



Kollant S.r.l.

Revision nr. 3

Dated 06/12/2018

MK180207 - RATIBROM 2 PASTE

Printed on 31/05/2019

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Safety Data Sheet

According to Annex II to REACH – Regulation 2015/830

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

1.1. Product identifier

Code: **MK180207**
Product name: **RATIBROM 2 PASTE**
Chemical name and synonym: **Bromadiolon (0.005%) - Denatonium benzoate (0.001%)**

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

Intended use: **Ready to use raticide for professional use.**

Identified Uses	Industrial	Professional	Consumer
Biocidal products (e.g. Disinfectants, pest control)	-	✓	-

1.3. Details of the supplier of the safety data sheet

Name: **Kollant S.r.l.**
Full address: **Via C. Colombo, 7/7A**
District and Country: **30030 Vigonovo (VE)**
Italia
Tel. +39 049 9983000
Fax +39 049 9983005

e-mail address of the competent person responsible for the Safety Data Sheet

info@kollant.it

1.4. Emergency telephone number

For urgent inquiries refer to

CAVp Osp. Pediatrico Bambino Gesù - Tel. 06-68593726
Az. Osp. Univ. Foggia - Tel. 0881-732326
Az. Osp. 'A. Cardarelli' - Tel. 081-7472870
CAV Policlinico 'Umberto I' - Tel. 06-49978000
CAV Policlinico 'A. Gemelli' - Tel. 06-3054343
Az. Osp. 'Careggi' U.O. Tossicologia Medica - Tel. 055-7947819
CAV Centro Nazionale di Informazione Tossicologica - Tel. 0382-24444
Osp. Niguarda Ca' Granda - Tel. 02-66101029
Azienda Ospedaliera Papa Giovanni XXIII - Tel. 800883300

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in (EC) Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of (EU) Regulation 2015/830. Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Reproductive toxicity, category 1B	H360D	May damage the unborn child.
Specific target organ toxicity - repeated exposure, category 1	H372	Causes damage to organs through prolonged or repeated exposure.

**MK180207 - RATIBROM 2 PASTE****2.2. Label elements**

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words: Danger

Hazard statements:

H360D May damage the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure.
Restricted to professional users.

Precautionary statements:

P102 Keep out of reach of children.
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P264 Wash hands thoroughly after handling.
P280 Wear protective gloves.
P308+P313 IF exposed or concerned: Get medical advice / attention.
P405 Store locked up.
P501 Dispose of contents / container according to the current national regulation.

Contains: BROMADIOLONE

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients**3.1. Substances**

Information not relevant

3.2. Mixtures

Contains:

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Identification	x = Conc. %	Classification 1272/2008 (CLP)
1,2-PROPANEDIOL		
CAS 57-55-6	$1 \leq x < 5$	
EC 200-338-0		
INDEX -		
TRIETHANOLAMINE		
CAS 102-71-6	$0 \leq x < 0,5$	Eye Irrit. 2 H319, Skin Irrit. 2 H315, STOT SE 3 H335
EC 203-049-8		
INDEX -		
POLYETHYLENGLYCOL		
CAS 25322-68-3	$0 \leq x < 0,5$	
EC 500-038-2		
INDEX -		
2-BROMO-2-NITROPROPAN-1,3-DIOL		
CAS 52-51-7	$0 \leq x < 0,5$	Acute Tox. 4 H302, Acute Tox. 4 H312, Eye Dam. 1 H318, Skin Irrit. 2 H315, STOT SE 3 H335, Aquatic Acute 1 H400 M=10
EC 200-143-0		
INDEX 603-085-00-8		
BROMADIOLONE		
CAS 28772-56-7	$0,005 \leq x < 0,25$	Repr. 1B H360D, Acute Tox. 1 H300, Acute Tox. 1 H310, Acute Tox. 1 H330, STOT RE 1 H372, Aquatic Acute 1 H400 M=1, Aquatic Chronic 1 H410 M=1
EC 249-205-9		
INDEX -		

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures

4.1. Description of first aid measures

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 30-60 minutes, opening the eyelids fully. Get medical advice/attention.

SKIN: Remove contaminated clothing. Rinse skin with a shower immediately. Get medical advice/attention.

INGESTION: Have the subject drink as much water as possible. Get medical advice/attention. Do not induce vomiting unless explicitly authorised by a doctor.

INHALATION: Get medical advice/attention immediately. Remove victim to fresh air, away from the accident scene. If the subject stops breathing, administer artificial respiration. Take suitable precautions for rescue workers.

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

Bromadiolone is a rodenticide anticoagulant of the second generation and, as other coumarin derivatives, is a K vitamin antagonist. It blocks usual mechanisms of blood coagulation, with consequent profuse internal bleeding and death.

- Lethal in case of skin contact; it would be absorbed and cause internal bleeding.
- Lethal in case of ingestion; serious risk of internal bleeding.
- Harmful in case of inhalation; serious risk of internal bleeding.
- Symptoms may be associated to an increased tendency of bleeding.

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

General information:

In case of doubt, or if symptoms persist, consult a doctor, showing the label and/or this MSDS.



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The first treatment, in case of injury, has to be done by qualified personnel, in order to avoid further complications.

Medical information:

Anticoagulant raticides, as Bromadiolone, act blocking K 2,3 vitamin regeneration to K-hydroquinone vitamin, through inhibition of the K Vitamin epoxide reductase enzyme.

K vitamin is necessary to the synthesis of important proteins as prothrombin, essential for blood coagulating process.

Therefore, the progressive reduction of K vitamin involves an increase of the probability of fatal haemorrhagies.

1. Check prothrombinic activity several times, also after some days, especially in case of the ingestion of high quantities of product.
Diagnosis: variations of prothrombine time (symptoms and coagulation test).
Treatment: K1 vitamin.
2. In animals (particularly in domestic animals), K1 vitamin can be administered also in absence of coagulation alterations; this is due to the gravity of the potential haemorrhagy in case of ingestion.

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Block the leakage if there is no hazard.

Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Collect the leaked product into a suitable container. If the product is flammable, use explosion-proof equipment. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.

Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.



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MK180207 - RATIBROM 2 PASTE**6.4. Reference to other sections**

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage**7.1. Precautions for safe handling**

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use. Remove any contaminated clothes and personal protective equipment before entering places in which people eat.

7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container. Store the containers sealed, in a well ventilated place, away from direct sunlight. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection**8.1. Control parameters**

Regulatory References:

AUS	Österreich	Grenzwerteverordnung 2011 - GKV 2011
BEL	Belgique	AR du 11/3/2002. La liste est mise à jour pour 2010
CHE	Suisse / Schweiz	Valeurs limites d'exposition aux postes de travail 2014. / Grenzwerte am Arbeitsplatz
DEU	Deutschland	TRGS 900 (Fassung 31.1.2018 ber.) - Liste der Arbeitsplatzgrenzwerte und Kurzzeitwerte
DNK	Danmark	Graensevaerdier per stoffer og materialer
ESP	España	INSHT - Límites de exposición profesional para agentes químicos en España 2017
FIN	Suomi	HTP-arvot 2012. Haitallisiksi tunnetut pitoisuudet - Sosiaali- ja terveystieteiden tutkimuskeskus julkaisuja 2012:5
GBR	United Kingdom	EH40/2005 Workplace exposure limits
IRL	Éire	Code of Practice Chemical Agent Regulations 2011
NLD	Nederland	Databank of the social and Economic Council of Netherlands (SER) Values, AF 2011:18
NOR	Norge	Veiledning om Administrative normer for forurensning i arbeidsatmosfære
SWE	Sverige	Occupational Exposure Limit Values, AF 2011:18
	TLV-ACGIH	ACGIH 2017

1,2-PROPANEDIOL**Threshold Limit Value**

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
WEL	GBR	474	150		
OEL	IRL	10			

TRIETHANOLAMINE**Threshold Limit Value**

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
MAK	AUS	5		10	INHAL
MAK	AUS		0,8		1,6

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VLEP	BEL	5				
MAK	CHE	5	20			INHAL
MAK	DEU	5	20			INHAL
TLV	DNK	3,1	0,5			
VLA	ESP	5				
HTP	FIN	5				
OEL	IRL	5				
OEL	NLD	5				
TLV	NOR	5				
MAK	SWE	5	0,8	10	1,6	SKIN
TLV-ACGIH		5				

POLYETHYLENGLYCOL**Threshold Limit Value**

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
MAK	CHE	1000			

BROMADIOLONE**Predicted no-effect concentration - PNEC**

Normal value in fresh water	1,7	mg/l
Normal value for fresh water sediment	0,83	mg/kg
Normal value of STP microorganisms	0,83	mg/l
Normal value for the terrestrial compartment	0,0084	mg/kg

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers			Effects on workers				
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral	0,0023 mg/kg/d		0,0012 mg/kg/d					

Legend:

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.

VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.

When choosing personal protective equipment, ask your chemical substance supplier for advice.

Personal protective equipment must be CE marked, showing that it complies with applicable standards.

Provide an emergency shower with face and eye wash station.

Exposure levels must be kept as low as possible to avoid significant build-up in the organism. Manage personal protective equipment so as to guarantee maximum protection (e.g. reduction in replacement times).

HAND PROTECTION

Protect hands with category III work gloves (see standard EN 374).

The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.

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The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

SKIN PROTECTION

Wear category III professional long-sleeved overalls and safety footwear (see Directive 89/686/EEC and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

EYE PROTECTION

Wear airtight protective goggles (see standard EN 166).

In the presence of risks of exposure to splashes or squirts during work, adequate mouth, nose and eye protection should be used to prevent accidental absorption.

RESPIRATORY PROTECTION

If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, use a mask with a type A filter whose class (1, 2 or 3) must be chosen according to the limit of use concentration. (see standard EN 14387). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.

Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.

If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus (in compliance with standard EN 137) or external air-intake breathing apparatus (in compliance with standard EN 138). For a correct choice of respiratory protection device, see standard EN 529.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Appearance	Fresh paste
Colour	dark red
Odour	characteristic
Odour threshold	Not available
pH	6,3-6,7 (1% aqueous dispersion @ 22 °C)
Melting point / freezing point	Not available
Initial boiling point	Not available
Boiling range	Not available
Flash point	Not available
Evaporation Rate	Not available
Flammability of solids and gases	not flammable
Lower inflammability limit	Not available
Upper inflammability limit	Not available
Lower explosive limit	Not available
Upper explosive limit	Not available
Vapour pressure	Not available
Vapour density	Not available
Relative density	1,18-1,22
Solubility	not applicable
Partition coefficient: n-octanol/water	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Explosive properties	Not explosive
Oxidising properties	Not oxidant

9.2. Other information

VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0

**MK180207 - RATIBROM 2 PASTE****SECTION 10. Stability and reactivity****10.1. Reactivity**

There are no particular risks of reaction with other substances in normal conditions of use.

1,2-PROPANEDIOL

Hygroscopic. Stable in normal conditions of use and storage.

At high temperatures it tends to oxidate to form propionaldehyde and lactic and acetic acid.

POLYETHYLENGLYCOL

Decomposes slowly at high temperatures in the presence of air.

2-BROMO-2-NITROPROPAN-1,3-DIOL

Decomposes on contact with: water, metals, strong bases.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

1,2-PROPANEDIOL

May react dangerously with: acid chlorides, acid anhydrides, oxidising agents.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

POLYETHYLENGLYCOL

Avoid contact with: oxidising agents, concentrated inorganic acids.

2-BROMO-2-NITROPROPAN-1,3-DIOL

Avoid exposure to: light, UV rays, moisture.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products**1,2-PROPANEDIOL**

May develop: carbon oxides.

2-BROMO-2-NITROPROPAN-1,3-DIOL

May develop: nitric oxide, carbon oxides, hydrobromic acid.

SECTION 11. Toxicological information

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using

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the criteria specified in the applicable regulation for classification.

It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

11.1. Information on toxicological effectsMetabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture: Not classified (no significant component)

LD50 (Oral) of the mixture: Not classified (no significant component)

LD50 (Dermal) of the mixture: Not classified (no significant component)

BROMADIOLONE

LD50 (Oral) 0,56 mg/kg Rat

LD50 (Dermal) 1,71 mg/kg Rat

LC50 (Inhalation) 0,00043 mg/l/4h

TRIETHANOLAMINE

LD50 (Oral) 4190 mg/kg Rat

LD50 (Dermal) > 2000 mg/kg Rabbit

1,2-PROPANEDIOL

LD50 (Oral) 20800 mg/kg Rat

LD50 (Dermal) 20800 mg/kg Rat

**MK180207 - RATIBROM 2 PASTE**SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

May damage the unborn child

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Causes damage to organs

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

No specific data are available for this product. Handle it according to good working practices. Avoid littering. Do not contaminate soil and waterways. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation. Please take all the proper measures to reduce harmful effects on aquifers.

12.1. Toxicity

BROMADIOLONE

LC50 - for Fish	0,8 mg/l/96h
EC50 - for Crustacea	2 mg/l/48h
EC50 - for Algae / Aquatic Plants	1 mg/l/72h

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2-BROMO-2-NITROPROPAN-1,3-DIOL

LC50 - for Fish

20 mg/l/96h *Oncorhynchus mykiss*

EC50 - for Crustacea

1,6 mg/l/48h *Daphnia magna***12.2. Persistence and degradability**

POLYETHYLENGLYCOL

Solubility in water

> 10000 mg/l

TRIETHANOLAMINE

Solubility in water

> 1000000 mg/l

Rapidly degradable

2-BROMO-2-NITROPROPAN-1,3-DIOL

Solubility in water

286000 mg/l

Rapidly degradable

1,2-PROPANEDIOL

Solubility in water

1000 - 10000 mg/l

Rapidly degradable

12.3. Bioaccumulative potential

POLYETHYLENGLYCOL

Partition coefficient: n-octanol/water

-2,2972

BCF

3,2

TRIETHANOLAMINE

Partition coefficient: n-octanol/water

-1,75

BCF

< 3,9

2-BROMO-2-NITROPROPAN-1,3-DIOL

Partition coefficient: n-octanol/water

0,22

BCF

3,16

1,2-PROPANEDIOL

Partition coefficient: n-octanol/water

-1,07

BCF

0,09

12.4. Mobility in soil

POLYETHYLENGLYCOL

Partition coefficient: soil/water

1

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TRIETHANOLAMINE

Partition coefficient: soil/water 1

1,2-PROPANEDIOL

Partition coefficient: soil/water 0,46

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations**13.1. Waste treatment methods**

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.

Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

CONTAMINATED PACKAGING

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable



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14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

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

Information not relevant

SECTION 15. Regulatory information

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

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006

Product

Point 3

Contained substance

Point 30 BROMADIOLONE

Substances in Candidate List (Art. 59 REACH)

On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)

None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:

None

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None

Substances subject to the Stockholm Convention:

None

Healthcare controls

Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.

15.2. Chemical safety assessment

No chemical safety assessment has been processed for the mixture and the substances it contains.

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Repr. 1B	Reproductive toxicity, category 1B
Acute Tox. 1	Acute toxicity, category 1
Acute Tox. 4	Acute toxicity, category 4
STOT RE 1	Specific target organ toxicity - repeated exposure, category 1
Eye Dam. 1	Serious eye damage, category 1
Eye Irrit. 2	Eye irritation, category 2
Skin Irrit. 2	Skin irritation, category 2
STOT SE 3	Specific target organ toxicity - single exposure, category 3
Aquatic Acute 1	Hazardous to the aquatic environment, acute toxicity, category 1
Aquatic Chronic 1	Hazardous to the aquatic environment, chronic toxicity, category 1
H360D	May damage the unborn child.
H300	Fatal if swallowed.
H310	Fatal in contact with skin.
H330	Fatal if inhaled.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H372	Causes damage to organs through prolonged or repeated exposure.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H335	May cause respiratory irritation.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road



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- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
 2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
 3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
 4. Regulation (EU) 2015/830 of the European Parliament
 5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
 6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
 7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
 8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
 9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
 10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
 11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
 12. Regulation (EU) 2016/1179 (IX Atp. CLP)
 13. Regulation (EU) 2017/776 (X Atp. CLP)
- The Merck Index. - 10th Edition
 - Handling Chemical Safety
 - INRS - Fiche Toxicologique (toxicological sheet)
 - Patty - Industrial Hygiene and Toxicology
 - N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
 - IFA GESTIS website
 - ECHA website
 - Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:

The following sections were modified:

03 / 04 / 08 / 10 / 11 / 12 / 16.