2061 MICROMAX™ RESISTOR PASTE

Version	Revision Date:	SDS Number:	Date of last issue: 2024/09/25
8.1	2025/07/17	300000000137	Date of first issue: 2024/01/29

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : 2061 MICROMAX™ RESISTOR PASTE
Product code : 000000000027045682

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 number : 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
Colour : black
Odour : pine

Causes skin irritation. Causes serious eye irritation. Suspected of causing genetic defects. May cause cancer. May damage fertility or the unborn child. Causes 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

Germ cell mutagenicity : Category 2

Carcinogenicity : Category 1A

Reproductive toxicity : Category 1A

Specific target organ toxicity - repeated exposure (Oral) : Category 1 (Blood)

Short-term (acute) aquatic : Category 1

hazard

Long-term (chronic) aquatic hazard : Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H315 Causes skin irritation.
H319 Causes serious eye irritation.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H360 May damage fertility or the unborn child.
H372 Causes 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 vapours.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing 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.
P332 + P313 If skin irritation 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.

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. Suspected of causing genetic defects. May cause cancer. May damage fertility or the unborn child. Causes 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	>= 10 -< 20
Bis(2-butoxyethyl) ether	112-73-2	>= 10 -< 20
Ethyl cellulose	9004-57-3	>= 1 -< 10
Polyethylene oxide, mono(nonylphenyl) ether, branched, phosphate	68412-53-3	>= 1 -< 10
Quartz	14808-60-7	>= 0.1 -< 1
Nonylphenoxy(polyethoxy)ethanol, branched	68412-54-4	< 0.1

Glass or Ceramic ingredient(s) Lead, Silicon, Barium, Zirconium		60 - 70%
Contains:	Lead Silicon Barium Zirconium	30 - 40 % 1 - 10 % 1 - 10 % 1 - 10 %

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

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.
If swallowed	:	If swallowed Rinse mouth with water. Call a physician or poison control centre 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. Causes serious eye irritation. Suspected of causing genetic defects. May cause cancer. May damage fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure if swallowed.

5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Dry sand Dry chemical Alcohol-resistant foam
Specific hazards during firefighting	:	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 firefighters	:	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.

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. Use only with adequate ventilation/personal protection. 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

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Lead	7439-92-1	PC-TWA (Dust)	0.05 mg/m3	CN OEL
	Further information: G2B - Possibly carcinogenic to humans			
		PC-TWA (Fumes)	0.03 mg/m3	CN OEL
	Further information: G2B - Possibly carcinogenic to humans			
		TWA	0.05 mg/m3 (Lead)	ACGIH
Zirconium	7440-67-7	PC-TWA	5 mg/m3 (Zirconium)	CN OEL

		PC-STEL	10 mg/m3 (Zirconium)	CN OEL
		TWA	5 mg/m3 (Zirconium)	ACGIH
		STEL	10 mg/m3 (Zirconium)	ACGIH
Quartz	14808-60-7	PC-TWA (Total dust)	0.5 mg/m3	CN OEL
	Further information: G1 - Carcinogenic to humans			
		PC-TWA (Respirable dust)	0.2 mg/m3	CN OEL
	Further information: G1 - Carcinogenic to humans			
		PC-TWA (Total dust)	0.7 mg/m3	CN OEL
	Further information: G1 - Carcinogenic to humans			
		PC-TWA (Respirable dust)	0.3 mg/m3	CN OEL
	Further information: G1 - Carcinogenic to humans			
		PC-TWA (Total dust)	1 mg/m3	CN OEL
	Further information: G1 - Carcinogenic to humans			
		PC-TWA (Respirable dust)	0.7 mg/m3	CN OEL
	Further information: G1 - Carcinogenic to humans			
		TWA (Respirable particulate matter)	0.025 mg/m3 (Silica)	ACGIH

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Lead	7439-92-1	Lead (Lead)	Blood	Any time after three weeks of exposure	2 micromol per litre	CN BEI
		Lead (Lead)	Blood	Any time after three weeks of exposure	400 µg/l	CN BEI
		Lead (Lead)	In blood	Not critical	200 µg/l	ACGIH BEI

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 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
Colour	:	black
Odour	:	pine

pH	:	No data available Substance/mixture is non-polar/aprotic.
Flash point	:	99 °C Method: closed cup
Density	:	2.16 g/cm³ (20 °C)
Solubility(ies) Water solubility	: :	 slightly soluble (20 °C)
Viscosity Viscosity, dynamic	: :	 > 100 Pa.s (25 °C)
Viscosity, kinematic	:	> 20.5 mm2/s (40 °C) estimated

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: 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:

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.

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

Silicon:

Acute oral toxicity : LD50 (Rat): 3,160 mg/kg

Acute inhalation toxicity : Remarks: No data available

Acute dermal toxicity : Remarks: No data available

Barium:

Acute oral toxicity : LD50 (Rat): 132 mg/kg
Target Organs: Cardio-vascular system
Symptoms: Cardiovascular system effects

Acute inhalation toxicity : Remarks: No data available

Acute dermal toxicity : Remarks: No data available

Polyethylene oxide, mono(nonylphenyl) ether, branched, phosphate:

Acute oral toxicity : LD50 (Rat): 4,450 mg/kg

Zirconium:

Acute oral toxicity : Remarks: No data available

Acute inhalation toxicity : Remarks: No data available

Acute dermal toxicity : Remarks: No data available

Quartz:

Acute oral toxicity : LD50 (Rat): > 11,000 mg/kg
Assessment: The substance or mixture has no acute oral tox-

icity

Nonylphenoxy(polyethoxy)ethanol, branched:

Acute oral toxicity : LD50 (Rat): 7,500 mg/kg
Method: OECD Test Guideline 401
Assessment: The substance or mixture has no acute oral toxicity

Skin corrosion/irritation

Causes skin irritation.

Components:

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.

Terpineol:

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

Bis(2-butoxyethyl) ether:

Species : Rabbit
Assessment : Not classified as irritant
Method : OECD Test Guideline 404
Result : No skin irritation

Silicon:

Remarks : No data available

Barium:

Species : animals (unspecified species)
Result : Mild skin irritation
Remarks : Irritant

Polyethylene oxide, mono(nonylphenyl) ether, branched, phosphate:

Species : Rabbit
Assessment : Irritating to skin.
Result : Severe skin irritation
Remarks : Information given is based on data obtained from similar substances.

Zirconium:

Remarks : No data available

Quartz:

Species : Rabbit
Assessment : No skin irritation
Result : No skin irritation

Nonylphenoxy(polyethoxy)ethanol, branched:

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.

Serious eye damage/eye irritation

Causes serious eye irritation.

Components:

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.

Terpineol:

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

Bis(2-butoxyethyl) ether:

Species : Rabbit
Result : No eye irritation
Assessment : Not classified as irritant
Method : OECD Test Guideline 405

Silicon:

Species : Rabbit
Remarks : slight irritation

Barium:

Species : Rabbit
Result : Severe eye irritation
Remarks : Irritant

Polyethylene oxide, mono(nonylphenyl) ether, branched, phosphate:

Species	:	Rabbit
Result	:	Risk of serious damage to eyes.
Assessment	:	Risk of serious damage to eyes.
Remarks	:	Information given is based on data obtained from similar substances.

Zirconium:

Remarks	:	No data available

Quartz:

Species	:	Rabbit
Result	:	Slight or no eye irritation
Assessment	:	No eye irritation
Remarks	:	Minimal effects that do not meet the threshold for classification.

Nonylphenoxy(polyethoxy)ethanol, branched:

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

Respiratory or skin sensitisation

Skin sensitisation

Not classified due to lack of data.

Respiratory sensitisation

Not classified due to lack of data.

Components:

Lead:

Species	:	Guinea pig
Assessment	:	Does not cause skin sensitisation.
Method	:	OECD Test Guideline 406
Result	:	Does not cause skin sensitisation.
Remarks	:	Information given is based on data obtained from similar substances.

Terpineol:

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

Bis(2-butoxyethyl) ether:

Species	:	Human

Assessment	:	Does not cause skin sensitisation.
Result	:	Does not cause skin sensitisation.
Remarks	:	Information given is based on data obtained from similar substances.

Silicon:

Remarks	:	No data available

Barium:

Remarks	:	No data available

Polyethylene oxide, mono(nonylphenyl) ether, branched, phosphate:

Species	:	Human
Assessment	:	Does not cause skin sensitisation.
Result	:	Does not cause skin sensitisation.
Remarks	:	Information given is based on data obtained from similar substances.

Zirconium:

Remarks	:	No data available

Quartz:

Species	:	Guinea pig
Assessment	:	Does not cause skin sensitisation.
Result	:	Does not cause skin sensitisation.

Nonylphenoxy(polyethoxy)ethanol, branched:

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

Germ cell mutagenicity

Suspected of causing genetic defects.

Components:

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.

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.

Bis(2-butoxyethyl) ether:

Germ cell mutagenicity - Assessment	:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects., Did not cause genetic damage in cultured mammalian cells., Did not cause genetic damage in cultured bacterial cells.

Ethyl cellulose:

Germ cell mutagenicity - Assessment	:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects., Did not cause genetic damage in cultured bacterial cells., Did not cause genetic damage in cultured mammalian cells., Animal testing did not show any mutagenic effects., Information given is based on data obtained from similar substances.

Quartz:

Germ cell mutagenicity - Assessment	:	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.

Nonylphenoxy(polyethoxy)ethanol, branched:

Germ cell mutagenicity - Assessment	:	In vitro tests did not show mutagenic effects, Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Carcinogenicity

May cause cancer.

Components:

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.

Terpineol:

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

Quartz:

Carcinogenicity - Assessment	:	Human carcinogen., An increased risk of cancer in humans has been shown in workplace-based studies.

Reproductive toxicity

May damage fertility or the unborn child.

Components:

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.

Terpineol:

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

Bis(2-butoxyethyl) ether:

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

Nonylphenoxy(polyethoxy)ethanol, branched:

Reproductive toxicity - Assessment : Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

STOT - single exposure

Not classified due to lack of data.

Components:

Lead:

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

Terpineol:

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

STOT - repeated exposure

Causes 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.

Bis(2-butoxyethyl) ether:

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

Quartz:

Target Organs : Lungs
Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.

Nonylphenoxy(polyethoxy)ethanol, branched:

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

Repeated dose toxicity

Components:

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.

Terpineol:

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

Bis(2-butoxyethyl) ether:

Species : Rat
NOAEL : 100 mg/kg
Application Route : Ingestion
Method : see user defined free text

Silicon:

Remarks : No data available

Barium:

Species : multiple species
Application Route : Oral
Remarks : kidney effects

Zirconium:

Remarks : No data available

Quartz:

Species : multiple species
Application Route : Inhalation
Test atmosphere : dust/mist

Nonylphenoxy(polyethoxy)ethanol, branched:

Species : Rat

Application Route	:	Ingestion
Exposure time	:	90 d
Method	:	OPPTS 870.3100
Remarks	:	No toxicological effects warranting significant target organ toxicity classification were seen below the recommended guidance values for classification. Information given is based on data obtained from similar substances.

Aspiration toxicity

Not classified due to lack of data.

Components:

Lead:

No aspiration toxicity classification

Ethyl cellulose:

No aspiration toxicity classification

Polyethylene oxide, mono(nonylphenyl) ether, branched, phosphate:

No aspiration toxicity classification

Quartz:

No aspiration toxicity classification

Nonylphenoxy(polyethoxy)ethanol, branched:

No aspiration toxicity classification

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

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.

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

Bis(2-butoxyethyl) ether:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 210 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 42.5 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 41.3 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Ecotoxicology Assessment

Acute aquatic toxicity : Harmful to aquatic life.

Chronic aquatic toxicity : This product has no known ecotoxicological effects.

Silicon:

Toxicity to fish : Remarks: No data available

Toxicity to daphnia and other aquatic invertebrates : Remarks: No data available

Toxicity to algae/aquatic plants : Remarks: No data available

Barium:

Toxicity to fish : Remarks: No data available

Toxicity to daphnia and other aquatic invertebrates : Remarks: No data available

Toxicity to algae/aquatic plants : Remarks: No data available

Polyethylene oxide, mono(nonylphenyl) ether, branched, phosphate:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 81 mg/l
Exposure time: 96 h

Ecotoxicology Assessment

Acute aquatic toxicity : Harmful to aquatic life.

Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

Zirconium:

Toxicity to fish : Remarks: No data available

Toxicity to daphnia and other aquatic invertebrates : Remarks: No data available

Toxicity to algae/aquatic plants : Remarks: No data available

Quartz:

Ecotoxicology Assessment

Acute aquatic toxicity : Toxic effects cannot be excluded

Nonylphenoxy(polyethoxy)ethanol, branched:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 0.218 mg/l
Exposure time: 96 h
Method: US EPA Test Guideline OPP 72-1
Remarks: Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.148 mg/l
Exposure time: 48 h

Method: ISO 6341
Remarks: Information given is based on data obtained from similar substances.

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): > 3.0 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 1.5 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity) : 1

Toxicity to fish (Chronic toxicity) : NOEC (Oncorhynchus mykiss (rainbow trout)): 0.006 mg/l
Exposure time: 91 d
Method: US EPA Test Guideline OPPTS 850.1400
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.

Persistence and degradability

Components:

Terpineol:

Biodegradability : Biodegradation: 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301
Remarks: Readily biodegradable.

Bis(2-butoxyethyl) ether:

Biodegradability : Result: rapidly biodegradable
Remarks: Information given is based on data obtained from similar substances.

Quartz:

Biodegradability : Result: Not biodegradable
Remarks: Not applicable

Nonylphenoxy(polyethoxy)ethanol, branched:

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

Remarks: Not readily biodegradable.

Bioaccumulative potential

Components:

Terpineol:

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

Bis(2-butoxyethyl) ether:

Partition coefficient: n-octanol/water : log Pow: 1.92

Ethyl cellulose:

Partition coefficient: n-octanol/water : log Pow: 5.5

Quartz:

Bioaccumulation : Remarks: Not applicable

Nonylphenoxy(polyethoxy)ethanol, branched:

Bioaccumulation : Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: 5.39 (20 °C)

Mobility in soil

No data available

Other adverse effects

Components:

Nonylphenoxy(polyethoxy)ethanol, branched:

Endocrine disrupting potential : The substance is considered to have endocrine disrupting properties according to REACH Article 57(f) for the environment.
Remarks: These substances cause probable serious effects to the environment based on their degradation to branched and linear forms of 4-Nonylphenol
Remarks: Studies have shown adverse effects on:
Reproductive function
Sexual development
Remarks: Species impacted:
Fish
Amphibians
Remarks: The mode of action linked to these adverse effects is considered to be due to:
Disruption of estrogenic signalling pathways

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. (Glass frits, Ceramic)
Class	:	9
Packing group	:	III
Labels	:	9
Environmentally hazardous	:	no

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Glass frits, Ceramic)
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. (Glass frits, Ceramic)
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.

National Regulations

GB 6944/12268

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

JT/T 617

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Class	:	9
Packing group	:	III
Labels	:	9
Environmentally hazardous	:	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	:	This product is not listed in the catalogue of hazardous chemicals and it does not meet the definition of hazardous chemicals and its principles of determination.
Identification of Major Hazard Installations for Hazardous Chemicals (GB 18218)	:	Not listed
Hazardous Chemicals for Priority Management under SAWS	:	Not listed
Catalogue of Specially Controlled Hazardous Chemicals	:	Not listed
List of Explosive Precursors	:	Listed

Regulations on Labour Protection in 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

Regulations on the Administration of Controlled Chemicals

List of Controlled Chemicals : Not listed

Regulations of Ozone Depleting Substances Management

List of Controlled Ozone Depleting Substances : Not listed

List of Controlled Ozone Depleting Substances Import and Export : Not listed

Environmental Protection Law

List of Priority Controlled Chemicals : Listed

List of Key Controlled New Pollutants : Not listed

16. OTHER INFORMATION

Revision Date : 2025/07/17
Date format : yyyy/mm/dd

Full text of other abbreviations

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

ACGIH / TWA : 8-hour, time-weighted average
ACGIH / STEL : Short-term exposure limit
CN OEL / PC-TWA : Permissible concentration - time weighted average
CN OEL / PC-STEL : Permissible concentration - short term exposure limit

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 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; TECI - 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.

CN / EN