• SAFETY DATA SHEET

Version 9.2
Revision Date 12/29/2025
Print Date 12/30/2025

SECTION 1. IDENTIFICATION

1.1 Product identifiers

Product name : Residual Solvents Mixture - Class 1

Product Number : 1601102
Brand : US Pharmacopeia

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

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : After June 16, 2025, this chemical substance (as defined in TSCA section 3(2)) may not be distributed in commerce or processed in greater than trace quantities for the following purposes: Incorporation into formulation, mixture or reaction products in petrochemical-derived manufacturing except in the manufacture of vinyl chloride; Industrial and commercial use as an industrial processing aid in the manufacture of petrochemicals-derived products except in the manufacture of vinyl chloride; Industrial and commercial use in the manufacture of other basic chemicals (including manufacturing of chlorinated compounds used in solvents, adhesives, asphalt, and paints and coatings), except for use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda and the recovery of chlorine in tail gas from the production of chlorine; Industrial and commercial use in metal recovery; Industrial and commercial use as an additive; and beginning December 18, 2025, industrial and commercial specialty uses by the U.S. Department of Defense.
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.

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

Flammable liquids	:	Category 4
Skin sensitisation	:	Category 1
Germ cell mutagenicity	:	Category 1B
Carcinogenicity	:	Category 1A
Specific target organ toxicity - repeated exposure	:	Category 1 (Liver, Kidney, Blood)
Specific target organ toxicity - repeated exposure (Inhalation)	:	Category 1 (Nose, Liver, Kidney)
Specific target organ toxicity - repeated exposure (Oral)	:	Category 2 (Liver)
Short-term (acute) aquatic hazard	:	Category 3
Hazardous to the ozone layer	:	Category 1

Other hazards

None known.

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements	:	H227 Combustible liquid. H317 May cause an allergic skin reaction. H340 May cause genetic defects. H350 May cause cancer. H372 Causes damage to organs (Liver, Kidney, Blood) through prolonged or repeated exposure. H372 Causes damage to organs (Nose, Liver, Kidney) through prolonged or repeated exposure if inhaled. H373 May cause damage to organs (Liver) through prolonged or repeated exposure if swallowed. H402 Harmful to aquatic life. H420 Harms public health and the environment by destroying ozone in the upper atmosphere.
Precautionary statements	:	**Prevention:** P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P260 Do not breathe mist or vapours. P264 Wash skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P272 Contaminated work clothing must 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. P308 + P313 IF exposed or concerned: Get medical advice/ attention. P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention. P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish. **Storage:** P403 Store in a well-ventilated place. P405 Store locked up. **Disposal:** P501 Dispose of contents/ container to an approved waste disposal plant. P502 Refer to manufacturer or supplier for information on recovery or recycling.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

CAS-No. : Not Assigned

Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
dimethyl sulphoxide	67-68-5*	>= 80 - <= 100	TSC
1,1,1-Trichloroethane	71-55-6*	>= 3 - <= 7	TSC
1,1-Dichloroethene	75-35-4*	>= 1 - <= 5	TSC
1,2-Dichloroethane	107-06-2*	>= 1 - <= 5	TSC
Carbon tetrachloride	56-23-5*	>= 1 - <= 5	TSC
benzene	71-43-2*	>= 0.5 - <= 1.5	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 : Show this safety data sheet to the doctor in attendance.

If inhaled : After inhalation: fresh air. Call in physician.

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 2.2) 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	:	Foam Carbon dioxide (CO2) Dry powder
Unsuitable extinguishing media	:	For this substance/mixture no limitations of extinguishing agents are given.
Specific hazards during fire fighting	:	Combustible. Vapours are heavier than air and may spread along floors. Forms explosive mixtures with air on intense heating. Development of hazardous combustion gases or vapours possible in the event of fire.
Hazardous combustion products	:	Carbon oxides Sulphur oxides Hydrogen chloride gas
Specific extinguishing methods	:	No data available
Further information	:	Remove container from danger zone and cool with water. 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

Personal precautions, protective equipment and emergency procedures	:	Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert. Advice for emergency responders: For personal protection see 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 2.2.

Advice on protection against fire and explosion	:	Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.
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	:	6.1C, Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects
Recommended storage	:	36 - 86 °F / 2 - 30 °C

temperature

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
dimethyl sulphoxide	67-68-5	TWA	250 ppm	US WEEL
1,1,1-Trichloroethane	71-55-6	TWA	350 ppm	ACGIH
		STEL	450 ppm	ACGIH
		C	350 ppm 1,900 mg/m3	NIOSH REL
		TWA	350 ppm 1,900 mg/m3	OSHA Z-1
1,1-Dichloroethene	75-35-4	TWA	5 ppm	ACGIH
1,2-Dichloroethane	107-06-2	TWA	10 ppm	ACGIH
		ST	2 ppm 8 mg/m3	NIOSH REL
		TWA	1 ppm 4 mg/m3	NIOSH REL
		TWA	50 ppm	OSHA Z-2
		CEIL	100 ppm	OSHA Z-2
		Peak	200 ppm (5 mins. in any 3 hrs.)	OSHA Z-2
Carbon tetrachloride	56-23-5	TWA	5 ppm	ACGIH
		STEL	10 ppm	ACGIH
		ST	2 ppm 12.6 mg/m3	NIOSH REL
		TWA	10 ppm	OSHA Z-2
		CEIL	25 ppm	OSHA Z-2
		Peak	200 ppm (5 mins. in any 4 hrs.)	OSHA Z-2
		ECEL-TWA (Inhalation exposure)	0.03 ppm 0.2 mg/m3	TSCA ECEL
benzene	71-43-2	TWA	0.5 ppm	ACGIH
		STEL	2.5 ppm	ACGIH
		TWA	10 ppm	OSHA Z-2
		CEIL	25 ppm	OSHA Z-2
		Peak	50 ppm	OSHA Z-2
		TWA	0.1 ppm	NIOSH REL
		ST	1 ppm	NIOSH REL

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
1,1,1-Trichloroethane	71-55-6	Methyl chloroform	In end-exhaled air	Prior to last shift of workweek	20 parts per million	ACGIH BEI
		Methyl chloroform	Urine	End of shift	700 µg/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 entrepeneur 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
Color	:	No data available
Odor	:	No data available
Odor 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)	:	No data available
Burning rate	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor 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	:	No data available
Decomposition temperature	:	No data available

Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Flow time	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available
Particle characteristics Particle size	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Forms explosive mixtures with air on intense heating. A range from approx. 15 Kelvin below the flash point is to be rated as critical.
Chemical stability	:	The product is chemically stable under standard ambient conditions (room temperature) .
Possibility of hazardous reactions	:	Violent reactions possible with:
Conditions to avoid	:	Strong heating.
Incompatible materials	:	Strong bases Oxidizing agents Strong oxidizing agents Strong acids Acid chlorides Oxygen Peroxides Copper Aluminum Strong reducing agents
Hazardous decomposition products	:	In the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Mixture

Acute toxicity
Acute toxicity estimate Oral - 4,174 mg/kg
(Calculation method)
Acute toxicity estimate Inhalation - 4 h - 67.25 mg/l - vapour(Calculation method)

Acute toxicity estimate Dermal - > 5,000 mg/kg
(Calculation method)

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
Mixture may cause an allergic skin reaction.

Germ cell mutagenicity
Possible mutagen

Carcinogenicity
Possible human carcinogen

IARC:	1 - Group 1: Carcinogenic to humans (benzene)
IARC:	2A - Group 2A: Probably carcinogenic to humans (1,1,1-Trichloroethane)
IARC:	2B - Group 2B: Possibly carcinogenic to humans (1,1-Dichloroethene)
IARC:	2B - Group 2B: Possibly carcinogenic to humans (1,2-Dichloroethane)
IARC:	2B - Group 2B: Possibly carcinogenic to humans (Carbon tetrachloride)
NTP:	Known - Known to be human carcinogen (benzene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,2-Dichloroethane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Carbon tetrachloride)
OSHA:	OSHA specifically regulated carcinogen (benzene)

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Mixture causes damage to organs through prolonged or repeated exposure.
- Liver, Kidney, Blood
Mixture causes damage to organs through prolonged or repeated exposure.
- Nose, Liver, Kidney
Mixture may cause damage to organs through prolonged or repeated exposure.

- Liver

Aspiration hazard
No data available

11.2 Additional Information

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
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.

Eyes - Eye disease - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

Components

dimethyl sulphoxide

Acute toxicity
LD50 Oral - Rat - male and female - 28,300 mg/kg
(OECD Test Guideline 401)
LC0 Inhalation - Rat - male and female - 4 h - > 5.33 mg/l - dust/mist
(OECD Test Guideline 403)
LD50 Dermal - Rat - male and female - 40,000 mg/kg
Remarks: (ECHA)

Skin corrosion/irritation
Skin - Rabbit
Result: slight irritation - 4 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: slight irritation - 24 h
(OECD Test Guideline 405)

Respiratory or skin sensitization
Maximisation Test - Guinea pig
Result: negative
(OECD Test Guideline 406)
Local lymph node assay (LLNA) - Mouse

Result: negative
(OECD Test Guideline 429)

Germ cell mutagenicity
Test Type: Ames test
Test system: Salmonella typhimurium
Result: negative
Test Type: sister chromatid exchange assay
Test system: Chinese hamster ovary cells
Result: negative
Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Test system: Chinese hamster ovary cells
Result: negative
Method: OECD Test Guideline 474
Species: Rat - 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

1,1,1-Trichloroethane

Acute toxicity
LD50 Oral - Rat - 9,600 mg/kg
Symptoms: Nausea, Vomiting, Risk of aspiration upon vomiting., Aspiration may cause pulmonary oedema and pneumonitis.
Remarks: (RTECS)
Acute toxicity estimate Inhalation - 4 h - 19 mg/l - vapour
(Expert judgement)
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)
Dermal: No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Skin irritation - 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: slight irritation

Remarks: (ECHA)

Respiratory or skin sensitization
Maximisation Test - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity
Test Type: Ames test
Test system: Salmonella typhimurium
Result: negative
Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Result: Positive results were obtained in some in vitro tests.

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available
Acute oral toxicity - Nausea, Vomiting, Risk of aspiration upon vomiting., Aspiration may cause pulmonary oedema and pneumonitis.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

1,1-Dichloroethene

Acute toxicity
LD50 Oral - Rat - female - 1,500 mg/kg
Remarks: (ECHA)
Acute toxicity estimate Inhalation - 4 h - 11.1 mg/l - vapour
(Expert judgement)
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)
Dermal: No data available

Skin corrosion/irritation
Skin - reconstructed human epidermis (RhE)
Result: No skin irritation - 3 - 60 min
(Regulation (EC) No. 440/2008, Annex, B.40)

Serious eye damage/eye irritation
Eyes - Bovine cornea
Result: Causes serious eye irritation. - 10 min
(OECD Test Guideline 437)

Respiratory or skin sensitization
Local lymph node assay (LLNA) - Mouse

Result: negative
(OECD Test Guideline 429)

Germ cell mutagenicity
Based on available data the classification criteria are not met.
Method: OECD Test Guideline 489
Species: Rat - male - Bone marrow
Result: positive
Method: OECD Test Guideline 474
Species: Mouse - Bone marrow
Result: negative
Method: OECD Test Guideline 474
Species: Mouse - Bone marrow
Result: negative
Method: OECD Test Guideline 478
Species: Rat - Implant
Result: negative

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
Inhalation - Causes damage to organs through prolonged or repeated exposure.
- Nose
Oral - May cause damage to organs through prolonged or repeated exposure.
- Liver

Aspiration hazard
No data available

1,2-Dichloroethane

Acute toxicity
LD50 Oral - Rat - male - 770 mg/kg
(OECD Test Guideline 401)
LC50 Inhalation - Rat - male and female - 4 h - 7.8 mg/l - vapour
(OECD Test Guideline 403)
LD50 Dermal - Rabbit - male - 4,890 mg/kg
(OECD Test Guideline 402)

Skin corrosion/irritation
Skin - Rabbit
Result: irritating
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Eye irritation

(OECD Test Guideline 405)

Respiratory or skin sensitization
Local lymph node assay (LLNA) - Mouse
Result: negative
(OECD Test Guideline 429)

Germ cell mutagenicity
Test Type: Ames test
Test system: S. typhimurium
Result: positive
Remarks: (ECHA)
Test Type: Ames test
Test system: Escherichia coli
Result: positive
Test Type: In vitro mammalian cell gene mutation test
Test system: human lymphoblastoid cells
Result: positive
Test Type: In vitro mammalian cell gene mutation test
Test system: human lymphoblastoid cells
Result: positive
Remarks: (ECHA)
Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Test system: Chinese hamster lung cells
Result: positive
Remarks: (ECHA)
Test Type: unscheduled DNA synthesis assay
Test system: rat hepatocytes
Result: positive
Method: OECD Test Guideline 474
Species: Mouse - male and female
Result: negative
Method: OECD Test Guideline 474
Species: Mouse - male and female - Red blood cells (erythrocytes)
Result: negative
Species: Rat - female - mammary gland
Result: negative
Remarks: (ECHA)
Method: OECD Test Guideline 477
Species: Drosophila melanogaster - male - sperm
Result: positive
Species: Mouse - male
Result: negative
Remarks: (ECHA)

Carcinogenicity
Presumed to have carcinogenic potential for humans

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

Aspiration hazard
Aspiration may cause pulmonary oedema and pneumonitis.

Carbon tetrachloride

Acute toxicity
LD50 Oral - Rat - 2,350 mg/kg
Remarks: (RTECS)
LC50 Inhalation - Rat - 4 h - 8000 ppm - vapour
LD50 Dermal - Rabbit - > 20,000 mg/kg
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Mild skin irritation - 24 h
(Draize Test)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Mild eye irritation - 24 h
(Draize Test)

Respiratory or skin sensitization
- Mouse
Result: The product is a skin sensitiser, sub-category 1B.
(OECD Test Guideline 429)

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
Inhalation - Causes damage to organs through prolonged or repeated exposure.
- Liver, Kidney

Aspiration hazard
No data available

benzene

Acute toxicity
LD50 Oral - Rat - male - > 2,000 mg/kg
(OECD Test Guideline 401)
Symptoms: Nausea

LD50 Oral - Rat - male and female - 3,002 mg/kg
(OECD Test Guideline 401)
Symptoms: Risk of aspiration upon vomiting., Aspiration may cause pulmonary oedema and pneumonitis.
Inhalation: No data available
Symptoms: mucosal irritations
LD50 Dermal - Rabbit - 13,630 mg/kg
Remarks: (IUCLID)
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: irritating
(OECD Test Guideline 404)
Remarks: (ECHA)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Irritating to eyes.
(OECD Test Guideline 405)
Remarks: (IUCLID)
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Respiratory or skin sensitization
Maximisation Test - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity
May cause genetic defects.
Test Type: Ames test
Test system: Escherichia coli/Salmonella typhimurium
Result: negative
Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Result: negative
Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster lung cells
Result: negative
Method: OECD Test Guideline 474
Species: Mouse - male - Bone marrow
Result: positive

Carcinogenicity
May cause cancer. Positive evidence from human epidemiological studies.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available
Acute oral toxicity - Nausea

Acute oral toxicity - Risk of aspiration upon vomiting., Aspiration may cause pulmonary oedema and pneumonitis.
Acute inhalation toxicity - mucosal irritations

Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure.
- Blood
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Aspiration hazard
Aspiration may cause pulmonary oedema and pneumonitis.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

dimethyl sulphoxide:

Toxicity to fish	:	LC50 (Danio rerio (zebra fish)): > 25,000 mg/l End point: mortality Exposure time: 96 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 203 GLP: yes
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 24,600 mg/l Exposure time: 48 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): 17,000 mg/l Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 201 GLP: yes
Toxicity to microorganisms	:	EC50 (activated sludge): 10 - 100 mg/l Exposure time: 30 min Method: ISO 8192

1,1,1-Trichloroethane:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 52.8 mg/l End point: mortality

Exposure time: 96 h
Test Type: static test
Analytical monitoring: yes
Method: US-EPA

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 530 mg/l Exposure time: 48 h Test Type: static test Method: US-EPA
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (algae)): 41 mg/l Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 201 GLP: yes NOEC (Pseudokirchneriella subcapitata (green algae)): 7.8 mg/l End point: Growth inhibition Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 201 GLP: yes
Toxicity to fish (Chronic toxicity)	:	NOEC (Cyprinus carpio (Carp)): 7.7 mg/l End point: mortality Exposure time: 14 d Test Type: flow-through test Analytical monitoring: yes Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 1.3 mg/l End point: reproduction rate Exposure time: 17 d Test Type: semi-static test Analytical monitoring: yes Remarks: (ECHA)
Toxicity to microorganisms	:	EC50 (activated sludge): 360 mg/l Exposure time: 30 min Analytical monitoring: yes Method: OECD Test Guideline 209

Ecotoxicology Assessment

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

1,1-Dichloroethene:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 108 mg/l Exposure time: 96 h Test Type: flow-through test Analytical monitoring: yes Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 37 mg/l End point: Immobilization Exposure time: 48 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 202 GLP: yes Remarks: (ECHA)
Toxicity to algae/aquatic plants	:	EC50 (Chlamydomonas reinhardtii (green algae)): 9.12 mg/l Exposure time: 72 h Test Type: static test Analytical monitoring: yes Remarks: (ECHA) EC10: 3.94 mg/l Exposure time: 72 h Remarks: (ECHA)
Toxicity to microorganisms	:	EC50 (Pseudomonas putida): > 2,000 mg/l Exposure time: 17 h Remarks: (IUCLID)

Ecotoxicology Assessment

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

1,2-Dichloroethane:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 136 mg/l End point: mortality Exposure time: 96 h Test Type: flow-through test Analytical monitoring: yes Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 160 mg/l End point: Immobilization Exposure time: 48 h

Test Type: static test
Analytical monitoring: yes
Remarks: (in soft water)
(IUCLID)

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 166 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 11 mg/l
End point: reproduction rate
Exposure time: 28 d
Test Type: static test
Analytical monitoring: yes
Remarks: (ECHA)

Toxicity to microorganisms : EC50 (activated sludge): 35,500 mg/l
Exposure time: 3 h
Test Type: static test
Method: OECD Test Guideline 209

Carbon tetrachloride:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 24.3 mg/l
Exposure time: 96 h
Test Type: mortality

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 35 mg/l
Exposure time: 48 h
Test Type: Immobilization
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Algae): 20 mg/l
Exposure time: 72 h
Test Type: Growth inhibition
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity) : NOEC (Danio rerio (zebra fish)): 2.5 mg/l
Exposure time: 14 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 3.1 mg/l
Exposure time: 21 d

benzene:

Toxicity to fish : LC50 (Oryzias latipes (Orange-red killifish)): > 100

mg/l
End point: mortality
Exposure time: 96 h
Test Type: semi-static test
Analytical monitoring: yes
Method: OECD Test Guideline 203
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1,000 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: semi-static test
Analytical monitoring: yes
Method: OECD Test Guideline 202
GLP: yes

NOEC (Daphnia magna (Water flea)): > 1,000 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: semi-static test
Analytical monitoring: yes
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
GLP: yes

NOEC (Pseudokirchneriella subcapitata (green algae)): >= 1,000 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
GLP: yes

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)): 0.8 mg/l
Exposure time: 32 d
Test Type: flow-through test
Analytical monitoring: yes
Remarks: (ECHA)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : LC50 (Daphnia magna (Water flea)): > 100 mg/l
End point: mortality
Exposure time: 21 d
Test Type: semi-static test

Analytical monitoring: yes
Method: OECD Test Guideline 211
GLP: yes

Toxicity to microorganisms : EC50 (activated sludge): > 1,000 mg/l
Exposure time: 3 h
Test Type: static test
Method: OECD Test Guideline 209
GLP: yes

Ecotoxicology Assessment

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

Persistence and degradability

Components:

dimethyl sulphoxide:

Biodegradability : aerobic
Concentration: 2 mg/l
Result: Not readily biodegradable.
Biodegradation: 31 %
Exposure time: 28 d
Method: OECD Test Guideline 301D
GLP: yes

Stability in water : Degradation half life: 0.12 - 1.2 h (30 °C) pH: 7
Remarks: Hydrolyses readily.

1,1,1-Trichloroethane:

Biodegradability : anaerobic
Result: Inherently biodegradable.
Biodegradation: 64 %
Exposure time: 14 d
Remarks: (ECHA)

1,1-Dichloroethene:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

1,2-Dichloroethane:

Biodegradability : aerobic
Concentration: 0.25 mg/l
Result: Inherently biodegradable.
Biodegradation: > 90 %
Exposure time: 20 d

Remarks: (ECHA)

Carbon tetrachloride:

Biodegradability : Remarks: No data available

benzene:

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Concentration: 17 mg/l
Result: Readily biodegradable.
Biodegradation: 96 %
Exposure time: 28 d
Method: OECD Test Guideline 301F
GLP: yes

Bioaccumulative potential

Components:

dimethyl sulphoxide:

Partition coefficient: n-octanol/water : log Pow: -1.35 (68 °F / 20 °C)
Remarks: Bioaccumulation is not expected.

1,1,1-Trichloroethane:

Bioaccumulation : Species: Lepomis macrochirus (Bluegill)
Bioconcentration factor (BCF): 9
Exposure time: 28 d
Temperature: 61 °F / 16 °C
Concentration: 0.0734 mg/l

Partition coefficient: n-octanol/water : log Pow: 2.49 (68 °F / 20 °C)
Remarks: Bioaccumulation is not expected.
(ECHA)

1,1-Dichloroethene:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 2.5 - 6.4
Exposure time: 6 Weeks
Temperature: 77 °F / 25 °C
Concentration: 0.5 mg/l
Method: OECD Test Guideline 305C
GLP: yes

1,2-Dichloroethane:

Bioaccumulation : Species: Lepomis macrochirus
Bioconcentration factor (BCF): 2
Exposure time: 14 d

Temperature: 61 °F / 16 °C
Concentration: 0.957 mg/l

Partition coefficient: n-octanol/water : log Pow: 1.45 (68 °F / 20 °C)
pH: 7.4
Method: OECD Test Guideline 107
Remarks: Bioaccumulation is not expected.

Carbon tetrachloride:

Bioaccumulation : Species: Lepomis macrochirus (Bluegill)
Bioconcentration factor (BCF): 30
Exposure time: 21 d
Concentration: 52.3 µg/l

Partition coefficient: n-octanol/water : log Pow: 2.83 (77 °F / 25 °C)
pH: 7
Method: OECD Test Guideline 107

benzene:

Bioaccumulation : Species: Leuciscus idus (Golden orfe)
Bioconcentration factor (BCF): 10
Exposure time: 3 d
Concentration: 0.05 mg/l

Partition coefficient: n-octanol/water : log Pow: 2.13 (77 °F / 25 °C)
pH: 7
Remarks: Bioaccumulation is not expected.
(ECHA)

Mobility in soil

Components:

1,1,1-Trichloroethane:

Stability in soil : Remarks: No data available

1,1-Dichloroethene:

Distribution among environmental compartments : Koc: 65, log Koc: 1.81
Method: (experimental)
Remarks: Mobile in soils

1,2-Dichloroethane:

Distribution among environmental compartments : Adsorption/Soil
Koc: 38, log Koc: 1.58
Method: (experimental)
Remarks: Mobile in soils

Remarks: (Lit.)

Carbon tetrachloride:

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
Warning: Manufactured with 1,1,1-Trichloroethane, Carbon tetrachloride, a substance which harms public health and environment by destroying ozone in the upper atmosphere.

Components:

1,1,1-Trichloroethane:

Ozone-Depletion Potential : 0.1
Regulation: UNEP - Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer (Update: 2020-01-01)
Group: Annex B - Group III: 1,1,1-trichloroethane (methyl chloroform)

0.1
Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances (Update: 2007-07-01)
Group: Group V

Additional ecological information : Biological effects:

Hazard for drinking water supplies.

Further information on ecology

Substance which may present a danger to the structure and/or the functioning of the stratospheric ozone layer according to EC Regulation No 2037/2000
(listed in Annex I, Group V).

Discharge into the environment must be avoided.

1,1-Dichloroethene:

Additional ecological information : Discharge into the environment must be avoided.

Carbon tetrachloride:

Ozone-Depletion Potential	:	1.1 Regulation: UNEP - Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer (Update: 2020-01-01) Group: Annex B - Group II: Carbon tetrachloride 1.1 Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances (Update: 2007-07-01) Group: Group IV
Additional ecological information	:	No data available

benzene:

Additional ecological information	:	Endangers drinking-water supplies if allowed to enter soil or water. Discharge into the environment must be avoided.

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
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to IMO instruments
Not applicable for product as supplied.

National Regulations

49 CFR Road

UN/ID/NA number	:	NA 1993

Proper shipping name	:	Combustible liquid, n.o.s. (dimethyl sulphoxide)
Class	:	CBL
Packing group	:	III
Labels	:	None
ERG Code	:	128
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)
Carbon tetrachloride	56-23-5	10	555
1,1,1-Trichloroethane	71-55-6	10	10 (F001)
Carbon tetrachloride	56-23-5	10	10 (F001)
1,1,1-Trichloroethane	71-55-6	10	10 (F002)
1,1-Dichloroethene	75-35-4	100	100 (D029)
1,2-Dichloroethane	107-06-2	100	100 (D028)
Carbon tetrachloride	56-23-5	10	10 (D019)
benzene	71-43-2	10	10 (D018)

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

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 : Fire Hazard
Acute Health Hazard
Chronic Health Hazard

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

1,1,1-Trichloroethane	71-55-6	>= 1 - < 5 %
1,1-Dichloroethene	75-35-4	>= 1 - < 5 %

1,2-Dichloroethane	107-06-2	>= 1 - < 5 %
Carbon tetrachloride	56-23-5	>= 1 - < 5 %
benzene	71-43-2	>= 1 - < 5 %

Clean Air Act

Warning: Manufactured with 1,1,1-Trichloroethane, Carbon tetrachloride, a substance which harms public health and environment by destroying ozone in the upper atmosphere.

UNEP - Handbook for the Montreal Protocol on Substances that Deplete the Ozone LayerOzone-Depletion Potential	:	1,1,1-trichloroethane	71-55-6
40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I SubstancesOzone-Depletion Potential	:	Trichloroethane	71-55-6
UNEP - Handbook for the Montreal Protocol on Substances that Deplete the Ozone LayerOzone-Depletion Potential	:	carbon tetrachloride	56-23-5
40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I SubstancesOzone-Depletion Potential	:	Carbon Tetrachloride	56-23-5

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 112 (40 CFR 61):

1,1,1-Trichloroethane	71-55-6	>= 1 - < 5 %
1,1-Dichloroethene	75-35-4	>= 1 - < 5 %
1,2-Dichloroethane	107-06-2	>= 1 - < 5 %
Carbon tetrachloride	56-23-5	>= 1 - < 5 %
benzene	71-43-2	>= 1 - < 5 %

The following chemical(s) are listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F):

1,1-Dichloroethene	75-35-4	>= 1 - < 5 %

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

dimethyl sulphoxide	67-68-5	>= 70 - < 90 %
1,1,1-Trichloroethane	71-55-6	>= 1 - < 5 %
1,1-Dichloroethene	75-35-4	>= 1 - < 5 %
1,2-Dichloroethane	107-06-2	>= 1 - < 5 %
Carbon tetrachloride	56-23-5	>= 1 - < 5 %
benzene	71-43-2	>= 1 - < 5 %

Clean Water Act

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

1,1-Dichloroethene	75-35-4	>= 1 - < 5 %
1,2-Dichloroethane	107-06-2	>= 1 - < 5 %
Carbon tetrachloride	56-23-5	>= 1 - < 5 %
benzene	71-43-2	>= 1 - < 5 %

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

1,1-Dichloroethene	75-35-4	>= 1 - < 5 %
1,2-Dichloroethane	107-06-2	>= 1 - < 5 %
Carbon tetrachloride	56-23-5	>= 1 - < 5 %
benzene	71-43-2	>= 1 - < 5 %

This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

1,1,1-Trichloroethane	71-55-6	>= 1 - < 5 %
1,1-Dichloroethene	75-35-4	>= 1 - < 5 %
1,2-Dichloroethane	107-06-2	>= 1 - < 5 %
Carbon tetrachloride	56-23-5	>= 1 - < 5 %
benzene	71-43-2	>= 1 - < 5 %

This product contains the following priority pollutants related to the U.S. Clean Water Act:

1,1,1-Trichloroethane	71-55-6	>= 1 - < 5 %
1,1-Dichloroethene	75-35-4	>= 1 - < 5 %
1,2-Dichloroethane	107-06-2	>= 1 - < 5 %
Carbon tetrachloride	56-23-5	>= 1 - < 5 %
benzene	71-43-2	>= 1 - < 5 %

US State Regulations

Massachusetts Right To Know

1,1,1-Trichloroethane	71-55-6
1,1-Dichloroethene	75-35-4
1,2-Dichloroethane	107-06-2
Carbon tetrachloride	56-23-5
benzene	71-43-2

Pennsylvania Right To Know

1,1,1-Trichloroethane	71-55-6
1,1-Dichloroethene	75-35-4
1,2-Dichloroethane	107-06-2
Carbon tetrachloride	56-23-5
benzene	71-43-2

Maine Chemicals of High Concern

benzene 71-43-2

Vermont Chemicals of High Concern

benzene 71-43-2

Washington Chemicals of High Concern

benzene 71-43-2

California Prop. 65

WARNING: This product can expose you to chemicals including 1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2-Dichloroethane, Carbon tetrachloride, benzene, which is/are known to the State of California to cause cancer, and
benzene, 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

Montreal Protocol : 1,1,1-Trichloroethane
Carbon tetrachloride

Rotterdam Convention (Prior Informed Consent) : 1,2-Dichloroethane

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

TSCA : All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

After June 16, 2025, this chemical substance (as defined in TSCA section 3(2)) may not be distributed in commerce or processed in greater than trace quantities for the following purposes: Incorporation into formulation, mixture or reaction products in petrochemical-derived manufacturing except in the manufacture of vinyl chloride; Industrial and commercial use as an industrial processing aid in the manufacture of petrochemicals-derived products except in the manufacture of vinyl chloride; Industrial and commercial use in the manufacture of other basic chemicals (including manufacturing of chlorinated compounds used in solvents, adhesives, asphalt, and paints and coatings), except for use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda and the recovery of chlorine in tail gas from the production of chlorine; Industrial and commercial use in metal recovery; Industrial and commercial use as an additive; and beginning December 18, 2025, industrial and commercial specialty uses by the U.S. Department of Defense.

The following substance(s) is/are subject to TSCA 12(b) export notification requirements:
1,2-Dichloroethane 107-06-2
Carbon tetrachloride 56-23-5

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 Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-2	:	USA. Occupational Exposure Limits (OSHA) - Table Z-2
TSCA ECEL	:	TSCA Existing Chemical Exposure Limit
US WEEL	:	USA. Workplace Environmental Exposure Levels (WEEL)
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
NIOSH REL / C	:	Ceiling value not be exceeded at any time.
OSHA Z-1 / TWA	:	8-hour time weighted average
OSHA Z-2 / TWA	:	8-hour time weighted average
OSHA Z-2 / CEIL	:	Acceptable ceiling concentration
OSHA Z-2 / Peak	:	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift
TSCA ECEL / ECEL-TWA	:	Existing Chemical Exposure List (TWA)
US WEEL / TWA	:	8-hr TWA

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.

Revision Date : 12/29/2025

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

US / EN