

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Heraeus

Trinitratonitrosyl-Ru(II) sol. LSAMP

Version 6.0 Revision Date: 12.08.2019 Date of last issue: 12.08.2019
Date of first issue: 27.11.2015

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

1.1 Product identifier

Trade name : Trinitratonitrosyl-Ru(II) sol. LSAMP

Product code : 5100252

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

Use of the Sub-stance/Mixture : Industrial use, Catalyst

1.3 Details of the supplier of the safety data sheet

Company : Heraeus Deutschland GmbH & Co. KG
Heraeusstr. 12-14
63450 Hanau

Telephone : +496181351

E-mail address of person responsible for the SDS : sds@heraeus.com
(Heraeus Holding: EHS Chemical Safety)

1.4 Emergency telephone number

Emergency telephone number : +49 6132-84463
International Emergency Number
This telephone number is available 24 hours per day, 7 days per week.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Corrosive to metals, Category 1	H290: May be corrosive to metals.
Acute toxicity, Category 4	H332: Harmful if inhaled.
Skin corrosion, Sub-category 1A	H314: Causes severe skin burns and eye damage.
Serious eye damage, Category 1	H318: Causes serious eye damage.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms : 

Signal word : Danger

Hazard statements : H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

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H332 Harmful if inhaled.

Supplemental Hazard Statements : EUH071 Corrosive to the respiratory tract.

Precautionary statements :

Prevention:

P234 Keep only in original packaging.

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

Response:

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.

P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.

P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.

Hazardous components which must be listed on the label:

tris(nitrato-O)nitrosylruthenium
nitric acid

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : inorganic

Hazardous components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
tris(nitrato-O)nitrosylruthenium	34513-98-9 252-068-8 01-2120224303-72-XXXX	Ox. Sol. 2; H272 Met. Corr. 1; H290 Skin Corr. 1B; H314 Eye Dam. 1; H318	>= 30 - < 50
nitric acid	7697-37-2 231-714-2 007-004-00-1	Ox. Liq. 2; H272 Met. Corr. 1; H290 Acute Tox. 3; H331 Skin Corr. 1A; H314	>= 20 - < 30

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Heraeus

Trinitratonitrosyl-Ru(II) sol. LSAMP

Version
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	01-2119487297-23-XXXX	Eye Dam. 1; H318	
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The registration numbers listed here are valid if the company listed in Chapter 1 is located in the EU. For ingredients without a registration number there is no registration, because due to the annual amount no registration is required or the substance or its use according to Article 2 of the REACH Regulation (EC 1907/2006) is excluded from registration.

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

- General advice : First aider needs to protect himself.
Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
- If inhaled : Move to fresh air.
Get medical attention.
- In case of skin contact : Wash off immediately with plenty of water.
Take off all contaminated clothing immediately.
Get medical attention immediately.
Wash off with soap and plenty of water.
- In case of eye contact : In case of eye contact, remove contact lens and rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Keep eye wide open while rinsing.
Protect unharmed eye.
Call a physician immediately.
- If swallowed : Immediately give large quantities of water to drink.
Do NOT induce vomiting.
Get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed

- Risks : Causes serious eye damage.
Harmful if inhaled.
Corrosive to the respiratory tract.
Causes severe burns.

4.3 Indication of any immediate medical attention and special treatment needed

- Treatment : Treat symptomatically.

SAFETY DATA SHEET

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Heraeus

Trinitratonitrosyl-Ru(II) sol. LSAMP

Version
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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media : Do NOT use water jet.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting : Exposure to decomposition products may be a hazard to health.

Hazardous combustion products : Nitrogen oxides (NO_x)
Metal oxides

5.3 Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

Further information : Use a water spray to cool fully closed containers. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Follow safe handling advice and personal protective equipment recommendations.
Ensure adequate ventilation.
Evacuate personnel to safe areas.
Refer to protective measures listed in sections 7 and 8.

6.2 Environmental precautions

Environmental precautions : Do not allow contact with soil, surface or ground water.
Do not let product enter drains.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).
Sweep up or vacuum up spillage and collect in suitable container for disposal.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Heraeus

Trinitratonitrosyl-Ru(II) sol. LSAMP

Version
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Revision Date:
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6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

- Advice on safe handling : Provide sufficient air exchange and/or exhaust in work rooms. Wear personal protective equipment. Avoid inhalation, ingestion and contact with skin and eyes. Smoking, eating and drinking should be prohibited in the application area.
- Hygiene measures : Keep away from food and drink. Wash hands before breaks and at the end of workday. Keep working clothes separately. Remove and wash contaminated clothing and gloves, including the inside, before re-use.

7.2 Conditions for safe storage, including any incompatibilities

- Requirements for storage areas and containers : Keep tightly closed in a dry, cool and well-ventilated place.
- Storage class (TRGS 510) : 8B, Non-combustible, corrosive hazardous materials

7.3 Specific end use(s)

- Specific use(s) : No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
nitric acid	7697-37-2	STEL	1 ppm 2,6 mg/m ³	2006/15/EC
Further information	Indicative			
		STEL	1 ppm 2,6 mg/m ³	DE TRGS 900
Further information	European Union (The EU has established a limit value: deviations in value and peak limit are possible), A foundation for the derivation of a limit value is not available., The occupational limit value is only set as short term limit. The monitoring should be conducted over a 15 minutes period, e.g. by taking a 15 minute sample.			

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
nitric acid	Workers	Inhalation	Long-term systemic effects	2,6 mg/m ³
	Workers	Inhalation	Acute systemic effects	2,6 mg/m ³

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Heraeus

Trinitratonitrosyl-Ru(II) sol. LSAMP

Version
6.0

Revision Date:
12.08.2019

Date of last issue: 12.08.2019
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	Consumers	Inhalation	Long-term systemic effects	1,3 mg/m ³
	Consumers	Inhalation	Acute systemic effects	1,3 mg/m ³

8.2 Exposure controls

Engineering measures

Provide sufficient air exchange and/or exhaust in work rooms.

Personal protective equipment

Eye protection : Safety glasses with side-shields

Hand protection

Remarks

: Before removing gloves clean them with soap and water. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. As the product is a mixture of several substances, the durability of the glove materials cannot be calculated in advance and has to be tested before use.

Skin and body protection : Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

Filter type : Recommended Filter type:
Filter type ABEK-P

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : liquid
Colour : red
Odour : very faint
Odour Threshold : No data available

pH : < 0,0 (25 °C)

Melting point/range : No data available

Boiling point/boiling range : 110 °C
(1.013 hPa)

Flash point : Not applicable

Evaporation rate : No data available

Flammability (solid, gas) : Not applicable

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Heraeus

Trinitratonitrosyl-Ru(II) sol. LSAMP

Version 6.0 Revision Date: 12.08.2019 Date of last issue: 12.08.2019
Date of first issue: 27.11.2015

Upper explosion limit / Upper flammability limit : Not applicable

Lower explosion limit / Lower flammability limit : Not applicable

Vapour pressure : ≤ 1.100 hPa (50 °C)

Relative vapour density : No data available

Relative density : No data available

Density : No data available

Solubility(ies)

 Water solubility : soluble (20 °C, 1.013 hPa)

 Solubility in other solvents : No data available

Partition coefficient: n-octanol/water : Not applicable

Auto-ignition temperature : No data available

Decomposition temperature : No data available

Viscosity

 Viscosity, dynamic : No data available

 Viscosity, kinematic : No data available

Explosive properties : Not applicable

Oxidizing properties : The substance or mixture is not classified as oxidizing.

9.2 Other information

Self-ignition : Not applicable

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : No dangerous reaction known under conditions of normal use.

10.4 Conditions to avoid

Conditions to avoid : No data available

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Heraeus

Trinitratonitrosyl-Ru(II) sol. LSAMP

Version
6.0

Revision Date:
12.08.2019

Date of last issue: 12.08.2019
Date of first issue: 27.11.2015

10.5 Incompatible materials

Materials to avoid : No data available

10.6 Hazardous decomposition products

No data available

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Harmful if inhaled.

Product:

Acute inhalation toxicity : Assessment: The substance/mixture is not toxic on inhalation as defined by dangerous goods regulations.

Acute toxicity estimate: 15 mg/l

Exposure time: 4 h

Test atmosphere: vapour

Method: Calculation method

Components:

nitric acid:

Acute inhalation toxicity : LC50 (Rat): > 2,65 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 403
Assessment: Corrosive to the respiratory tract.

Skin corrosion/irritation

Causes severe burns.

Product:

Result : Corrosive after 3 minutes or less of exposure

Remarks : Expert judgement

Components:

nitric acid:

Result : Corrosive after 3 minutes or less of exposure

Remarks : Based on harmonised classification in EU regulation 1272/2008, Annex VI

Serious eye damage/eye irritation

Causes serious eye damage.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Heraeus

Trinitratonitrosyl-Ru(II) sol. LSAMP

Version
6.0

Revision Date:
12.08.2019

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Components:

nitric acid:

Result : Irreversible effects on the eye
Remarks : Based on skin corrosivity.

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Components:

nitric acid:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo : Test Type: Unscheduled DNA synthesis test (UDS) in testicular cells
Species: Mouse
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Carcinogenicity

Not classified based on available information.

Components:

nitric acid:

Species : Rat
Application Route : Ingestion
Exposure time : 273 days
Result : negative
Remarks : Based on data from similar materials

Reproductive toxicity

Not classified based on available information.

Components:

nitric acid:

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Heraeus

Trinitratonitrosyl-Ru(II) sol. LSAMP

Version
6.0

Revision Date:
12.08.2019

Date of last issue: 12.08.2019
Date of first issue: 27.11.2015

Result: negative
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative
Remarks: Based on data from similar materials

STOT - single exposure

Corrosive to the respiratory tract.

STOT - repeated exposure

Not classified based on available information.

Aspiration toxicity

Not classified based on available information.

SECTION 12: Ecological information

12.1 Toxicity

Components:

nitric acid:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 6.000 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 8.609 mg/l
Exposure time: 48 h
Remarks: Based on data from similar materials

Toxicity to microorganisms : EC50 : > 1.000 mg/l
Exposure time: 3 h
Remarks: Based on data from similar materials

Toxicity to fish (Chronic toxicity) : NOEC: 97,8 mg/l
Exposure time: 3 Months
Remarks: Based on data from similar materials

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

Components:

tris(nitrato-O)nitrosylruthenium:

Partition coefficient: n-octanol/water : Remarks: Not applicable

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Heraeus

Trinitratonitrosyl-Ru(II) sol. LSAMP

Version
6.0

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12.08.2019

Date of last issue: 12.08.2019
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12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher..

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : If recycling is not practicable, dispose of in compliance with local regulations.

Contaminated packaging : Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number

ADN : UN 3264
ADR : UN 3264
RID : UN 3264
IMDG : UN 3264
IATA : UN 3264

14.2 UN proper shipping name

ADN : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
(Trinitratonitrosylruthenium, Nitric acid)

ADR : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
(Trinitratonitrosylruthenium, Nitric acid)

RID : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
(Trinitratonitrosylruthenium, Nitric acid)

IMDG : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
(Trinitratonitrosylruthenium, Nitric acid)

IATA : Corrosive liquid, acidic, inorganic, n.o.s.
(Trinitratonitrosylruthenium, Nitric acid)

14.3 Transport hazard class(es)

ADN : 8

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Heraeus

Trinitratonitrosyl-Ru(II) sol. LSAMP

Version
6.0

Revision Date:
12.08.2019

Date of last issue: 12.08.2019
Date of first issue: 27.11.2015

ADR : 8
RID : 8
IMDG : 8
IATA : 8

14.4 Packing group

ADN
Packing group : II
Classification Code : C1
Hazard Identification Number : 80
Labels : 8

ADR
Packing group : II
Classification Code : C1
Hazard Identification Number : 80
Labels : 8
Tunnel restriction code : (E)

RID
Packing group : II
Classification Code : C1
Hazard Identification Number : 80
Labels : 8

IMDG
Packing group : II
Labels : 8
EmS Code : F-A, S-B

IATA (Cargo)
Packing instruction (cargo aircraft) : 855
Packing instruction (LQ) : Y840
Packing group : II
Labels : Corrosive

IATA (Passenger)
Packing instruction (passenger aircraft) : 851
Packing instruction (LQ) : Y840
Packing group : II
Labels : Corrosive

14.5 Environmental hazards

ADN
Environmentally hazardous : no

ADR
Environmentally hazardous : no

RID
Environmentally hazardous : no

IMDG

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Heraeus

Trinitratonitrosyl-Ru(II) sol. LSAMP

Version
6.0

Revision Date:
12.08.2019

Date of last issue: 12.08.2019
Date of first issue: 27.11.2015

Marine pollutant : no

14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59) : Not applicable
REACH - List of substances subject to authorisation (Annex XIV) : Not applicable
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer : Not applicable
Regulation (EC) No 850/2004 on persistent organic pollutants : Not applicable
Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals : Not applicable
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII) : Conditions of restriction for the following entries should be considered: Number on list 3
Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. : Not applicable
Water contaminating class (Germany) : WGK 3 highly hazardous to water
Classification according to AwSV, Annex 1 (5.2)

Other regulations:

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Full text of H-Statements

H272 : May intensify fire; oxidizer.
H290 : May be corrosive to metals.
H314 : Causes severe skin burns and eye damage.
H318 : Causes serious eye damage.
H331 : Toxic if inhaled.

SAFETY DATA SHEET

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Full text of other abbreviations

Acute Tox.	:	Acute toxicity
Eye Dam.	:	Serious eye damage
Met. Corr.	:	Corrosive to metals
Ox. Liq.	:	Oxidizing liquids
Ox. Sol.	:	Oxidizing solids
Skin Corr.	:	Skin corrosion
2006/15/EC	:	Europe. Indicative occupational exposure limit values
DE TRGS 900	:	Germany. TRGS 900 - Occupational exposure limit values.
2006/15/EC / STEL	:	Short term exposure limit
DE TRGS 900 / STEL	:	Short term limit

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Classification of the mixture:

Met. Corr. 1	H290
Acute Tox. 4	H332
Skin Corr. 1A	H314
Eye Dam. 1	H318

Classification procedure:

Calculation method
Calculation method
Based on product data or assessment
Based on product data or assessment

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The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

DE / EN