Safety Data Sheet

NIGLOSS-RTU - BRIGHT NICKEL PLATING BATH

Safety Data Sheet dated 4/15/2024 version 3

Compliant with regulation (CE) n. 1907/2006 REACH, Annex II, and subsequent amendments introduced by Commission Regulation (EU) no. 2020/878

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

1.1. Product identifier

Mixture identification:

Trade name: NIGLOSS-RTU - BRIGHT NICKEL PLATING BATH

Trade code: NIGLOSS-RTU

Product type and use: Ready to use electroplating bright nickel

Registration Number N/A

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

Recommended use: For electroplating industry

Uses advised against: N.A.

1.3. Details of the supplier of the safety data sheet

Company: LEGOR GROUP S.p.A.
Via del Lavoro, 1
36050 Bressanvido (VI)
Italy
Tel.: +39.0444.467911
Fax.: +39.0444. 660677

Competent person responsible for the safety data sheet: info@legor.com

1.4. Emergency telephone number

CENTRO ANTIVELENI OSPEDALE NIGUARDA CA' GRANDA
P.ZZA OSPEDALE MAGGIORE, 3 MILANO
Tel 02 66101029 Fax 02 64442768

AZIENDA OSPEDALIERA PAPA GIOVANNI XXIII PIAZZA OMS, 1 24127 BERGAMO
Tel 800 883300

CENTRO ANTIVELENI AZIENDA OSPEDALIERA S.G.BATTISTA - MOLINETTE DI TORINO
CORSO A.M. DOGLIOTTI, 14 TORINO
Tel 011 6637637 Fax 011 6672149

CEN.NAZ.INFORM.TOSSIC.FOND. S.MAUGERI CLINICA DEL LAVORO E DELLA RIABILITAZIONE
VIA A.FERRATA, 8 PAVIA
Tel A 0382 24444 Fax 02 64442769

SERV. ANTIV. - CEN.INTERDIPARTIMENTALE DI RICERCA SULLE INTOSSICAZIONI ACUTE DIP.DI FARMAC. E.MENEGHETTI UNIVERSITÀ DEGLI STUDI DI PADOVA
LARGO E.MENEGHETTI, 2 PADOVA
Tel 049 8275078 Fax 049 8270593

SERVIZIO ANTIVELENI SERV.PR.SOCC., ACCETT. E OSS. ISTITUTO SCIENTIFICO G. GASLINI
LARGO G. GASLINI, 5 GENOVA
Tel 010 5636245 Fax 010 3760873

CENTRO ANTIVELENI - U.O. TOSSICOLOGIA MEDICA AZIENZA OSPEDALIERA CAREGGI
VIALE G.B. MORGAGNI, 65 FIRENZE
Tel 055 4277238 Fax 055 4277925

CENTRO ANTIVELENI POLICLINICO A.GEMELLI - UNIVERSITA' CATTOLICA DEL SACRO CUORE
LARGO F.VITO, 1 ROMA
Tel 06 3054343 Fax 06 3051343

CENTRO ANTIVELENI - ISTITUTO DI ANESTESIOLOGIA E RIANIMAZIONE UNIVERSITÀ DEGLI STUDI DI ROMA LA SAPIENZA
VIALE DEL POLICLINICO, 155 ROMA
Tel 06 49970698 Fax 06 4461967

AZ. OSP. UNIV. FOGGIA
V.LE LUIGI PINTO, 1 71122 FOGGIA
Tel 0881 732326

CENTRO ANTIVELENI AZIENDA OSPEDALIERA A. CARDARELLI
VIA CARDARELLI, 9 NAPOLI
Tel 081 7472870 Fax 081 7472880

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Regulation (EC) n. 1272/2008 (CLP)

Acute Tox. 4	Harmful if swallowed.
Skin Irrit. 2	Causes skin irritation.
Eye Irrit. 2	Causes serious eye irritation.
Resp. Sens. 1	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin Sens. 1	May cause an allergic skin reaction.
Muta. 2	Suspected of causing genetic defects if inhaled, in contact with skin and if swallowed.
Carc. 1A	May cause cancer by inhalation.
Repr. 1B	May damage fertility. May damage the unborn child.
STOT RE 1	Causes damage to organs through prolonged or repeated exposure if inhaled, in contact with skin and if swallowed.
Aquatic Acute 1	Very toxic to aquatic life.
Aquatic Chronic 1	Very toxic to aquatic life with long lasting effects.

Adverse physicochemical, human health and environmental effects:

No other hazards

2.2. Label elements

Regulation (EC) No 1272/2008 (CLP):

Pictograms and Signal Words

Danger

Hazard statements

H302	Harmful if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H341	Suspected of causing genetic defects if inhaled, in contact with skin and if swallowed.
H350i	May cause cancer by inhalation.
H360FD	May damage fertility. May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure if inhaled, in contact with skin and if swallowed.

H410	Very toxic to aquatic life with long lasting effects.

Precautionary statements

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P342+P311	If experiencing respiratory symptoms: Call a doctor.
P391	Collect spillage.

Contains

Nickel Sulfate Hexahydrate

Nickel chloride hexahydrate

Boric acid

Special provisions according to Annex XVII of REACH and subsequent amendments:

None.

2.3. Other hazards

No PBT, vPvB or endocrine disruptor substances present in concentration >= 0.1%

Other Hazards: No other hazards

SECTION 3: Composition/information on ingredients

3.1. Substances

N.A.

3.2. Mixtures

Mixture identification: NIGLOSS-RTU - BRIGHT NICKEL PLATING BATH

Hazardous components within the meaning of the CLP regulation and related classification:

Qty	Name	Ident. Numb.	Classification	Registration Number	Material Properties
≥25 - <35 %	Nickel Sulfate Hexahydrate	CAS:10101-97-0 EC:232-104-9 Index:028-009-00-5	Acute Tox. 4, H302 Acute Tox. 4, H332 Skin Irrit. 2, H315 Muta. 2, H341 STOT RE 1, H372 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 1A, H350i Repr. 1B, H360D, M-Chronic:1, M-Acute:1 Specific Concentration Limits: C ≥ 1%: STOT RE 1 H372 0.1% ≤ C < 1%: STOT RE 2 H373 C ≥ 20%: Skin Irrit. 2 H315 C ≥ 0.01%: Skin Sens. 1 H317	01-2119439361-44-000	
≥5 - <10 %	Nickel chloride hexahydrate	CAS:7791-20-0 EC:231-743-0 Index:028-011-00-6	Muta. 2, H341; Acute Tox. 3, H301; Acute Tox. 3, H331; STOT RE 1, H372; Skin Irrit. 2, H315; Aquatic Chronic 1, H410; Carc. 1A, H350i; Repr. 1B, H360D; Resp. Sens. 1, H334; Skin Sens. 1, H317	01-2119486973-20-xxxx	
≥1 - <5 %	Boric acid	CAS:10043-35-3 EC:233-139-2 Index:005-007-00-2	Repr. 1B, H360FD	01-2119486683-25-XXXX	SVHC

SECTION 4: First aid measures

4.1. Description of first aid measures

In case of skin contact:

Immediately take off all contaminated clothing.

Areas of the body that have - or are only even suspected of having - come into contact with the product must be rinsed immediately with plenty of running water and possibly with soap.

Wash thoroughly the body (shower or bath).

Remove contaminated clothing immediatley and dispose off safely.

After contact with skin, wash immediately with soap and plenty of water.

In case of eyes contact:

After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an opthalmologist immediately.

Protect uninjured eye.

In case of Ingestion:

Give nothing to eat or drink.

In case of Inhalation:

If breathing is irregular or stopped, administer artificial respiration.

In case of inhalation, consult a doctor immediately and show him packing or label.

4.2. Most important symptoms and effects, both acute and delayed

Eye irritation

Eye damages

Skin Irritation

Erythema

4.3. Indication of any immediate medical attention and special treatment needed

In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Water.

Carbon dioxide (CO_2).

Extinguishing media which must not be used for safety reasons:

None in particular.

5.2. Special hazards arising from the substance or mixture

Do not inhale explosion and combustion gases.

Burning produces heavy smoke.

5.3. Advice for firefighters

Use suitable breathing apparatus .

Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Move undamaged containers from immediate hazard area if it can be done safely.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Wear personal protection equipment.

Wear breathing apparatus if exposed to vapours/dusts/aerosols.

Provide adequate ventilation.

Use appropriate respiratory protection.

See protective measures under point 7 and 8.

For emergency responders:

Wear personal protection equipment.

6.2. Environmental precautions

Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.

Retain contaminated washing water and dispose it.

In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

Suitable material for taking up: absorbing material, organic, sand

6.3. Methods and material for containment and cleaning up

Suitable material for taking up: absorbing material, organic, sand

Wash with plenty of water.

6.4. Reference to other sections

See also section 8 and 13

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Avoid contact with skin and eyes, inhalation of vapours and mists.

Exercise the greatest care when handling or opening the container.

Use localized ventilation system.

Don't use empty container before they have been cleaned.

Before making transfer operations, assure that there aren't any incompatible material residuals in the containers.

Contamined clothing should be changed before entering eating areas.

Do not eat or drink while working.

See also section 8 for recommended protective equipment.

7.2. Conditions for safe storage, including any incompatibilities

Incompatible materials:

None in particular.

Instructions as regards storage premises:

Adequately ventilated premises.

7.3. Specific end use(s)

Recommendation(s)

None in particular

Industrial sector specific solutions:

None in particular

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Community Occupational Exposure Limits (OEL)

	OEL Type	Occupational Exposure Limit
Nickel Sulfate Hexahydrate CAS: 10101-97-0	ACGIH	Long Term: 0.1 mg/m3
Boric acid CAS: 10043-35-3	ACGIH	Long Term: 2 mg/m3; Short Term: 6 mg/m3 (I), A4 - URT irr
	OSHA	Long Term: 15 mg/m3 Total powder
	OSHA	Long Term: 5 mg/m3 Breathable powder

Predicted No Effect Concentration (PNEC) values

Nickel Sulfate Hexahydrate CAS: 10101-97-0	Exposure Route: Fresh Water; PNEC Limit: 0.0071 mg/l
	Exposure Route: Marine water; PNEC Limit: 0.0086 mg/l
	Exposure Route: Terrestrial compartment; PNEC Limit: 29.9 mg/kg
	Exposure Route: STP; PNEC Limit: 0.33 mg/l
	Exposure Route: Freshwater sediments; PNEC Limit: 136 mg/kg/d
	Exposure Route: Marine water sediments; PNEC Limit: 109 mg/kg/d
	Exposure Route: Secondary poisoning; PNEC Limit: 120 mg/kg Remark: food for predators
Boric acid CAS: 10043-35-3	Exposure Route: Marine water; PNEC Limit: 2.9 mg/l
	Exposure Route: Fresh Water; PNEC Limit: 2.9 mg/l
	Exposure Route: Soil; PNEC Limit: 5.7 mg/kg
	Exposure Route: STP; PNEC Limit: 10 ng/l
	Exposure Route: Intermittent releases (marine water); PNEC Limit: 13.7 mg/l

Derived No Effect Level (DNEL) values

Nickel Sulfate Hexahydrate CAS: 10101-97-0	Exposure Route: Human Oral; Exposure Frequency: Acute sistemic Consumer: 0.011 mg/kg bw/d
	Exposure Route: Human Oral; Exposure Frequency: Chronic Systemic Consumer: 0.37 mg/kg bw/d
	Exposure Route: Human Inhalation; Exposure Frequency: Local acute Worker Industry: 1.6 mg/m3; Consumer: 0.1 mg/m3

	Exposure Route: Human Inhalation; Exposure Frequency: Acute sistemic Worker Industry: 104 mg/m3; Consumer: 8.8 mg/m3
	Exposure Route: Human Inhalation; Exposure Frequency: Local chronic Worker Industry: 0.05 mg/m3; Consumer: 0.00006 mg/m3
	Exposure Route: Human Inhalation; Exposure Frequency: Chronic Systemic Worker Industry: 0.05 mg/m3; Consumer: 0.00006 mg/m3
	Exposure Route: Human Dermal; Exposure Frequency: Local acute Worker Industry: 0.00044 mg/cm2
Boric acid CAS: 10043-35-3	Exposure Route: Human Inhalation; Exposure Frequency: Long Term, systemic effects Worker Industry: 8.3 mg/m3
	Exposure Route: Human Dermal; Exposure Frequency: Long Term, systemic effects Worker Industry: 392 mg/kg/d
	Exposure Route: Human Inhalation; Exposure Frequency: Long Term, systemic effects Consumer: 4.15 mg/m3
	Exposure Route: Human Dermal; Exposure Frequency: Long Term, systemic effects Consumer: 196 mg/kg bw/d
	Exposure Route: Human Oral; Exposure Frequency: Short Term, systemic effects Consumer: 0.98 mg/kg bw/d
	Exposure Route: Human Oral; Exposure Frequency: Long Term, systemic effects Consumer: 0.98 mg/kg bw/d

8.2. Exposure controls

Eye protection:

Use close fitting safety goggles, don't use eye lens.

Protection for skin:

Use clothing that provides comprehensive protection to the skin, e.g. cotton, rubber, PVC or viton.

Protection for hands:

Use protective gloves that provides comprehensive protection, e.g. P.V.C., neoprene or rubber.

Respiratory protection:

Use adequate protective respiratory equipment.

Thermal Hazards:

N.A.

Environmental exposure controls:

N.A.

Hygienic and Technical measures

N.A.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical State: Liquid
Color: green
Odour: Typical
Odour threshold: N.A.
pH: 4,50
Kinematic viscosity: N.A.
Melting point / freezing point: N.A.
Initial boiling point and boiling range: N.A.
Flash point: > 93°C
Upper/lower flammability or explosive limits: N.A.
Vapour density: N.A.
Vapour pressure: N.A.
Relative density: 1,00 g/cm3
Solubility in water: N.A.
Solubility in oil: N.A.
Partition coefficient (n-octanol/water): N.A.
Nanoforms dispersion stability: N.A.
Auto-ignition temperature: N.A.
Decomposition temperature: N.A.
Flammability: N.A.

Particle characteristics:

Particle size: N.A.

9.2. Other information

VOC: N.A.

Miscibility: N.A.

Conductivity: N.A.

Evaporation rate: N.A.

No other relevant information

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under normal conditions

10.2. Chemical stability

Data not available.

10.3. Possibility of hazardous reactions

None.

10.4. Conditions to avoid

Stable under normal conditions.

10.5. Incompatible materials

None in particular.

10.6. Hazardous decomposition products

None.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Toxicological Information of the Preparation

a) acute toxicity	The product is classified: Acute Tox. 4(H302)
b) skin corrosion/irritation	The product is classified: Skin Irrit. 2(H315)
c) serious eye damage/irritation	The product is classified: Eye Irrit. 2(H319)
d) respiratory or skin sensitisation	The product is classified: Resp. Sens. 1(H334), Skin Sens. 1(H317)
e) germ cell mutagenicity	The product is classified: Muta. 2(H341)
f) carcinogenicity	The product is classified: Carc. 1A(H350)
g) reproductive toxicity	The product is classified: Repr. 1B(H360)
h) STOT-single exposure	Not classified
	Based on available data, the classification criteria are not met
i) STOT-repeated exposure	The product is classified: STOT RE 1(H372)
j) aspiration hazard	Not classified
	Based on available data, the classification criteria are not met

Toxicological information on main components of the mixture:

Nickel Sulfate Hexahydrate	a) acute toxicity	LC50 Inhalation Rat = 2.48 mg/l 4h	OECD
		LD50 Oral Rat = 361 mg/kg	OECD-425
	f) carcinogenicity	Carcinogenicity Oral Rat	2 years treatment: Keratoacanthoma
Boric acid	a) acute toxicity	LD50 Oral Rat = 4080 mg/kg	
		LC50 Inhalation Rat > 2.03 mg/l	
		LD50 Skin Rabbit > 2000 mg/kg	

11.2. Information on other hazards

Endocrine disrupting properties:

No endocrine disruptor substances present in concentration >= 0.1%

SECTION 12: Ecological information

12.1. Toxicity

Adopt good working practices, so that the product is not released into the environment.

Eco-Toxicological Information:

Very toxic to aquatic life with long lasting effects.

List of Eco-Toxicological properties of the product

The product is classified: Aquatic Acute 1(H400), Aquatic Chronic 1(H410)

List of Eco-Toxicological properties of the components

Component	Ident. Numb.	Ecotox Data
Nickel Sulfate Hexahydrate	CAS: 10101-97-0 - EINECS: 232-104-9 - INDEX: 028-009-00-5	a) Aquatic acute toxicity : LC50 Fish Rainbow trout = 15.3 mg/l 96
		a) Aquatic acute toxicity : EC50 Shellfish Daphnia magna = 6.68 mg/l 48
		a) Aquatic acute toxicity : EC50 Algae Pseudokirchneriella subcapitata = 81.5 mg/l 72
Boric acid	CAS: 10043-35-3 - EINECS: 233-139-2 - INDEX: 005-007-00-2	a) Aquatic acute toxicity : LC50 Fish Pimephales promelas = 79.7 mg/l
		b) Aquatic chronic toxicity : NOEC Fish Brachydanio rerio = 6.4 mg/l
		a) Aquatic acute toxicity : NOEC Shellfish Daphnia magna = 14.2 mg/l
		a) Aquatic acute toxicity : LC50 Marine water invertebrates Ceriodaphnia dubia = 91 mg/l
		a) Aquatic acute toxicity : EC50 Algae Pseudokirchneriella subcapitata = 52.4 mg/l
		b) Aquatic chronic toxicity : NOEC Algae Pseudokirchneriella subcapitata = 17.5 mg/l

12.2. Persistence and degradability

Component	Persitence/Degradability:	Notes:
Boric acid	Persistent and Biodegradable	> 10000 mg/l

12.3. Bioaccumulative potential

Component	Bioaccumulation	Test	Value	Notes:
Boric acid	Bioaccumulative	Kow - Partition coefficient	-0.757	log Pow

12.4. Mobility in soil

N.A.

12.5. Results of PBT and vPvB assessment

No PBT Ingredients are present

12.6. Endocrine disrupting properties

No endocrine disruptor substances present in concentration >= 0.1%

12.7. Other adverse effects

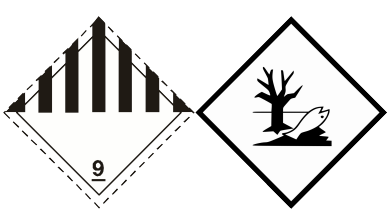
N.A.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Recover, if possible. Send to authorised disposal plants or for incineration under controlled conditions. In so doing, comply with the local and national regulations currently in force.

SECTION 14: Transport information



14.1. UN number or ID number

3082

14.2. UN proper shipping name

ADR-Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Nickel Sulfate Hexahydrate - Nickel chloride hexahydrate)

IATA-Technical name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Nickel Sulfate Hexahydrate, Nickel chloride hexahydrate)

IMDG-Technical name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Nickel Sulfate Hexahydrate, Nickel chloride hexahydrate)

14.3. Transport hazard class(es)

ADR-Class: 9

IATA-Class: 9

IMDG-Class: 9

14.4. Packing group

ADR-Packing Group: III

IATA-Packing group: III

IMDG-Packing group: III

14.5. Environmental hazards

Yes

Environmental Pollutant: Yes

14.6. Special precautions for user

Road and Rail (ADR-RID):

ADR-Label: 9

ADR - Hazard identification number: 90

ADR-Special Provisions: 274 335 375 601

ADR-Transport category (Tunnel restriction code): (E)

Air (IATA):

IATA-Passenger Aircraft: 964

IATA-Cargo Aircraft: 964

IATA-Label: 9

IATA-Subsidiary hazards: -

IATA-Erg: 9L

IATA-Special Provisions: A97 A158 A197

Sea (IMDG):

IMDG-Stowage Code: Category A

IMDG-Stowage Note: -

IMDG-Subsidiary hazards: -

IMDG-Special Provisions: 274 335 969

IMDG-EMS: F-A, S-F

14.7. Maritime transport in bulk according to IMO instruments

N.A.

SECTION 15: Regulatory information

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

Dir. 98/24/EC (Risks related to chemical agents at work)

Dir. 2000/39/EC (Occupational exposure limit values)

Regulation (EC) n. 1907/2006 (REACH)

Regulation (EC) n. 1272/2008 (CLP)

Regulation (EC) n. 790/2009 (ATP 1 CLP) and (EU) n. 758/2013

Regulation (EU) n. 2020/878

Regulation (EU) n. 286/2011 (ATP 2 CLP)

Regulation (EU) n. 618/2012 (ATP 3 CLP)

Regulation (EU) n. 487/2013 (ATP 4 CLP)

Regulation (EU) n. 944/2013 (ATP 5 CLP)

Regulation (EU) n. 605/2014 (ATP 6 CLP)

Regulation (EU) n. 2015/1221 (ATP 7 CLP)

Regulation (EU) n. 2016/918 (ATP 8 CLP)

Regulation (EU) n. 2016/1179 (ATP 9 CLP)

Regulation (EU) n. 2017/776 (ATP 10 CLP)

Regulation (EU) n. 2018/669 (ATP 11 CLP)

Regulation (EU) n. 2018/1480 (ATP 13 CLP)

Regulation (EU) n. 2019/521 (ATP 12 CLP)

Regulation (EU) n. 2020/217 (ATP 14 CLP)
Regulation (EU) n. 2020/1182 (ATP 15 CLP)
Regulation (EU) n. 2021/643 (ATP 16 CLP)
Regulation (EU) n. 2021/849 (ATP 17 CLP)
Regulation (EU) n. 2022/692 (ATP 18 CLP)

Restrictions related to the product or the substances contained according to Annex XVII Regulation (EC) 1907/2006 (REACH) and subsequent modifications:

Restrictions related to the product: 3

Restrictions related to the substances contained: 75

Provisions related to directive EU 2012/18 (Seveso III):

Seveso III category according to Annex 1, part 1	Lower-tier threshold (tonnes)	Upper-tier threshold (tonnes)
Product belongs to category: E1	100	200

Regulation (EU) No 649/2012 (PIC regulation)

No substances listed

German Water Hazard Class.

Class 3: extremely hazardous.

SVHC Substances:

Substances in candidate list (Art. 59 Reg. 1907/2006, REACH):

Component	Ident. Numb.	Quantity	Material Properties
Boric acid	CAS: 10043-35-3	>=1 - <5 %	SVHC
	EINECS: 233-139-2		Repr. Cat. 3.7/1B;
	Index: 005-007-00-2		

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out for the mixture.

SECTION 16: Other information

Code	Description
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H341	Suspected of causing genetic defects.
H341	Suspected of causing genetic defects if inhaled, in contact with skin and if swallowed.
H350i	May cause cancer by inhalation.
H360D	May damage the unborn child.
H360FD	May damage fertility. May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H372	Causes damage to organs through prolonged or repeated exposure if inhaled, in contact with skin and if swallowed.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Code	Hazard class and hazard category	Description
3.1/3/Inhal	Acute Tox. 3	Acute toxicity (inhalation), Category 3
3.1/3/Oral	Acute Tox. 3	Acute toxicity (oral), Category 3
3.1/4/Inhal	Acute Tox. 4	Acute toxicity (inhalation), Category 4
3.1/4/Oral	Acute Tox. 4	Acute toxicity (oral), Category 4
3.2/2	Skin Irrit. 2	Skin irritation, Category 2
3.3/2	Eye Irrit. 2	Eye irritation, Category 2
3.4.1/1	Resp. Sens. 1	Respiratory Sensitisation, Category 1

3.4.2/1	Skin Sens. 1	Skin Sensitisation, Category 1
3.5/2	Muta. 2	Germ cell mutagenicity, Category 2
3.6/1A	Carc. 1A	Carcinogenicity, Category 1A
3.7/1B	Repr. 1B	Reproductive toxicity, Category 1B
3.9/1	STOT RE 1	Specific target organ toxicity — repeated exposure, Category 1
4.1/A1	Aquatic Acute 1	Acute aquatic hazard, category 1
4.1/C1	Aquatic Chronic 1	Chronic (long term) aquatic hazard, category 1

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Classification according to Regulation (EC) Nr. 1272/2008	Classification procedure
3.1/4/Oral	Calculation method
3.2/2	Calculation method
3.3/2	Calculation method
3.4.1/1	Calculation method
3.4.2/1	Calculation method
3.5/2	Calculation method
3.6/1A	Calculation method
3.7/1B	Calculation method
3.9/1	Calculation method
4.1/A1	Calculation method
4.1/C1	Calculation method

This document was prepared by a competent person who has received appropriate training.

Main bibliographic sources:

ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre, Commission of the European Communities

SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eight Edition - Van Nostrand Reinold

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.

It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

This MSDS cancels and replaces any preceding release.

Legend to abbreviations and acronyms used in the safety data sheet:

ACGIH: American Conference of Governmental Industrial Hygienists

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.

AND: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways

ATE: Acute Toxicity Estimate

ATEmix: Acute toxicity Estimate (Mixtures)

BCF: Biological Concentration Factor

BEI: Biological Exposure Index

BOD: Biochemical Oxygen Demand

CAS: Chemical Abstracts Service (division of the American Chemical Society).

CAV: Poison Center

CE: European Community

CLP: Classification, Labeling, Packaging.

CMR: Carcinogenic, Mutagenic and Reprotoxic

COD: Chemical Oxygen Demand

COV: Volatile Organic Compound

CSA: Chemical Safety Assessment

CSR: Chemical Safety Report

DMEL: Derived Minimal Effect Level

DNEL: Derived No Effect Level.

DPD: Dangerous Preparations Directive

DSD: Dangerous Substances Directive

EC50: Half Maximal Effective Concentration

ECHA: European Chemicals Agency

EINECS: European Inventory of Existing Commercial Chemical Substances.

ES: Exposure Scenario

GefStoffVO: Ordinance on Hazardous Substances, Germany.

GHS: Globally Harmonized System of Classification and Labeling of Chemicals.

IARC: International Agency for Research on Cancer

IATA: International Air Transport Association.
IATA-DGR: Dangerous Goods Regulation by the "International Air Transport Association" (IATA).
IC50: half maximal inhibitory concentration
ICAO: International Civil Aviation Organization.
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO).
IMDG: International Maritime Code for Dangerous Goods.
INCI: International Nomenclature of Cosmetic Ingredients.
IRCCS: Scientific Institute for Research, Hospitalization and Health Care
KAFH: KAFH
KSt: Explosion coefficient.
LC50: Lethal concentration, for 50 percent of test population.
LD50: Lethal dose, for 50 percent of test population.
LDLo: Leathal Dose Low
N.A.: Not Applicable
N/A: Not Applicable
N/D: Not defined/ Not available
NA: Not available
NIOSH: National Institute for Occupational Safety and Health
NOAEL: No Observed Adverse Effect Level
OSHA: Occupational Safety and Health Administration.
PBT: Persistent, Bioaccumulative and Toxic
PGK: Packaging Instruction
PNEC: Predicted No Effect Concentration.
PSG: Passengers
RID: Regulation Concerning the International Transport of Dangerous Goods by Rail.
STEL: Short Term Exposure limit.
STOT: Specific Target Organ Toxicity.
TLV: Threshold Limiting Value.
TWATLV: Threshold Limit Value for the Time Weighted Average 8 hour day. (ACGIH Standard).
vPvB: Very Persistent, Very Bioaccumulative.
WGK: German Water Hazard Class.

Paragraphs modified from the previous revision:

- 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING
- 2. HAZARDS IDENTIFICATION
- 3. COMPOSITION/INFORMATION ON INGREDIENTS
- 4. FIRST AID MEASURES
- 6. ACCIDENTAL RELEASE MEASURES
- 7. HANDLING AND STORAGE
- 8. EXPOSURE CONTROLS/PERSONAL PROTECTION
- 9. PHYSICAL AND CHEMICAL PROPERTIES
- 11. TOXICOLOGICAL INFORMATION
- 12. ECOLOGICAL INFORMATION
- 15. REGULATORY INFORMATION
- 16. OTHER INFORMATION