

SAFETY DATA SHEET

according to the OSHA
Hazard Communication Standard

Version 6.22
Revision Date 07/14/2026
Print Date 07/15/2026

SECTION 1. IDENTIFICATION

1.1 Product identifiers

Product name : MISA Group 23 Chlorinated Hydrocarbon Mix

Product Number : 48136

Brand : Supelco

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

Identified uses : Research and development as defined in 40 C.F.R. § 751.403. See section 15 for more information.

Restrictions on use : For R&D use only. Not for pharmaceutical, household or other uses. The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma. After February 3, 2025, this chemical substance (as defined in TSCA section 3(2))/product cannot be distributed in commerce to retailers. After January 28, 2026, this chemical substance (as defined in TSCA section 3(2))/product is and can only be distributed in commerce or processed with a concentration of methylene chloride equal to or greater than 0.1% by weight for the following purposes: (1) Processing as a reactant; (2) Processing for incorporation into a formulation, mixture, or reaction product; (3) Processing for repackaging; (4) Processing for recycling; (5) Industrial or commercial use as a laboratory chemical; (6) Industrial or commercial use as a bonding agent for solvent welding; (7) Industrial and commercial use as a paint and coating remover from safety critical, corrosion-sensitive components of aircraft and spacecraft; (8) Industrial and commercial use as a processing aid; (9) Industrial and commercial use for plastic and rubber products manufacturing; (10) Industrial and commercial use as a solvent that becomes part of a formulation or mixture, where that formulation or mixture will be used inside a manufacturing process, and the solvent (methylene chloride) will be reclaimed; (11) Industrial and commercial use in the refinishing for wooden furniture, decorative pieces, and architectural fixtures of artistic, cultural

or historic value until May 8, 2029; (12) Industrial and commercial use in adhesives and sealants in aircraft, space vehicle, and turbine applications for structural and safety critical non-structural applications until May 8, 2029; (13) Disposal; and (14) Export.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Hazards for the product as supplied

Acute toxicity (Inhalation) : Category 3

Skin irritation : Category 2

Eye irritation : Category 2A

Carcinogenicity : Category 1B

Specific target organ toxicity - single exposure : Category 3 (Central nervous system)

Short-term (acute) aquatic hazard : Category 1

Long-term (chronic) aquatic hazard : Category 1

Other hazards

None known.

GHS label elements

Hazard pictograms :



Signal word	: Danger
Hazard statements	: H315 Causes skin irritation. H319 Causes serious eye irritation. H331 Toxic if inhaled. H336 May cause drowsiness or dizziness. H350 May cause cancer. 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. P261 Avoid breathing mist or vapours. P264 Wash skin thoroughly after handling. P271 Use only outdoors or in a well-ventilated area. 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 soap and water. P304 + P340 + P311 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor. 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 Take off contaminated clothing and wash before reuse. P391 Collect spillage. Storage: P403 + P233 Store in a well-ventilated place. Keep container tightly closed. P405 Store locked up. Disposal: P501 Dispose of contents/ container to an approved waste disposal plant.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture	: Mixture
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CAS-No. : Not Assigned

Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
Dichloromethane	75-09-2*	$\geq 80 - \leq 100$	TSC
Hexachloroethane	67-72-1*	$\geq 0.1 - \leq 1$	TSC
Hexachlorobenzene	118-74-1*	$\geq 0.1 - \leq 1$	TSC
1,2,3,4,5,5-Hexachlorocyclopentadiene	77-47-4*	$\geq 0.1 - \leq 1$	TSC
Hexachlorobuta-1,3-diene	87-68-3*	$\geq 0.1 - \leq 1$	TSC
1,2,3-trichlorobenzene	87-61-6*	$\geq 0.1 - \leq 1$	TSC
1,2,3,5-Tetrachlorobenzene	634-90-2*	$\geq 0.1 - \leq 1$	TSC
Pentachlorobenzene	608-93-5*	$\geq 0.1 - \leq 1$	TSC
1,2,4,5-Tetrachlorobenzene	95-94-3*	$\geq 0.1 - \leq 1$	TSC
1,2,3,4-Tetrachlorobenzol	634-66-2*	$\geq 0.1 - \leq 1$	TSC

* Indicates that the identifier is a CAS No.

TSC- the actual concentration or concentration range is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

- General advice : First aiders need to protect themselves.
Show this safety data sheet to the doctor in attendance.
- If inhaled : After inhalation: fresh air. Immediately call in physician.
If breathing stops: immediately apply artificial respiration, if necessary also oxygen.
- In case of skin contact : In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.
Consult a physician.
- In case of eye contact : After eye contact: rinse out with plenty of water.
Call in ophthalmologist.
Remove contact lenses.

If swallowed	: After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.
Most important symptoms and effects, both acute and delayed	: The most important known symptoms and effects are described in the labelling (see section 2 GHS label elements) and/or in section 11
Protection of first-aiders	: For personal protection see section 8.
Notes to physician	: No data available

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	: For this substance/mixture no limitations of extinguishing agents are given.
Specific hazards during fire fighting	: Not combustible. Ambient fire may liberate hazardous vapours.
Hazardous combustion products	: Carbon oxides Hydrogen chloride gas
Specific extinguishing methods	: No data available
Further information	: Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for fire-fighters	: Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURES

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Personal precautions, protective equipment and emergency procedures	: Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert. Advice for emergency responders: Wear appropriate personal protective equipment, as indicated in Section 8.
Environmental precautions	: Do not let product enter drains.
Methods and materials for containment and cleaning up	: Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

SECTION 7. HANDLING AND STORAGE

For precautions see section 2 GHS label elements

Advice on safe handling	: Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.
Further information on storage conditions	: Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorised persons.
Storage class	: 6.1D, Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects
Recommended storage temperature	: Recommended storage temperature see product label.
Further information on storage stability	: Heat sensitive.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of	Control parameters /	Basis
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		exposure)	Permissible concentration	
Dichloromethane	75-09-2	TWA	50 ppm	ACGIH
		PEL	25 ppm	OSHA CARC
		STEL	125 ppm	OSHA CARC
		ECEL-TWA	2 ppm 8 mg/m ³	TSCA ECEL
		EPA STEL	16 ppm 57 mg/m ³	TSCA ECEL
Hexachloroethane	67-72-1	TWA	1 ppm	ACGIH
		TWA	1 ppm 10 mg/m ³	NIOSH REL
		TWA	1 ppm 10 mg/m ³	OSHA Z-1
Hexachlorobenzene	118-74-1	TWA	0.002 mg/m ³	ACGIH
1,2,3,4,5,5-Hexachlorocyclopentadiene	77-47-4	TWA	0.01 ppm	ACGIH
		TWA	0.01 ppm 0.1 mg/m ³	NIOSH REL
Hexachlorobuta-1,3-diene	87-68-3	TWA	0.02 ppm	ACGIH
		TWA	0.02 ppm 0.24 mg/m ³	NIOSH REL

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Dichloromethane	75-09-2	Dichloromethane	Urine	End of shift (As soon as possible after exposure ceases)	0.3 mg/l	ACGIH BEI

Engineering measures : No data available

Personal protective equipment

Respiratory protection : required when vapours/aerosols are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection

system.

Recommended Filter type: Filter type ABEK

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Hand protection

Remarks : required

Eye protection : Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Safety glasses

Skin and body protection : protective clothing

Hygiene measures : Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Colour : No data available

Odour : No data available

Odour Threshold : No data available
pH : No data available

Melting point : No data available

Boiling point/boiling range : No data available

Flash point : No data available

Evaporation rate : No data available

Flammability (solid, gas) : No data available

Flammability (liquids) : The product is not flammable.

Burning rate	: No data available
Self-ignition	: Not applicable
Upper explosion limit / Upper flammability limit	: Not applicable
Lower explosion limit / Lower flammability limit	: Not applicable
Vapour pressure	: No data available
Relative vapour density	: No data available
Relative density	: No data available
Density	: No data available
Water solubility	: No data available
Partition coefficient: n- octanol/water	: No data available
Autoignition temperature	: Not applicable
Decomposition temperature	: No data available
Viscosity, dynamic	: No data available
Viscosity, kinematic	: No data available
Flow time	: No data available
Explosive properties	: Not classified as explosive.
Oxidizing properties	: none
Particle characteristics Particle size	: No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No data available
Chemical stability	: The product is chemically stable under standard ambient conditions (room temperature) .
Possibility of hazardous reactions	: Violent reactions possible with:

Conditions to avoid	: no information available
Incompatible materials	: Dimethylformamide Strong bases Bases Oxidizing agents Alkali metals Strong acids and strong bases Strong oxidizing agents Amines Vinyl compounds acids Aluminum Magnesium
Hazardous decomposition products	: In the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Mixture

Acute toxicity

Oral: No data available

Acute toxicity estimate Oral - 2,356 mg/kg
(Calculation method)

Symptoms: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract.

Inhalation: No data available

Acute toxicity estimate Inhalation - 4 h - 9 mg/l - vapour (Calculation method)

Symptoms: Possible symptoms: , mucosal irritations

Dermal: No data available

Acute toxicity estimate Dermal - 2,355 mg/kg
(Calculation method)

Skin corrosion/irritation

Remarks: Mixture causes skin irritation.

Serious eye damage/eye irritation

Remarks: Mixture causes serious eye irritation.

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

Possible carcinogen.

IARC: 2A - Group 2A: Probably carcinogenic to humans (Dichloromethane)
IARC: 2B - Group 2B: Possibly carcinogenic to humans (Hexachloroethane)
IARC: 2B - Group 2B: Possibly carcinogenic to humans (Hexachlorobenzene)
NTP: RAHC - Reasonably anticipated to be a human carcinogen (Dichloromethane)
NTP: RAHC - Reasonably anticipated to be a human carcinogen (Hexachloroethane)
NTP: RAHC - Reasonably anticipated to be a human carcinogen (Hexachlorobenzene)
OSHA: OSHA specifically regulated carcinogen (Dichloromethane)

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

Mixture may cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

11.2 Additional Information

Dichloromethane is metabolized in the body producing carbon monoxide which increases and sustains carboxyhemoglobin levels in the blood, reducing the oxygen-carrying capacity of the blood., Acts as a simple asphyxiant by displacing air., anesthetic effects, Breathing difficulties, Headache, Dizziness, Prolonged or repeated contact with skin may cause:, defatting, Dermatitis, Contact with eyes can cause:, Redness, Blurred vision, Provokes tears.

Other dangerous properties can not be excluded.

This substance should be handled with particular care.

Handle in accordance with good industrial hygiene and safety practice.

Stomach - Irregularities - Based on Human Evidence

Components

Dichloromethane

Acute toxicity

LD50 Oral - Rat - male and female - > 2,000 mg/kg
(OECD Test Guideline 401)

LC50 Inhalation - Mouse - 4 h - 86 mg/l - vapour

Remarks: (ECHA)

Symptoms: Possible damages:, mucosal irritations

LD50 Dermal - Rat - male and female - > 2,000 mg/kg
(OECD Test Guideline 402)

Skin corrosion/irritation

Skin - Rabbit

Result: Irritations - 4 h

(OECD Test Guideline 404)

Remarks: Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Eye irritation

Remarks: (ECHA)

Remarks: Risk of corneal clouding.

Respiratory or skin sensitization

Local lymph node assay (LLNA) - Mouse

Result: negative

(OECD Test Guideline 429)

Germ cell mutagenicity

Test Type: Mutagenicity (mammal cell test): chromosome aberration.

Test system: Chinese hamster ovary cells

Result: positive

Test Type: Ames test

Test system: Salmonella typhimurium

Result: positive

Method: OECD Test Guideline 474

Species: Mouse - male and female - Bone marrow

Result: negative

Carcinogenicity

Suspected of causing cancer.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

Inhalation - May cause drowsiness or dizziness. - Central nervous system

Acute inhalation toxicity - Possible damages: , mucosal irritations

Specific target organ toxicity - repeated exposure

Aspiration hazard

No data available

Hexachloroethane

Acute toxicity

LD50 Oral - Rat - 4,460 mg/kg

Remarks: (RTECS)

Inhalation: No data available

LD50 Dermal - Rabbit - 32,000 mg/kg

Remarks: (RTECS)

Skin corrosion/irritation

Skin - reconstructed human epidermis (RhE)

Result: No skin irritation - 1 h

(OECD Test Guideline 439)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Irritating to eyes. - 24 h

Remarks: (ECHA)

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

Suspected of causing cancer.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Hexachlorobenzene

Acute toxicity

LD50 Oral - Rat - 10,000 mg/kg

LD50 Oral - Mouse - 4,000 mg/kg

LD50 Oral - Cat - 1,700 mg/kg

LD50 Oral - Rabbit - 2,600 mg/kg

LD50 Oral - Guinea pig - > 3,000 mg/kg

LD50 Oral - Quail - > 6,400 mg/kg

LD50 Oral - Mammal - > 5,000 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity).

Behavioral:Change in motor activity (specific assay).

LC50 Inhalation - Rat - 3,600 mg/m3 - dust/mist

LC50 Inhalation - Mouse - 4,000 mg/m3 - dust/mist

LC50 Inhalation - Cat - 1,600 mg/m3 - dust/mist

LC50 Inhalation - Rabbit - 1,800 mg/m3 - dust/mist

Dermal: No data available

No data available

Skin corrosion/irritation

Remarks: No data available

Serious eye damage/eye irritation

Remarks: No data available

Respiratory or skin sensitization

Causes photosensitivity. Exposure to light can result in allergic reactions resulting in dermatologic lesions, which can vary from sunburnlike responses to edematous, vesiculated lesions, or bullae

Germ cell mutagenicity

No data available

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

Ingestion - Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard

No data available

1,2,3,4,5,5-Hexachlorocyclopentadiene**Acute toxicity**

LD50 Oral - Rat - male and female - 1,400 mg/kg

(OECD Test Guideline 401)

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

LC50 Inhalation - Rat - male - 4.0 h - 0.018 mg/l - vapour

(OECD Test Guideline 403)

LD50 Dermal - Rabbit - 430.0 mg/kg

Remarks: (RTECS)

Skin corrosion/irritation

Skin - Rabbit

Result: Severe skin irritation - 4 h

Remarks: (RTECS)

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Causes serious eye damage.

(OECD Test Guideline 405)

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

Method: OECD Test Guideline 478

Species: Mouse - male and female

Result: negative

Carcinogenicity

No data available

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

Aspiration hazard

No data available

Hexachlorobuta-1,3-diene

Acute toxicity

LD50 Oral - Rat - 82.0 mg/kg

LC50 Inhalation - Mouse - 370.0 mg/m³ - dust/mist

LD50 Dermal - Rabbit - 100.0 mg/kg

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: Skin irritation - 24 h

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Mild eye irritation

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Suspected of causing cancer.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

1,2,3-trichlorobenzene

Acute toxicity

LD50 Oral - Rat - male and female - > 5,000 mg/kg

(OECD Test Guideline 401)

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: negative

(OECD Test Guideline 404)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: slight irritation

(OECD Test Guideline 405)

Respiratory or skin sensitization

Local lymph node assay (LLNA) - Mouse

Result: positive

(OECD Test Guideline 429)

Germ cell mutagenicity

No data available

Test Type: Ames test

Test system: Salmonella typhimurium

Result: negative

Carcinogenicity

No data available

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

1,2,3,5-Tetrachlorobenzene

Acute toxicity

LD50 Oral - Rat - 1,727 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity).

Diarrhoea

Nutritional and Gross Metabolic:Changes in:Body temperature decrease.

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

Remarks: No data available

Serious eye damage/eye irritation

Remarks: No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Pentachlorobenzene

Acute toxicity

LD50 Oral - Rat - 1,080 mg/kg

Remarks: Behavioral:General anesthetic.

Behavioral:Tremor.

Inhalation: No data available

LD50 Dermal - Rat - > 2,500 mg/kg

No data available

Skin corrosion/irritation

Remarks: No data available

Serious eye damage/eye irritation

Remarks: No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

1,2,4,5-Tetrachlorobenzene**Acute toxicity**

LD50 Oral - Rat - 1,500 mg/kg

Remarks: Behavioral:General anesthetic.

Behavioral:Somnolence (general depressed activity).

Behavioral:Convulsions or effect on seizure threshold.
(RTECS)

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

1,2,3,4-Tetrachlorbenzol**Acute toxicity**

LD50 Oral - Rat - 1,167 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity).

Diarrhoea

Nutritional and Gross Metabolic:Changes in:Body temperature decrease.

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

Remarks: No data available

Serious eye damage/eye irritation

Remarks: No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Dichloromethane:

Toxicity to fish	: LC50 (Pimephales promelas (fathead minnow)): 193.00 mg/l End point: mortality Exposure time: 96 h Test Type: flow-through test Analytical monitoring: yes Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	: LC50 (Daphnia magna (Water flea)): 27 mg/l End point: mortality Exposure time: 48 h Test Type: static test Method: US-EPA
Toxicity to fish (Chronic toxicity)	: LC50 (Pimephales promelas (fathead minnow)): 471 mg/l End point: mortality Exposure time: 8 d

Test Type: flow-through test
Analytical monitoring: yes
Remarks: (ECHA)

Toxicity to microorganisms : EC50 (activated sludge): 2,590 mg/l
Exposure time: 40 min
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 209

Hexachloroethane:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 0.84 mg/l
Exposure time: 96 h
Remarks: (ECOTOX Database)

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 1.36 mg/l
Exposure time: 48 h
Remarks: (ECOTOX Database)

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata): 0.88 mg/l
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity) : 1

M-Factor (Chronic aquatic toxicity) : 1

Hexachlorobenzene:

Toxicity to fish : LC50 (Lepomis macrochirus (Bluegill)): 7.6 mg/l
Exposure time: 96.0 h

NOEC (Pimephales promelas (fathead minnow)): > 0.0048 mg/l
Exposure time: 96.0 h

LC50 : 0.1 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 0.005 mg/l
Exposure time: 48 h
Test Type: Immobilization

M-Factor (Acute aquatic toxicity) : 100

1,2,3,4,5,5-Hexachlorocyclopentadiene:

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Toxicity to fish : LC50 (*Lepomis macrochirus* (Bluegill)): 0.13 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (*Daphnia magna* (Water flea)): 0.04 mg/l
End point: mortality
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202

M-Factor (Acute aquatic toxicity) : 100

M-Factor (Chronic aquatic toxicity) : 10

Hexachlorobuta-1,3-diene:

Toxicity to fish : LC50 (*Pimephales promelas* (fathead minnow)): 0.09 mg/l
End point: mortality
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (*Daphnia* (water flea)): 0.5 mg/l
Exposure time: 24 h

Toxicity to fish (Chronic toxicity) : LOEC (*Pimephales promelas* (fathead minnow)): 0.013 mg/l
Exposure time: 28 d

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

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

1,2,3-trichlorobenzene:

Toxicity to fish : LC50 (*Gambusia affinis* (Mosquito fish)): 2.2 mg/l
Exposure time: 96.0 h

LC50 : 2 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (*Daphnia magna* (Water flea)): 1.45 mg/l
Exposure time: 48 h
Test Type: Immobilization

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

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

1,2,3,5-Tetrachlorobenzene:

Toxicity to fish : LC50 (*Lepomis macrochirus*): 1.6 mg/l
Exposure time: 96 h

NOEC (*Cyprinodon variegatus* (sheepshead minnow)):
1 mg/l
Exposure time: 96 h
Test Type: mortality

Toxicity to daphnia and other aquatic invertebrates : EC50 (*Daphnia magna* (Water flea)): 0.86 mg/l
Exposure time: 48 h

M-Factor (Acute aquatic toxicity) : 1

Pentachlorobenzene:

Toxicity to fish : LC50 (*Pimephales promelas* (fathead minnow)): 0.247 mg/l
Exposure time: 96.0 h

LC50 : 0.1 mg/l
Exposure time: 96 h

M-Factor (Acute aquatic toxicity) : 10

Toxicity to fish (Chronic toxicity) : LOEC (*Cyprinodon variegatus* (sheepshead minnow)):
0.052 mg/l
Exposure time: 28 d
Test Type: mortality

NOEC (*Pimephales promelas* (fathead minnow)): >
0.055 mg/l
Exposure time: 31 d
Test Type: mortality

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : LC50 (*Daphnia magna* (Water flea)): 0.24 mg/l
Exposure time: 21 d

LOEC (*Daphnia magna* (Water flea)): 0.18 mg/l
Exposure time: 21 d
Test Type: mortality

M-Factor (Chronic aquatic : 1
toxicity)

1,2,4,5-Tetrachlorobenzene:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 0.32
mg/l
Exposure time: 96 h
Remarks: (ECOTOX Database)

Toxicity to daphnia and : LC50 (Daphnia magna (Water flea)): > 530 mg/l
other aquatic
invertebrates Exposure time: 48 h
Remarks: (ECOTOX Database)

Toxicity to algae/aquatic : IC50 (Pseudokirchneriella subcapitata (green algae)):
plants 47 mg/l
Exposure time: 96 h
Remarks: (above the solubility limit in the test
medium)
(ECOTOX Database)

M-Factor (Acute aquatic : 1
toxicity)

Toxicity to fish (Chronic : LOEC (Jordanella floridae): > 0.238 mg/l
toxicity) Exposure time: 10 d
Test Type: mortality
Remarks: (ECOTOX Database)

M-Factor (Chronic aquatic : 1
toxicity)

1,2,3,4-Tetrachlorbenzol:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 1.1
mg/l
Exposure time: 96 h

Toxicity to daphnia and : EC50 (Daphnia (water flea)): 0.13 mg/l
other aquatic
invertebrates Exposure time: 48 h

M-Factor (Acute aquatic : 1
toxicity)

Toxicity to fish (Chronic : NOEC (Pimephales promelas (fathead minnow)): 0.25
toxicity) mg/l
Exposure time: 33 d
Test Type: mortality

LOEC (Pimephales promelas (fathead minnow)): 0.41

mg/l
Exposure time: 33 d
Test Type: mortality

Persistence and degradability

Components:

Dichloromethane:

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Concentration: 5 mg/l
Result: Readily biodegradable.
Biodegradation: 68 %
Exposure time: 28 d
Method: OECD Test Guideline 301D
GLP: yes

Hexachloroethane:

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

Hexachlorobenzene:

Biodegradability : Remarks: No data available

Hexachlorobuta-1,3-diene:

Biodegradability : Remarks: No data available

1,2,3-trichlorobenzene:

Biodegradability : Remarks: No data available

Pentachlorobenzene:

Biodegradability : Remarks: No data available

Bioaccumulative potential

Components:

Dichloromethane:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 2 - 5.4
Exposure time: 6 Weeks
Concentration: 250 µg/l
Method: OECD Test Guideline 305
GLP: yes

Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 6 - 40
Exposure time: 6 Weeks

Concentration: 25 µg/l
Method: OECD Test Guideline 305
GLP: yes

Partition coefficient: n-octanol/water : log Pow: 1.25 (68 °F / 20 °C)
pH: 7
Method: (experimental)
Remarks: Bioaccumulation is not expected.

Hexachloroethane:

Bioaccumulation : Species: *Lepomis macrochirus* (Bluegill)
Bioconcentration factor (BCF): 139
Exposure time: 28 d
Concentration: 0.00617 mg/l

Hexachlorobenzene:

Bioaccumulation : Species: *Pimephales promelas* (fathead minnow)
Bioconcentration factor (BCF): 22,000
Exposure time: 32 d
Concentration: 0.0003 mg/l

1,2,3,4,5,5-Hexachlorocyclopentadiene:

Bioaccumulation : Species: *Pimephales promelas* (fathead minnow)
Bioconcentration factor (BCF): < 11
Exposure time: 30 d
Temperature: 77 °F / 25 °C
Concentration: 0.007 mg/l
Method: OECD Test Guideline 305

Hexachlorobuta-1,3-diene:

Bioaccumulation : Remarks: No data available

1,2,3-trichlorobenzene:

Bioaccumulation : Species: *Oncorhynchus mykiss* (rainbow trout)
Bioconcentration factor (BCF): 710
Exposure time: 48 h
Concentration: 0.0096 mg/l

Partition coefficient: n-octanol/water : log Pow: 4.016

1,2,3,5-Tetrachlorobenzene:

Bioaccumulation : Species: *Poecilia reticulata* (guppy)
Bioconcentration factor (BCF): 72,000
Exposure time: 19 d
Concentration: 12 µg/l

Pentachlorobenzene:

Bioaccumulation : Species: Pimephales promelas (fathead minnow)
Bioconcentration factor (BCF): 8,400
Exposure time: 31 d
Concentration: 79.8 µg/l

1,2,4,5-Tetrachlorobenzene:

Bioaccumulation : Species: Jordanella floridae
Bioconcentration factor (BCF): 4,050
Exposure time: 28 d
Concentration: 3.02 µg/l

Partition coefficient: n- : log Pow: 4.60
octanol/water

1,2,3,4-Tetrachlorbenzol:

Bioaccumulation : Species: Pimephales promelas (fathead minnow)
Bioconcentration factor (BCF): 2,400
Exposure time: 33 d
Concentration: 215 µg/l

Mobility in soil**Components:****Hexachlorobenzene:**

Stability in soil : Remarks: No data available

Hexachlorobuta-1,3-diene:

Stability in soil : Remarks: No data available

1,2,3-trichlorobenzene:

Stability in soil : Remarks: No data available

1,2,3,5-Tetrachlorobenzene:

Stability in soil : Remarks: No data available

Pentachlorobenzene:

Stability in soil : Remarks: No data available

1,2,3,4-Tetrachlorbenzol:

Stability in soil : Remarks: No data available

Other adverse effects**Product:**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Components:

Dichloromethane:

Results of PBT and vPvB assessment : Not persistent, bioaccumulative, and toxic (PBT). Not very persistent and very bioaccumulative (vPvB).

: Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

Hexachlorobuta-1,3-diene:

Results of PBT and vPvB assessment : PBT substance

Additional ecological information : No data available

1,2,3,5-Tetrachlorobenzene:

Additional ecological information : No data available

1,2,4,5-Tetrachlorobenzene:

Additional ecological information : Biological effects:

Discharge into the environment must be avoided.

1,2,3,4-Tetrachlorbenzol:

Additional ecological information : No data available

Endocrine disrupting properties

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other

waste. Handle uncleaned containers like the product itself.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	: UN 1593
Proper shipping name	: Dichloromethane
Class	: 6.1
Packing group	: III
Labels	: Division 6.1 - Toxic substances
Packing instruction (cargo aircraft)	: 663
Packing instruction (passenger aircraft)	: 655

IMDG-Code

UN number	: UN 1593
Proper shipping name	: DICHLOROMETHANE
Class	: 6.1
Packing group	: III
Labels	: 6.1
EmS Code	: F-A, S-A
Marine pollutant	: no

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

National Regulations

49 CFR

UN/ID/NA number	: UN 1593
Proper shipping name	: Dichloromethane
Class	: 6.1
Packing group	: III
Labels	: Division 6.1 - Toxic substances
ERG Code	: 160
Marine pollutant	: no
Poison Inhalation Hazard	: 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.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Hexachlorobuta-1,3-diene	87-68-3	1	500
Hexachloroethane	67-72-1	100	100 (D034)
Hexachlorobenzene	118-74-1	10	10 (D032)
Hexachlorobuta-1,3-diene	87-68-3	1	1 (D033)
1,4-dichlorobenzene	106-46-7	100	100 (D027)

SARA 304 Extremely Hazardous Substances Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
1,2,3,4,5,5-Hexachlorocyclopentadiene	77-47-4	10	5000

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Acute Health Hazard
Chronic Health Hazard

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Dichloromethane	75-09-2	>= 90 - <= 100 %
Hexachloroethane	67-72-1	>= 0.1 - < 1 %
Hexachlorobenzene	118-74-1	>= 0.1 - < 1 %
Pentachlorobenzene	608-93-5	>= 0.1 - < 1 %

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B). The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 112 (40 CFR 61):

Dichloromethane	75-09-2	>= 90 - <= 100 %
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This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489):

Dichloromethane	75-09-2	>= 90 - <= 100 %
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Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

1,2,3,4,5,5-Hexachlorocyclopentadiene	77-47-4	$\geq 0.1 - < 1 \%$
1,4-dichlorobenzene	106-46-7	$\geq 0 - < 0.1 \%$

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

1,2,3,4,5,5-Hexachlorocyclopentadiene	77-47-4	$\geq 0.1 - < 1 \%$
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This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

Dichloromethane	75-09-2	$\geq 90 - \leq 100 \%$
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This product contains the following priority pollutants related to the U.S. Clean Water Act:

Dichloromethane	75-09-2	$\geq 90 - \leq 100 \%$
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US State Regulations

Massachusetts Right To Know

Dichloromethane	75-09-2
Hexachloroethane	67-72-1
Hexachlorobenzene	118-74-1
1,2,3,4,5,5-Hexachlorocyclopentadiene	77-47-4
Hexachlorobuta-1,3-diene	87-68-3
1,4-dichlorobenzene	106-46-7

Pennsylvania Right To Know

Dichloromethane	75-09-2
Hexachloroethane	67-72-1
Hexachlorobenzene	118-74-1
1,2,3,4,5,5-Hexachlorocyclopentadiene	77-47-4
Hexachlorobuta-1,3-diene	87-68-3
1,2,3-trichlorobenzene	87-61-6
1,2,3,5-Tetrachlorobenzene	634-90-2
Pentachlorobenzene	608-93-5
1,2,4,5-Tetrachlorobenzene	95-94-3
1,2,3,4-Tetrachlorbenzol	634-66-2

Maine Chemicals of High Concern

Hexachlorobenzene	118-74-1
Pentachlorobenzene	608-93-5

Vermont Chemicals of High Concern

Dichloromethane	75-09-2
Hexachlorobenzene	118-74-1
Hexachlorobuta-1,3-diene	87-68-3
Pentachlorobenzene	608-93-5

Washington Chemicals of High Concern

Dichloromethane	75-09-2
Hexachlorobenzene	118-74-1

California Prop. 65

WARNING: This product can expose you to chemicals including Dichloromethane, Hexachloroethane, Hexachlorobenzene, Hexachlorobuta-1,3-diene, 1,4-dichlorobenzene, which is/are known to the State of California to cause cancer, and Hexachlorobenzene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov. **International Regulations**

Rotterdam Convention (Prior Informed Consent) : Hexachlorobenzene

Stockholm Convention (Persistent Organic Pollutants) : Hexachlorobenzene
Hexachlorobuta-1,3-diene
Pentachlorobenzene

The components of this product are reported in the following inventories:

US TSCA : Product contains substance(s) not active on TSCA inventory.

TSCA list

The following substance(s) is/are subject to a Significant New Use Rule:

Pentachlorobenzene 608-93-5 See 40 CFR § 721.1430; Final Rule

1,2,4,5-Tetrachlorobenzene 95-94-3 See 40 CFR § 721.1435; Final Rule

After February 3, 2025, this chemical substance (as defined in TSCA section 3(2))/product cannot be distributed in commerce to retailers. After January 28, 2026, this chemical substance (as defined in TSCA section 3(2))/product is and can only be distributed in commerce or processed with a concentration of methylene chloride equal to or greater than 0.1% by weight for the following purposes: (1) Processing as a reactant; (2) Processing for incorporation into a formulation, mixture, or reaction product; (3) Processing for repackaging; (4) Processing for recycling; (5) Industrial or commercial use as a laboratory chemical; (6) Industrial or commercial use as a bonding agent for solvent welding; (7) Industrial and commercial use as a paint and coating remover from safety critical, corrosion-sensitive components of aircraft and spacecraft; (8) Industrial and commercial use as a processing aid; (9) Industrial and commercial use for plastic and rubber products manufacturing; (10) Industrial and commercial use as a solvent that becomes part of a formulation or mixture, where that formulation or mixture will be used inside a manufacturing process, and the solvent (methylene chloride) will be reclaimed; (11) Industrial and commercial use in the refinishing for wooden furniture, decorative pieces, and architectural fixtures of artistic, cultural or historic value until May 8, 2029; (12) Industrial and commercial use in adhesives and sealants in aircraft, space vehicle, and turbine applications for structural and safety critical non-structural applications until May 8, 2029; (13) Disposal; and (14) Export.

The following substance(s) is/are subject to TSCA 12(b) export notification requirements:
Dichloromethane 75-09-2

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH	: USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	: ACGIH - Biological Exposure Indices (BEI)
NIOSH REL	: USA. NIOSH Recommended Exposure Limits
OSHA CARC	: OSHA Specifically Regulated Chemicals/Carcinogens
OSHA Z-1	: USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
TSCA ECEL	: TSCA Existing Chemical Exposure Limit
ACGIH / TWA	: 8-hour, time-weighted average
NIOSH REL / TWA	: Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA CARC / PEL	: Permissible exposure limit (PEL)
OSHA CARC / STEL	: Excursion limit
OSHA Z-1 / TWA	: 8-hour time weighted average
TSCA ECEL / ECEL-TWA	: Existing Chemical Exposure List (TWA)
TSCA ECEL / EPA STEL	: EPA STEL

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; 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 Harmonised System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; 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 Organisation; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardisation; 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; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organisation 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; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and

Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; 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

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Revision Date : 07/14/2026

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