECTION 4: First aid measures

· **4.1 Description of first aid measures**
· **After inhalation:** Supply fresh air; consult a doctor in case of complaints.
· **After skin contact:**
Immediately wash with water and soap and rinse thoroughly. Wash contaminated clothing before reuse.
Generally the product does not irritate the skin.
If skin irritation continues, consult a doctor.
· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** Call a doctor immediately.
· **Information for doctor:** Show the doctor this Material Safety Data Sheet.
· **4.2 Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **4.3 Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

SECTION 5: Firefighting measures

· **5.1 Extinguishing media**
· **Suitable extinguishing agents:** CO2 or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet.
· **5.2 Special hazards arising from the substance or mixture**
During heating or in case of fire poisonous gases are produced.
In lack of oxygen: carbon monoxide (CO)
Carbon monoxide and carbon dioxide
· **5.3 Advice for firefighters**
· **Protective equipment:** Do not inhale gases in case or fire or combustion.
· **Additional information** Keep receptacles cool with water spray.

SECTION 6: Accidental release measures

· **6.1 Personal precautions, protective equipment and emergency procedures**
Keep away any ignition source.
Wear protective equipment. Keep unprotected persons away.
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
Ensure adequate ventilation
· **6.2 Environmental precautions:**
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to penetrate the ground/soil.
Do not allow product to reach sewage system or any water course.

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Prevent seepage into sewage system, workpits and cellars.
In case of seepage into the ground inform responsible authorities.
· ***6.3 Methods and material for containment and cleaning up:***
Collect the liquid with vacuum in a suitable container and absorb the remainder with a porous material (diatomite, acid binders, universal binders, etc).
Ensure adequate ventilation.
Dispose contaminated material as waste according to section 13.
· ***6.4 Reference to other sections***
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

· ***7.1 Precautions for safe handling***
Store in cool, dry place in tightly closed receptacles.
Ensure good ventilation/exhaustion at the workplace.
Only handle and refill product in closed systems or under local exhaust.
Wear suitable respiratory protective device when decanting larger quantities without extractor facilities.
Pneumatic conveyance only with nitrogen or other inert gases.
· ***Information about fire - and explosion protection:***



Keep ignition sources away - Do not smoke.

Protect against electrostatic charges.

· ***7.2 Conditions for safe storage, including any incompatibilities***
· ***Storage:***
· ***Requirements to be met by storerooms and receptacles:***
Store in a cool location.
Prevent any seepage into the ground.
Use only receptacles specifically permitted for this substance/product.
· ***Information about storage in one common storage facility:*** *Not required*
· ***Further information about storage conditions:***
Do not seal thin-walled receptacle gas tight.
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· ***7.3 Specific end use(s)*** *No further relevant information available.*

SECTION 8: Exposure controls/personal protection

· ***8.1 Control parameters***

· ***Ingredients with limit values that require monitoring at the workplace:***	
CAS: 109-66-0 n-Pentane	
IOELV	*Long-term value: 3000 mg/m³, 1000 ppm*

· ***DNELs***		
Dermal	*DNEL (workers-systemic chronic effects)*	*432 mg/kg*
Inhalative	*DNEL (workers-systemic chronic effects)*	*3,000 mg/m3*

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· **PNECs**	
PNEC (Fresh water)	0.23 mg/l
PNEC (Freshwater sediment)	1.2 mg/kg
PNEC (Marine water)	0.23 mg/l
PNEC (Seawater sediment)	1.2 mg/l
PNEC (STP)	3.6 mg/l
PNEC (Soil)	0.55 mg/kg

· ***Additional information:*** *The lists valid during the making were used as basis.*

· ***8.2 Exposure controls***
· ***Appropriate engineering controls*** *No further data; see section 7.*
· ***Individual protection measures, such as personal protective equipment***
· ***General protective and hygienic measures:***
The usual precautionary measures are to be adhered to when handling chemicals.
Keep away from foodstuffs, beverages and feed.
Avoid contact with the eyes and skin.
· ***Respiratory protection:***
Use suitable respiratory protective device only when aerosol or mist is formed.



In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.

Filter P2
The selected respiratory protection must comply with standard EN 136/140/143/145/149.
· ***Hand protection***
The selected protective gloves have to satisfy the specifications of REGULATION (EU) 2016/425 and the standard EN 374 derived from it.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation



Protective gloves

Rubber gloves
· ***Material of gloves***
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
Fluorocarbon rubber (Viton)
Recommended thickness of the material: ≥ 0.4 mm
Nitrile rubber, NBR
· ***Penetration time of glove material***
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· ***Not suitable are gloves made of the following materials:***
Natural rubber, NR
Chloroprene rubber, CR
Butyl rubber, BR
PVC gloves

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· **Eye/face protection**



Safety glasses

· **Environmental exposure controls**
The product must not be released into the environment.
In case of unintended release of the product: See section 6 of the Safety Data Sheet.
· **Risk management measures** *Keep good industrial hygiene.*

SECTION 9: Physical and chemical properties

· **9.1 Information on basic physical and chemical properties**	
· **Molecular weight**	72.15 g
· **Physical state**	Liquid
· **Colour:**	Colourless
· **Odour:**	Weak, characteristic
· **Odour threshold:**	Not determined
· **Melting point/freezing point:**	-129.7 °C
· **Boiling point or initial boiling point and boiling range**	36 °C
· **Flammability**	Not applicable
· **Lower and upper explosion limit**	
· **Lower:**	1.4 Vol %
· **Upper:**	7.8 Vol %
· **Flash point:**	-40 °C
· **Auto-ignition temperature:**	260 °C
· **Decomposition temperature:**	Not determined
· **pH**	Not determined
· **Viscosity:**	
· **Kinematic viscosity**	Not determined
· **Dynamic at 20 °C:**	0.224 mPas
· **Solubility**	
· **water at 20 °C:**	0.01 g/l
· **organic solvents:**	Soluble in many organic solvents.
· **Partition coefficient n-octanol/water (log value)**	0.5302
· **Vapour pressure at 20 °C:**	573 hPa
· **Vapour pressure at 50 °C:**	1,590 hPa
· **Density and/or relative density**	
· **Density at 20 °C:**	0.62624 g/cm³
· **Relative density**	Not determined
· **Vapour density**	Not determined

· **9.2 Other information**	
· **Appearance:**	
· **Form:**	Fluid
· **Important information on protection of health and environment, and on safety.**	
· **Ignition temperature:**	Not determined
· **Explosive properties:**	Product is not explosive. However, formation of explosive air/vapour mixtures are possible.
· **Molecular formula**	C5 H12
· **Molecular weight**	72.15 g/mol

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· **Change in condition**	
· **Evaporation rate**	Not determined

· **Information with regard to physical hazard classes**	
· **Explosives**	Void
· **Flammable gases**	Void
· **Aerosols**	Void
· **Oxidising gases**	Void
· **Gases under pressure**	Void
· **Flammable liquids**	Highly flammable liquid and vapour.
· **Flammable solids**	Void
· **Self-reactive substances and mixtures**	Void
· **Pyrophoric liquids**	Void
· **Pyrophoric solids**	Void
· **Self-heating substances and mixtures**	Void
· **Substances and mixtures, which emit flammable gases in contact with water**	Void
· **Oxidising liquids**	Void
· **Oxidising solids**	Void
· **Organic peroxides**	Void
· **Corrosive to metals**	Void
· **Desensitised explosives**	Void

SECTION 10: Stability and reactivity

· **10.1 Reactivity** See 10.3
· **10.2 Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used and stored according to specifications.
· **10.3 Possibility of hazardous reactions**
Can react violently with oxygen rich (oxidizing) material. Danger of Explosion.
· **10.4 Conditions to avoid**
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
· **10.5 Incompatible materials:** No further relevant information available.
· **10.6 Hazardous decomposition products:** Carbon monoxide, Carbon dioxide.

SECTION 11: Toxicological information

· **11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**
· **Acute toxicity** Based on available data, the classification criteria are not met.

· **LD/LC50 values relevant for classification:**		
Inhalative	LC50/4 h	364 mg/L (rat)

· **Primary irritant effect:**
· **Skin corrosion/irritation** Based on available data, the classification criteria are not met.
· **Serious eye damage/irritation** Based on available data, the classification criteria are not met.
· **Ingestion:** It can be harmfull if swallowed.
· **Inhalation:** May be harmful if inhaled. May cause respiratory tract irritation.
· **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
· **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
· **Carcinogenicity** Based on available data, the classification criteria are not met.
· **Reproductive toxicity** Based on available data, the classification criteria are not met.
· **STOT-single exposure** May cause drowsiness or dizziness.

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· ***STOT-repeated exposure*** *Based on available data, the classification criteria are not met.*
· ***Aspiration hazard*** *May be fatal if swallowed and enters airways.*
· ***Other information (about experimental toxicology):*** *No further relevant information available.*
· ***11.2 Information on other hazards***
· ***Endocrine disrupting properties*** *Substance is not listed.*

SECTION 12: Ecological information

· ***12.1 Toxicity***
· ***Aquatic toxicity:*** *No further relevant information available.*
· ***12.2 Persistence and degradability*** *No further relevant information available.*
· ***Method***
· ***Ecological information*** *Not available*
· ***12.3 Bioaccumulative potential*** *No further relevant information available.*
· ***12.4 Mobility in soil*** *No further relevant information available.*
· ***12.5 Results of PBT and vPvB assessment***
· ***PBT:*** *Not applicable*
· ***vPvB:*** *Not applicable*
· ***12.6 Endocrine disrupting properties***
The product does not contain substances with endocrine disrupting properties.
· ***12.7 Other adverse effects***
· ***Remark:*** *Toxic for fish*
· ***Additional ecological information:***
· ***General notes:***
Water hazard class 2 (German Regulation) (Assessment by list): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
Also poisonous for fish and plankton in water bodies.
Toxic for aquatic organisms

*
SECTION 13: Disposal considerations

· ***13.1 Waste treatment methods***
· ***Recommendation***
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
Reutilise if possible or contact a waste processors for recycling or safe disposal.
· ***Waste disposal key:***
The European Union does not establish uniform rules for the disposal of chemical waste, which are special waste. Their treatment and elimination of the domestic legislation of each country. So, in each case, you should contact the relevant authorities, or those companies legally authorized for elimination of waste.
2014/955/UE: Council Decision of 18 December 2014 amending the list of wastes contained in Decision 2000/532/EC.
Directive 2008/98/EC of the european parliament and of the council of 18 November 2008, in ist latest valid version.

· **European waste catalogue**	
07 00 00	*WASTES FROM ORGANIC CHEMICAL PROCESSES*
07 01 00	*wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals*
*07 01 04**	*other organic solvents, washing liquids and mother liquors*
HP3	*Flammable*
HP5	*Specific Target Organ Toxicity (STOT)/Aspiration Toxicity*
HP14	*Ecotoxic*

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· ***Uncleaned packaging:***
The containers and packaging materials contaminated with dangerous substances or preparations, have the same treatment of products.
Directive 94/62/EC of the European Parliament and the Council of 20 December 1994 on packaging and packaging waste.
· ***Recommendation:***
Disposal must be made according to official regulations.
Packagings that may not be cleansed are to be disposed of in the same manner as the product.

SECTION 14: Transport information

· ***14.1 UN number or ID number***	
· ***ADR/RID, IMDG, IATA***	*UN1265*
· ***14.2 UN proper shipping name***	
· ***ADR/RID***	*1265 PENTANES, ENVIRONMENTALLY HAZARDOUS*
· ***IMDG***	*PENTANES, MARINE POLLUTANT*
· ***IATA***	*Pentanes*
· ***14.3 Transport hazard class(es)***	
· ***ADR/RID***	



· ***Class***	*3 (F1) Flammable liquids.*
· ***Label***	*3*
· ***IMDG***	



· ***Class***	*3 Flammable liquids.*
· ***Label***	*3*
· ***IATA***	



· ***Class***	*3 Flammable liquids.*
· ***Label***	*3*
· ***14.4 Packing group***	
· ***ADR/RID, IMDG, IATA***	*II*
· ***14.5 Environmental hazards:***	*Environmentally hazardous substance, liquid; Marine Pollutant*
· ***Marine pollutant:***	*Symbol (fish and tree)*
· ***Special marking (ADR/RID):***	*Symbol (fish and tree)*
· ***14.6 Special precautions for user***	*Warning: Flammable liquids.*
· ***Hazard identification number (Kemler code):***	*33*

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· **EMS Number:**	F-E,S-D
· **Stowage Category**	E
· **14.7 Maritime transport in bulk according to IMO instruments**	Not applicable
· **Transport/Additional information:**	
· **ADR/RID**	
· **Excepted quantities (EQ):**	E2
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **Transport category**	2
· **Tunnel restriction code**	D/E
· **IMDG**	
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 1265 PENTANES, 3, II, ENVIRONMENTALLY HAZARDOUS

SECTION 15: Regulatory information

· **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **SARA Section 355 (extremely hazardous substances)** Substance is not listed.
· **SARA Section 313 (specific toxic chemical listings)** Substance is not listed.
· **Prop 65 - Chemicals known to cause cancer** Substance is not listed.

· **Directive 2012/18/EU**
· **Named dangerous substances - ANNEX I** Substance is not listed.
· **Seveso category**
E2 Hazardous to the Aquatic Environment
P5c FLAMMABLE LIQUIDS
· **Qualifying quantity (tonnes) for the application of lower-tier requirements** 200 t
· **Qualifying quantity (tonnes) for the application of upper-tier requirements** 500 t
· **REGULATION (EU) 2019/1021 on persistent organic pollutants (POP)** Substance is not listed.
· **LIST OF SUBSTANCES SUBJECT TO AUTHORISATION (ANNEX XIV)** Substance is not listed.
· **REGULATION (EC) No 1907/2006 ANNEX XVII** Conditions of restriction: 3, 40
· **DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment – Annex II**
Substance is not listed.
· **REGULATION (EU) 2024/590 on substances that deplete the ozone layer** Substance is not listed.
· **National regulations:**

· **Technical instructions (air):**

Class	Share in %
NK	50-100

· **Waterhazard class:** Water hazard class 2 (Assessment by list): hazardous for water.

· **Other regulations, limitations and prohibitive regulations**
· **Substances of very high concern (SVHC) according to REACH, Article 57** Substance is not listed.

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· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing SDS:** Q.A./Normative
· **Date of previous version:** 19.03.2021
· **Version number of previous version:** 38
· **Abbreviations and acronyms:**
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: International Civil Aviation Organisation
RCR : Risk Characterisation Ratio
ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
DNEL: Derived No-Effect Level (REACH)
PNEC: Predicted No-Effect Concentration (REACH)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
SVHC: Substances of Very High Concern
vPvB: very Persistent and very Bioaccumulative
ATE: Acute toxicity estimate values
Flam. Liq. 2: Flammable liquids – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
Asp. Tox. 1: Aspiration hazard – Category 1
Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2
· **Sources**
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006, REACH, in the latest valid version.
Regulation (EC) N° 1272/2008 of the European Parliament and of the Council of 16 December 2008, CLP, in the latest valid version.
Globally Harmonized System, GHS
ADR/RID, IMDG, IATA
PubChem : an open chemistry database at the National Institutes of Health (NIH)
ECHA : European CHemicals Agency
GESTIS : Information system on hazardous substances of the German Social Accident Insurance
· ***** Data compared to the previous version altered.** .

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Annex: Exposure scenario 1

· ***Short title of the exposure scenario*** *Chemicals products for laboratory*
· ***Sector of Use*** *Industrial use.*
· ***Process category***
PROC10 Roller application or brushing
PROC15 Use as laboratory reagent
· ***Environmental release category***
ERC2 Formulation into mixture
ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
· ***Description of the activities / processes covered in the Exposure Scenario***
See section 1 of the annex to the Safety Data Sheet.
· ***Conditions of use*** *Customary application according to section 1.*
· ***Duration and frequency*** *8hrs (full working shift).*
· ***Worker*** *8hrs (full working shift).*
· ***Physical parameters***
The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.
· ***Physical state*** *Fluid*
· ***Concentration of the substance in the mixture*** *Raw material.*
· ***Used amount per time or activity*** *0.1 tons per day*
· ***Other operational conditions*** *Observe the general safety regulations when handling chemicals.*
· ***Other operational conditions affecting environmental exposure*** *Use only on hard ground.*
· ***Other operational conditions affecting worker exposure***
Take precautionary measures against static discharge.
Keep away from sources of ignition - No smoking.
Indoor application.
Outdoor application.
· ***Risk management measures***
· ***Worker protection***
· ***Organisational protective measures***
Keep good industrial hygiene.
Ensure that activities are executed by specialists or authorised personnel only.
Ensure good ventilation. This can be achieved by using a local exhaustion or general exhaust system. If these measures are insufficient to keep the solvent vapour concentration below the workplace limit, wear an adequate respiratory protective device.
The appropriate type of chemical protective glove has to be selected specifically, depending on the concentration and quantity of hazardous substances in the workplace.
Provide sufficient washing facilities.
Work clothes must not consist of textiles that exhibit dangerous melting behaviour in case of fire.
· ***Technical protective measures***
Use product only in enclosed systems.
Ensure good ventilation/exhaustion at the workplace.
Provide explosion-proof electrical equipment.
· ***Personal protective measures***
The selected protective gloves have to satisfy the specifications of REGULATION (EU) 2016/425 and the standard EN 374 derived from it.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
Protective gloves
Rubber gloves
Safety glasses
The usual precautionary measures are to be adhered to when handling chemicals.

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Detailed measures on hand protection according to Safety Data Sheet, section 8.
Use suitable respiratory protective device only when aerosol or mist is formed.
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
Filter P2
The selected respiratory protection must comply with standard EN 136/140/143/145/149.

· ***Environmental protection measures***
Avoid release to the environment. Obtain special instructions / refer to Safety Data Sheet.
· ***Water*** *Do not allow to reach sewage system.*
· ***Soil*** *Prevent contamination of soil.*
· ***Notes*** *In case of unintended release of the product: See section 6 of the Safety Data Sheet.*
· ***Disposal measures*** *Ensure that waste is collected and contained.*
· ***Disposal procedures***
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
· ***Waste type*** *Partially emptied and uncleaned packaging*
· ***Exposure estimation***
· ***Worker (dermal)***
The calculated value is smaller than the DNEL.
The exposure estimation was carried out in accordance with ECETOC TRA.
· ***Worker (inhalation)***
The exposure estimation was carried out in accordance with ECETOC TRA.
The calculated value is smaller than the DNEL.
· ***Guidance for downstream users***
Whether the downstream user acts within the scope of the Exposure Scenario can be verified based on the information in sections 1 to 8.

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Annex: Exposure scenario 2

· ***Short title of the exposure scenario*** *Substance manufacturing*
· ***Sector of Use*** *Industrial use.*
· ***Process category***
PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4 Chemical production where opportunity for exposure arises
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC15 Use as laboratory reagent
· ***Environmental release category***
ERC1 Manufacture of the substance
ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
· ***Description of the activities / processes covered in the Exposure Scenario***
See section 1 of the annex to the Safety Data Sheet.
· ***Conditions of use*** *Customary application according to section 1.*
· ***Duration and frequency*** *8hrs (full working shift).*
· ***Worker*** *8hrs (full working shift).*
· ***Physical parameters***
The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.
· ***Physical state*** *Fluid*
· ***Concentration of the substance in the mixture*** *Raw material.*
· ***Used amount per time or activity*** *22000 tons per year*
· ***Other operational conditions*** *Observe the general safety regulations when handling chemicals.*
· ***Other operational conditions affecting environmental exposure*** *Use only on hard ground.*
· ***Other operational conditions affecting worker exposure***
Take precautionary measures against static discharge.
Keep away from sources of ignition - No smoking.
· ***Risk management measures***
· ***Worker protection***
· ***Organisational protective measures***
Keep good industrial hygiene.
Ensure that activities are executed by specialists or authorised personnel only.
Ensure good ventilation. This can be achieved by using a local exhaustion or general exhaust system. If these measures are insufficient to keep the solvent vapour concentration below the workplace limit, wear an adequate respiratory protective device.
The appropriate type of chemical protective glove has to be selected specifically, depending on the concentration and quantity of hazardous substances in the workplace.
Provide sufficient washing facilities.
Work clothes must not consist of textiles that exhibit dangerous melting behaviour in case of fire.
· ***Technical protective measures***
Use product only in enclosed systems.
Ensure good ventilation/exhaustion at the workplace.
Provide explosion-proof electrical equipment.
· ***Personal protective measures***
The selected protective gloves have to satisfy the specifications of REGULATION (EU) 2016/425 and the standard EN 374 derived from it.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

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Protective gloves
Rubber gloves
Avoid direct contact with the chemical/ the product/ the preparation by organisational measures.
Face protection
The usual precautionary measures are to be adhered to when handling chemicals.
Detailed measures on hand protection according to Safety Data Sheet, section 8.
Use suitable respiratory protective device only when aerosol or mist is formed.
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
Filter P2
The selected respiratory protection must comply with standard EN 136/140/143/145/149.
Protective work clothing
· ***Environmental protection measures***
Avoid release to the environment. Obtain special instructions / refer to Safety Data Sheet.
· ***Water*** *Do not allow to reach sewage system.*
· ***Soil*** *Prevent contamination of soil.*
· ***Notes*** *In case of unintended release of the product: See section 6 of the Safety Data Sheet.*
· ***Disposal measures*** *Ensure that waste is collected and contained.*
· ***Disposal procedures***
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
· ***Waste type*** *Partially emptied and uncleaned packaging*
· ***Exposure estimation***
· ***Worker (dermal)***
The calculated value is smaller than the DNEL.
The exposure estimation was carried out in accordance with ECETOC TRA.
· ***Worker (inhalation)***
The exposure estimation was carried out in accordance with ECETOC TRA.
The calculated value is smaller than the DNEL.
· ***Guidance for downstream users***
Whether the downstream user acts within the scope of the Exposure Scenario can be verified based on the information in sections 1 to 8.

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Annex: Exposure scenario 3

· **Short title of the exposure scenario** Formulation or re-packing
· **Sector of Use** Industrial use.
· **Description of the activities / processes covered in the Exposure Scenario**
See section 1 of the annex to the Safety Data Sheet.
· **Conditions of use** Customary application according to section 1.
· **Duration and frequency** Duration of exposure per year : 300 d
· **Worker** 8hrs (full working shift).
· **Physical parameters**
The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.
· **Physical state** Fluid
· **Concentration of the substance in the mixture** Raw material.
· **Other operational conditions** Observe the general safety regulations when handling chemicals.
· **Other operational conditions affecting environmental exposure** Use only on hard ground.
· **Other operational conditions affecting worker exposure**
Take precautionary measures against static discharge.
Keep away from sources of ignition - No smoking.
· **Risk management measures**
· **Worker protection**
· **Organisational protective measures**
Keep good industrial hygiene.
Ensure that activities are executed by specialists or authorised personnel only.
Ensure good ventilation. This can be achieved by using a local exhaustion or general exhaust system. If these measures are insufficient to keep the solvent vapour concentration below the workplace limit, wear an adequate respiratory protective device.
The appropriate type of chemical protective glove has to be selected specifically, depending on the concentration and quantity of hazardous substances in the workplace.
Provide sufficient washing facilities.
Work clothes must not consist of textiles that exhibit dangerous melting behaviour in case of fire.
· **Technical protective measures**
Use product only in enclosed systems.
Ensure good ventilation/exhaustion at the workplace.
Provide explosion-proof electrical equipment.
· **Personal protective measures**
The selected protective gloves have to satisfy the specifications of REGULATION (EU) 2016/425 and the standard EN 374 derived from it.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
Protective gloves
Rubber gloves
Avoid direct contact with the chemical/ the product/ the preparation by organisational measures.
Safety glasses
The usual precautionary measures are to be adhered to when handling chemicals.
Detailed measures on hand protection according to Safety Data Sheet, section 8.
Use suitable respiratory protective device only when aerosol or mist is formed.
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
Filter P2
The selected respiratory protection must comply with standard EN 136/140/143/145/149.
Protective work clothing
· **Environmental protection measures**
Avoid release to the environment. Obtain special instructions / refer to Safety Data Sheet.

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· ***Water*** *Do not allow to reach sewage system.*
· ***Soil*** *Prevent contamination of soil.*
· ***Notes*** *In case of unintended release of the product: See section 6 of the Safety Data Sheet.*
· ***Disposal measures*** *Ensure that waste is collected and contained.*
· ***Disposal procedures***
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
· ***Waste type*** *Partially emptied and uncleaned packaging*
· ***Exposure estimation***
· ***Worker (dermal)***
The calculated value is smaller than the DNEL.
The exposure estimation was carried out in accordance with ECETOC TRA.
· ***Worker (inhalation)***
The exposure estimation was carried out in accordance with ECETOC TRA.
The calculated value is smaller than the DNEL.
· ***Guidance for downstream users***
Whether the downstream user acts within the scope of the Exposure Scenario can be verified based on the information in sections 1 to 8.