

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



0010LC MICROMAX TM RESISTOR PASTE

Version	Revision Date:	SDS Number:	Date of last issue: -
1.0	2024/09/27	300010001675	Date of first issue: 2024/09/27

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : 0010LC MICROMAX TM RESISTOR PASTE
Product code : 000000000021056586

Manufacturer or supplier's details

Company : Celanese (Shanghai) International Trading Co., Ltd
Address : 4560 Jinke Road, Zhangjiang, Pudong
Shanghai, China 201210
Telephone : 86-21-38619288
Emergency telephone : CHEMTREC International phone number: +1-703-527 3887,
+86 532 8388-9090 (China, 24h)
E-mail address : HazCom@celanese.com

Recommended use of the chemical and restrictions on use

Recommended use : For industrial use only.
Paste for electronic industry

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance : viscous liquid
Color : black
Odor : pine

Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation.
Suspected of causing genetic defects. Suspected of causing cancer. May damage fertility or the unborn child. May cause damage to organs (Blood) through prolonged or repeated exposure if swallowed. Very toxic to aquatic life with long lasting effects.

GHS Classification

Skin corrosion/irritation : Category 2
Serious eye damage/eye irritation : Category 2A
Skin sensitization : Category 1
Germ cell mutagenicity : Category 2
Carcinogenicity : Category 2
Reproductive toxicity : Category 1A
Specific target organ toxicity - repeated exposure (Oral) : Category 2 (Blood)

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Short-term (acute) aquatic hazard : Category 1

Long-term (chronic) aquatic hazard : Category 1

GHS label elements

Hazard pictograms : 

Signal Word : Danger

Hazard Statements : H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H341 Suspected of causing genetic defects.
H351 Suspected of causing cancer.
H360 May damage fertility or the unborn child.
H373 May cause damage to organs (Blood) through prolonged or repeated exposure if swallowed.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements : **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe mist or vapors.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P302 + P352 IF ON SKIN: Wash with plenty of water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P391 Collect spillage.
Storage:
P405 Store locked up.

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Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Physical and chemical hazards

Not classified based on available information.

Health hazards

Causes skin irritation. Causes serious eye irritation. May cause an allergic skin reaction. Suspected of causing genetic defects. Suspected of causing cancer. May damage fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure if swallowed.

Environmental hazards

Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Other hazards which do not result in classification

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
Terpineol	8000-41-7	20 -30
Silver powder (d50 < 1 mm)	7440-22-4	10 -20
Ruthenium (IV) oxide	12036-10-1	10 -20
Bisphenol A-epichlorohydrin resin	25068-38-6	1 -10
Palladium	7440-05-3	1 -10
Glass or Ceramic ingredient(s)		10 - 20%
Lead, Manganese		
Contains:	Lead	1 - 10 %
	Manganese	0.1 - 1 %

4. FIRST AID MEASURES

If inhaled : If inhaled, remove to fresh air.
If breathing is difficult, give oxygen.
If not breathing, give artificial respiration.
Get medical attention.

In case of skin contact : Wash off with soap and water.
Get medical attention if irritation develops and persists.
Wash contaminated clothing before re-use.

In case of eye contact : Immediately flush eyes for at least 15 minutes. Get medical attention.

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- | | |
|---|--|
| If swallowed | : If swallowed
Rinse mouth with water.
Call a physician or poison control center immediately.
DO NOT induce vomiting unless directed to do so by a physician or poison control center. |
| Most important symptoms and effects, both acute and delayed | : Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
Suspected of causing genetic defects.
Suspected of causing cancer.
May damage fertility or the unborn child.
May cause damage to organs through prolonged or repeated exposure if swallowed. |

5. FIRE-FIGHTING MEASURES

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

Dry chemical
Carbon dioxide (CO2) |
| Specific hazards during fire fighting | : Hazardous decomposition products formed under fire conditions.
(see also section 10)
Avoid breathing decomposition products. |
| Specific extinguishing methods | : Evacuate personnel to safe areas.
Stop spill/release if it can be done with minimal risk.
Do not allow run-off from fire fighting to enter drains or water courses. |
| Special protective equipment for fire-fighters | : Exposure to decomposition products may be a hazard to health.
Wear self-contained breathing apparatus for firefighting if necessary. |

6. ACCIDENTAL RELEASE MEASURES

- | | |
|---|---|
| Personal precautions, protective equipment and emergency procedures | : Avoid contact with skin, eyes and clothing.
Ensure adequate ventilation.
Wear suitable protective equipment. |
| Environmental precautions | : Prevent further leakage or spillage if safe to do so.
Prevent product from entering drains.
Clean contaminated floors and objects thoroughly while observing environmental regulations. |

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Methods and materials for containment and cleaning up : Contain spill.
Soak up with inert absorbent material.
Collect and contain contaminated absorbent and dike material for disposal.
Keep in suitable, closed containers for disposal.
Ventilate the area.
Clean contaminated surface thoroughly.

Prevention of secondary hazards : Dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Handling

Advice on protection against fire and explosion : Avoid formation of dust and aerosols.
Keep away from heat and sources of ignition.

Advice on safe handling : Avoid inhalation, ingestion and contact with skin and eyes.
Do not use in areas without adequate ventilation.
Keep container closed when not in use.
Take care to avoid waste and spillage when weighing, loading and mixing the product.

Avoidance of contact : Acids

Storage

Conditions for safe storage : Store in original container.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Keep away from sources of ignition - No smoking.
Do not store or consume food, drink or tobacco in areas where they may become contaminated with this material.
Keep container closed when not in use.
Do not reuse empty container.

Further information on storage stability : Stable under normal conditions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Silver powder (d50 < 1 mm)	7440-22-4	TWA (Dust and fume)	0.1 mg/m3	ACGIH
Lead	7439-92-1	PC-TWA (Dust)	0.05 mg/m3	CN OEL
Further information: G2B - Possibly carcinogenic to humans				

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		PC-TWA (Fumes)	0.03 mg/m3	CN OEL
	Further information: G2B - Possibly carcinogenic to humans			
Manganese	7439-96-5	PC-TWA	0.15 mg/m3 (MnO2)	CN OEL
		TWA (Inhalable particulate matter)	0.1 mg/m3 (Manganese)	ACGIH
		TWA (Respirable particulate matter)	0.02 mg/m3 (Manganese)	ACGIH

Engineering measures : Local exhaust or a laboratory hood should be used when handling the materials.
Maintain air concentrations below occupational exposure standards.

Personal protective equipment

Respiratory protection : Provide adequate ventilation.
No personal respiratory protective equipment normally required.
Where there is potential for airborne exposures in excess of applicable limits, wear approved respiratory protection with dust/mist cartridge.
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
Consult the respirator manufacturer to determine the appropriate type of equipment for a given application.
Observe respirator use limitations specified by the manufacturer.

Persons performing maintenance or repairs on exhaust system equipment (e.g. ducts) may need to use respirators and protective clothing to prevent exposure to any accumulated residues.

Eye/face protection : Wear safety glasses with side shields.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
Lightweight protective clothing
Safety shoes

Hand protection
Material : Impervious gloves

Remarks : Gloves must be inspected prior to use. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. The exact break through time can be

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obtained from the protective glove producer and this has to be observed. 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.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
Avoid contact with skin, eyes and clothing.
Contaminated work clothing should not be allowed out of the workplace.
Remove contaminated clothing and protective equipment before entering eating areas.
Remove and wash contaminated clothing before re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : viscous liquid

Color : black

Odor : pine

Flash point : 115 °C

Method: Setaflash closed cup - SCC

Density : 1.93 g/cm³

Solubility(ies)
Water solubility : slightly soluble (20 °C)

Oxidizing properties : The substance or mixture is not classified as oxidizing.
Not classified due to data which are conclusive although insufficient for classification.

10. STABILITY AND REACTIVITY

Possibility of hazardous reactions : Polymerization will not occur.
Stable at normal temperatures and storage conditions.

Conditions to avoid : None reasonably foreseeable.

Incompatible materials : Acids

Hazardous decomposition products : No decomposition if stored and applied as directed.
Under fire conditions:

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Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).
Metal oxides

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Not classified due to lack of data.

Product:

Acute oral toxicity : Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: > 10 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Components:

Terpineol:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 401
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : Remarks: No data available

Assessment: No data available

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Silver powder (d50 < 1 mm):

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 401
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 5.16 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 436
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal

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toxicity

Ruthenium (IV) oxide:

Acute oral toxicity	: LD50 (Rat): 4,580 mg/kg
Acute inhalation toxicity	: Assessment: No data available
Acute dermal toxicity	: Assessment: No data available

Lead:

Acute oral toxicity	: LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 401 Remarks: Information given is based on data obtained from similar substances.
Acute inhalation toxicity	: LC50 (Rat): > 5.05 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403 Remarks: Information given is based on data obtained from similar substances.

Bisphenol A-epichlorohydrin resin:

Acute oral toxicity	: LD50 (Rat): > 2,000 mg/kg Method: Fixed Dose Method Assessment: The substance or mixture has no acute oral toxicity
Acute inhalation toxicity	: Assessment: The substance or mixture has no acute inhalation toxicity Remarks: An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.
Acute dermal toxicity	: LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity

Manganese:

Acute oral toxicity	: LD50 (Rat): 9,000 mg/kg
Acute inhalation toxicity	: Remarks: No data available
Acute dermal toxicity	: Remarks: No data available

Skin corrosion/irritation

Causes skin irritation.

Components:

Terpineol:

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Species	:	Rabbit
Assessment	:	Irritating to skin.
Method	:	OECD Test Guideline 404
Result	:	Skin irritation

Silver powder (d50 < 1 mm):

Species	:	Rabbit
Assessment	:	No skin irritation
Method	:	OECD Test Guideline 404
Result	:	Slight or no skin irritation
Remarks	:	Minimal effects that do not meet the threshold for classification.

Lead:

Species	:	Rabbit
Assessment	:	Not classified as irritant
Method	:	OECD Test Guideline 404
Result	:	No skin irritation
Remarks	:	Information given is based on data obtained from similar substances.

Bisphenol A-epichlorohydrin resin:

Species	:	Rabbit
Assessment	:	Irritating to skin.
Result	:	Severe skin irritation

Manganese:

Remarks	:	No data available
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Serious eye damage/eye irritation

Causes serious eye irritation.

Components:

Terpineol:

Species	:	animals (unspecified species)
Result	:	Eye irritation
Assessment	:	Irritating to eyes.
Method	:	OECD Test Guideline 405

Silver powder (d50 < 1 mm):

Species	:	Rabbit
Result	:	No eye irritation
Assessment	:	No eye irritation
Method	:	OECD Test Guideline 405

Ruthenium (IV) oxide:

Species	:	Rabbit
Result	:	Slight or no eye irritation
Assessment	:	No eye irritation

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Method : OECD Test Guideline 405
Remarks : Minimal effects that do not meet the threshold for classification.

Lead:

Species : Rabbit
Result : No eye irritation
Assessment : Not classified as irritant
Method : OECD Test Guideline 405
Remarks : Information given is based on data obtained from similar substances.

Bisphenol A-epichlorohydrin resin:

Species : Rabbit
Result : Irritation to eyes, reversing within 7 days
Assessment : Mild eye irritation
Method : OECD Test Guideline 405

Manganese:

Remarks : No data available

Respiratory or skin sensitization

Skin sensitization

May cause an allergic skin reaction.

Respiratory sensitization

Not classified due to lack of data.

Components:

Terpineol:

Test Type : Maximization Test
Species : Guinea pig
Assessment : Not a skin sensitizer.
Method : OECD Test Guideline 406
Result : Did not cause sensitization on laboratory animals.

Silver powder (d50 < 1 mm):

Species : Guinea pig
Assessment : Does not cause skin sensitization.
Method : US EPA Test Guideline OPPTS 870.2600
Result : Does not cause skin sensitization.
Remarks : Information given is based on data obtained from similar substances.

Lead:

Species : Guinea pig
Assessment : Does not cause skin sensitization.
Method : OECD Test Guideline 406
Result : Does not cause skin sensitization.

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Remarks : Information given is based on data obtained from similar substances.

Bisphenol A-epichlorohydrin resin:

Species	: Mouse
Assessment	: May cause sensitization by skin contact.
Method	: OECD Test Guideline 429
Result	: May cause sensitization by skin contact.

Manganese:

Remarks : No data available

Germ cell mutagenicity

Suspected of causing genetic defects.

Components:

Terpineol:

Germ cell mutagenicity - Assessment	: Tests on bacterial or mammalian cell cultures did not show mutagenic effects., Evidence suggests this substance does not cause genetic damage in animals.
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Silver powder (d50 < 1 mm):

Germ cell mutagenicity - Assessment	: Weight of evidence does not support classification as a germ cell mutagen., Did not cause genetic damage in cultured bacterial cells., Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others., Genetic damage in animals was observed in some laboratory tests but not in others., Information given is based on data obtained from similar substances.
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Lead:

Germ cell mutagenicity - Assessment	: In vitro tests showed mutagenic effects, Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others.
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Bisphenol A-epichlorohydrin resin:

Germ cell mutagenicity - Assessment	: Animal testing did not show any mutagenic effects., Did not cause genetic damage in cultured bacterial cells., Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others.
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Carcinogenicity

Suspected of causing cancer.

Components:

Terpineol:

Carcinogenicity - Assessment	: Not classifiable as a human carcinogen., Overall weight of evidence indicates that the substance is not carcinogenic.
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Lead:

Carcinogenicity - Assessment : Suspected human carcinogens, An increased incidence of tumours was observed in laboratory animals., Information given is based on data obtained from similar substances.

Bisphenol A-epichlorohydrin resin:

Carcinogenicity - Assessment : Animal testing did not show any carcinogenic effects.

Reproductive toxicity

May damage fertility or the unborn child.

Components:

Terpineol:

Reproductive toxicity - Assessment : Animal testing showed effects on reproduction at levels equal to or above those causing parental toxicity.

Silver powder (d50 < 1 mm):

Reproductive toxicity - Assessment : No toxicity to reproduction, Animal testing showed no reproductive toxicity.
Animal testing showed no developmental toxicity.

Lead:

Reproductive toxicity - Assessment : Known human reproductive toxicant, Reduced fertility, Information given is based on data obtained from similar substances.
Delayed foetal development (variations), Information given is based on data obtained from similar substances.

Bisphenol A-epichlorohydrin resin:

Reproductive toxicity - Assessment : No toxicity to reproduction, Animal testing showed no reproductive toxicity., No effects on or via lactation
Animal testing showed no developmental toxicity.

STOT-single exposure

Not classified due to lack of data.

Components:

Terpineol:

Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

Silver powder (d50 < 1 mm):

Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

Lead:

Assessment : The substance or mixture is not classified as specific target

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organ toxicant, single exposure.

Bisphenol A-epichlorohydrin resin:

Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT-repeated exposure

May cause damage to organs (Blood) through prolonged or repeated exposure if swallowed.

Components:

Terpineol:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Silver powder (d50 < 1 mm):

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Bisphenol A-epichlorohydrin resin:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Components:

Terpineol:

Species : Rat
Application Route : Oral
Remarks : No toxicologically significant effects were found.

Silver powder (d50 < 1 mm):

Species : Rat
NOAEL : 30 mg/kg
LOAEL : 125 mg/kg
Application Route : Ingestion
Exposure time : 90 d
Method : OECD Test Guideline 408
Remarks : No toxicological effects warranting significant target organ toxicity classification were seen below the recommended guidance values for classification.

Species : Rat
Application Route : Inhalation
Test atmosphere : dust/mist
Exposure time : 90 d
Method : OECD Test Guideline 413
Remarks : No toxicological effects warranting significant target organ toxicity classification were seen below the recommended guidance values for classification.

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Lead:

Species	:	Rat
LOAEL	:	200
Application Route	:	Oral
Target Organs	:	Blood
Assessment	:	The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.
Remarks	:	altered blood chemistry Information given is based on data obtained from similar substances.

Bisphenol A-epichlorohydrin resin:

Species	:	Rat
NOAEL	:	> 1,000 mg/kg
Application Route	:	Ingestion
Exposure time	:	90 d
Method	:	OECD Test Guideline 408
Remarks	:	No toxicologically significant effects were found.

Species	:	Mouse
NOAEL	:	100 mg/kg
Application Route	:	Skin contact
Exposure time	:	90 d
Method	:	OECD Test Guideline 411
Remarks	:	No toxicologically significant effects were found.

Manganese:

Species	:	Human
Remarks	:	central nervous system effects

Aspiration toxicity

Not classified due to lack of data.

Components:

Silver powder (d50 < 1 mm):

No aspiration toxicity classification

Lead:

No aspiration toxicity classification

Bisphenol A-epichlorohydrin resin:

No aspiration toxicity classification

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12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Terpineol:

Toxicity to fish	:	LC50 (Danio rerio (zebra fish)): 62 - 80 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna (Water flea)): 73 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): 68 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 EbC50 (Pseudokirchneriella subcapitata (green algae)): 17 mg/l Exposure time: 72 h Method: OECD Test Guideline 201

Silver powder (d50 < 1 mm):

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 0.016 mg/l Exposure time: 96 h Remarks: Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.0125 mg/l Exposure time: 48 h Remarks: Information given is based on data obtained from similar substances.
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 0.19 mg/l Exposure time: 96 h Remarks: Information given is based on data obtained from similar substances. EC10 (Pseudokirchneriella subcapitata (green algae)): 0.03462 mg/l Exposure time: 72 h Remarks: Information given is based on data obtained from similar substances.
M-Factor (Acute aquatic toxicity)	:	10
Toxicity to fish (Chronic toxicity)	:	NOEC (Oncorhynchus mykiss (rainbow trout)): 0.0012 mg/l Exposure time: 32 d Remarks: Information given is based on data obtained from

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similar substances.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.00327 mg/l
Exposure time: 21 d
Remarks: Information given is based on data obtained from similar substances.

M-Factor (Chronic aquatic toxicity) : 10

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Ruthenium (IV) oxide:

Ecotoxicology Assessment

Acute aquatic toxicity : Toxic effects cannot be excluded

Lead:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 0.107 mg/l
Exposure time: 96 h
Remarks: Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Ceriodaphnia dubia (water flea)): 0.597 mg/l
Exposure time: 48 h
Remarks: Information given is based on data obtained from similar substances.

Toxicity to algae/aquatic plants : NOEC (algae): 0.0227 mg/l
Exposure time: 96 h
Remarks: Information given is based on data obtained from similar substances.

M-Factor (Acute aquatic toxicity) : 1

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)): 0.02 mg/l
Exposure time: 30 d
Remarks: Information given is based on data obtained from similar substances.

M-Factor (Chronic aquatic toxicity) : 1

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

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Bisphenol A-epichlorohydrin resin:

Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): 1.2 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 1.1 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	: ErC50 (Scenedesmus capricornutum (fresh water algae)): > 11 mg/l Exposure time: 72 h NOEC (Scenedesmus capricornutum (fresh water algae)): 4.2 mg/l Exposure time: 72 h
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC (Daphnia magna (Water flea)): 0.3 mg/l Exposure time: 21 d Method: OECD Test Guideline 211

Ecotoxicology Assessment

Acute aquatic toxicity	: Toxic to aquatic life.
Chronic aquatic toxicity	: Toxic to aquatic life with long lasting effects.

Manganese:

Toxicity to fish	: LC50 (Pimephales promelas (fathead minnow)): 30.6 mg/l
Toxicity to daphnia and other aquatic invertebrates	: LC50 (Daphnia magna (Water flea)): 19.2 mg/l Remarks: No data available
Toxicity to algae/aquatic plants	: Remarks: No data available

Persistence and degradability

Components:

Terpineol:

Biodegradability	: Biodegradation: 80 % Exposure time: 28 d Method: OECD Test Guideline 301 Remarks: Readily biodegradable.
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Silver powder (d50 < 1 mm):

Biodegradability	: Result: Not biodegradable Remarks: Not applicable
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Bisphenol A-epichlorohydrin resin:

Biodegradability	: Result: Not biodegradable Method: OECD Test Guideline 301
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Bioaccumulative potential

Components:

Terpineol:

Bioaccumulation : Bioconcentration factor (BCF): 24.13
Remarks: Bioaccumulation is unlikely.

Silver powder (d50 < 1 mm):

Bioaccumulation : Remarks: Bioaccumulation is unlikely.
Information given is based on data obtained from similar substances.

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

Bisphenol A-epichlorohydrin resin:

Bioaccumulation : Remarks: The substance has the potential to bioaccumulate.

Mobility in soil

No data available

Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : If recycling is not practicable, dispose of in compliance with local regulations.
Do not reuse empty container. Never place unused product down any indoor or out door drain.
Contaminated/not cleaned containers should be treated/handled like product waste. Dispose of container properly. Refer to applicable Local, State/Provincial, and Federal Regulations, as well as industry Standards.

14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Silver, Glass frits)
Class	:	9
Packing group	:	III
Labels	:	9
Environmentally hazardous	:	no

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IATA-DGR

UN/ID No.	: UN 3082
Proper shipping name	: Environmentally hazardous substance, liquid, n.o.s. (Silver, Glass frits)
Class	: 9
Packing group	: III
Labels	: Miscellaneous
Packing instruction (cargo aircraft)	: 964
Packing instruction (passenger aircraft)	: 964

IMDG-Code

UN number	: UN 3082
Proper shipping name	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Silver, Glass frits)
Class	: 9
Packing group	: III
Labels	: 9
EmS Code	: F-A, S-F
Marine pollutant	: no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation

GB 6944/12268

UN number	: UN 3082
Proper shipping name	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Silver, Glass frits)
Class	: 9
Packing group	: III
Labels	: 9
Marine pollutant	: no

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.

15. REGULATORY INFORMATION

National regulatory information

Law on the Prevention and Control of Occupational Diseases

Regulations on Safety Management of Hazardous Chemicals

Catalogue of Hazardous Chemicals : Not listed

Identification of Major Hazard Installations for Hazardous Chemicals (GB 18218) : Not listed

Hazardous Chemicals for Priority Management under : Not listed

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SAWS

Regulations on Occupational Labor Protection in the at workplaces where Toxic Substances Are Used

Catalogue of Highly Toxic Chemicals : Listed

Regulation of Environmental Management on the First Import of Chemicals and the Import and Export of Toxic Chemicals

China Severely Restricted Toxic Chemicals for Import and Export : Not listed

Regulation on the Administration of Precursor Chemicals

Catalogue and Classification of Precursor Chemicals : Not listed

16. OTHER INFORMATION

Revision Date : 2024/09/27

Date format : yyyy/mm/dd

Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)
CN OEL : Occupational exposure limits for hazardous agents in the workplace - Chemical hazardous agents.

ACGIH / TWA : 8-hour, time-weighted average
CN OEL / PC-TWA : Permissible concentration - time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); 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; ERG - Emergency Response Guide; 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; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National

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Toxicology Program; 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; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECl - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

Disclaimer

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.

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