JM IV HFO Closed Cell SPF

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SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Trade name : JM IV HFO Closed Cell SPF

Manufacturer or supplier's details

Company : Johns Manville
Address : P.O. Box 5108
Denver, CO USA 80217-5108
Telephone : +1-303-978-2000
Emergency telephone number : 24-Hour Number: +1-800-424-9300 (CHEMTREC)

Recommended use of the chemical and restrictions on use

Restrictions on use : For professional users only.
Prepared by : productsafety@jm.com

SECTION 2. HAZARDS IDENTIFICATION

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

Skin irritation : Category 2

Serious eye damage : Category 1

Skin sensitisation : Category 1

Germ cell mutagenicity : Category 1B

Carcinogenicity : Category 1B

Reproductive toxicity : Category 1B

Specific target organ toxicity - repeated exposure (Oral) : Category 2 (Kidney)

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H340 May cause genetic defects.
H350 May cause cancer.
H360 May damage fertility or the unborn child.
H373 May cause damage to organs (Kidney) through prolonged or repeated exposure if swallowed.

Precautionary statements :

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe mist or vapours.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature
Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
1-Propene, 1-chloro-3,3,3-trifluoro-, (1E)-	102687-65-0	>= 7 - < 13
2-Propanol, 1-chloro-, 2,2',2''-phosphate; 2-Propanol, 1-chloro-, phosphate (3:1)	13674-84-5	>= 5 - < 10
Ethanol, 2,2'-oxybis-; Diethylene glycol	111-46-6	>= 1 - < 5
Ethylene glycol; 1,2-Ethanediol	107-21-1	>= 1 - < 5
1,1,3,3-Tetramethylguanidine	80-70-6	>= 1 - < 5
1-Propanol, 2,2-dimethyl-, tribromo deriv.	36483-57-5	>= 1 - < 5
1,4-Dioxane	123-91-1	>= 0.1 - < 1
Stannane, dibutylbis(dodecylthio)-; Dibutylbis(dodecylthio)stannane	1185-81-5	>= 0.1 - < 1

Actual concentration or concentration range is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice	:	Move out of dangerous area. Show this safety data sheet to the doctor in attendance. Do not leave the victim unattended.
If inhaled	:	Remove to fresh air immediately. Get medical attention immediately. If breathing is irregular or stopped, administer artificial respiration.
In case of skin contact	:	In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Take off all contaminated clothing immediately. Wash contaminated clothing before re-use. Call a physician if irritation develops or persists.
In case of eye contact	:	In case of contact, immediately flush eyes with plenty of water for at least 30 minutes. If easy to do, remove contact lens, if worn. Protect unharmed eye. Continue rinsing eyes during transport to hospital.
If swallowed	:	DO NOT induce vomiting unless directed to do so by a physician or poison control center. Gently wipe or rinse the inside of the mouth with water. Never give anything by mouth to an unconscious person. Get medical attention immediately. If breathing is irregular or stopped, administer artificial respiration.
Most important symptoms and effects, both acute and delayed	:	Causes skin irritation. May cause an allergic skin reaction. Causes serious eye damage. May cause genetic defects. May cause cancer if swallowed. May cause cancer by inhalation. May damage fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure if swallowed.
Protection of first-aiders	:	If potential for exposure exists refer to Section 8 for specific personal protective equipment.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water spray Dry chemical Carbon dioxide (CO2) Foam
Unsuitable extinguishing media	:	High volume water jet
Specific hazards during firefighting	:	Cool closed containers exposed to fire with water spray.
Hazardous combustion products	:	carbon oxides fluorine compounds olefins Hydrogen fluoride chlorine compounds phosphorus oxides Hydrogen chloride gas nitrogen oxides hydrogen bromide

Specific extinguishing methods	:	Standard procedure for chemical fires.
Further information	:	Use a water spray to cool fully closed containers.
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Immediately evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Use personal protective equipment.
Environmental precautions	:	Prevent further leakage or spillage if safe to do so. The product should not be allowed to enter drains, water courses or the soil.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Fire or intense heat may cause violent rupture of packages.
Advice on safe handling	:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe mist or vapours. Avoid contact with skin and eyes. Wash skin thoroughly after handling. Smoking, eating and drinking should be prohibited in the application area. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves, protective clothing, eye protection and face protection. For personal protection see section 8.
Conditions for safe storage	:	Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected.
Materials to avoid	:	polymerisation initiators
Recommended storage temperature	:	50 - 75 °F / 10 - 24 °C
Storage period	:	6 Months
Further information on storage stability	:	Keep containers tightly closed in a dry, cool place.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type	Control	Basis

		(Form of exposure)	parameters / Permissible concentration	
1-Propene, 1-chloro-3,3,3-trifluoro-, (1E)-	102687-65-0	TWA	800 ppm	US WEEL
Ethanol, 2,2'-oxybis-; Diethylene glycol	111-46-6	TWA	10 mg/m3	US WEEL
Ethylene glycol; 1,2-Ethanediol	107-21-1	C (Aerosol only)	100 mg/m3	ACGIH
		TWA (Vapour)	25 ppm	ACGIH
		STEL (Vapour)	50 ppm	ACGIH
		STEL (Inhalable fraction, Aerosol only)	10 mg/m3	ACGIH
1,4-Dioxane	123-91-1	TWA	20 ppm	ACGIH
		C	1 ppm 3.6 mg/m3	NIOSH REL
		TWA	100 ppm 360 mg/m3	OSHA
Stannane, dibutylbis(dodecylthio)-; Dibutylbis(dodecylthio)stannane	1185-81-5	TWA	0.1 mg/m3 (Tin)	OSHA
		TWA	0.1 mg/m3 (Tin)	ACGIH
		STEL	0.2 mg/m3 (Tin)	ACGIH
		TWA	0.1 mg/m3 (Tin)	NIOSH REL

Personal protective equipment

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection

Material : Protective gloves

Remarks : Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Eye protection : Wear safety glasses with side shields or goggles.
Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or

		aerosols. Remove respiratory and skin/eye protection only after vapours have been cleared from the area.
Skin and body protection	:	Wear protective clothing, such as long-sleeved shirts and pants. Full protective suit Choose body protection according to the amount and concentration of the dangerous substance at the work place. Remove and wash contaminated clothing before re-use.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday. Written instructions for handling must be available at the work place.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	lavender
Odour	:	No data available
Odour Threshold	:	No data available
pH	:	6 - 8
Melting point/freezing point	:	Not applicable
Initial boiling point and boiling range	:	37.8 °C
Flash point	:	> 93.3 °C
Evaporation rate	:	No data available
Flammability (solid, gas)	:	Not applicable
Upper explosion limit	:	No data available
Lower explosion limit	:	No data available
Vapour pressure	:	No data available
Relative vapour density	:	No data available
Relative density	:	1.19 - 1.21
Density	:	1.2 g/cm³
Solubility(ies)		
Water solubility	:	slightly soluble
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Auto-ignition temperature	:	No data available
Thermal decomposition	:	No data available
Viscosity		
Viscosity, dynamic	:	400 - 600 mPa.s (25 °C)
Viscosity, kinematic	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Contact with isocyanates will cause polymerization. Stable under recommended storage conditions.
Conditions to avoid	:	Protect from frost, heat and sunlight. Exposure to moisture
Incompatible materials	:	Strong oxidizing agents isocyanates
Hazardous decomposition products	:	Hazardous decomposition products formed under fire conditions.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	:	Acute toxicity estimate : > 2,000 mg/kg Method: Calculation method
Acute dermal toxicity	:	Acute toxicity estimate : > 5,000 mg/kg Method: Calculation method

Components:

1-Propene, 1-chloro-3,3,3-trifluoro-, (1E)-:

Acute inhalation toxicity	:	LC50 (Rat, male and female): 120000 ppm Exposure time: 4 h Test atmosphere: gas Method: OECD Test Guideline 403

2-Propanol, 1-chloro-, 2,2',2''-phosphate; 2-Propanol, 1-chloro-, phosphate (3:1):

Acute oral toxicity	:	LD50 (Rat, female): 632 mg/kg Method: EC Directive 92/69/EEC B.1 Acute Toxicity (Oral)
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 7 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity Remarks: No mortality was observed.
Acute dermal toxicity	:	LD50 (Rabbit, male and female): > 2,000 mg/kg Method: OECD Test Guideline 402 Remarks: No mortality was observed.

Ethanol, 2,2'-oxybis-; Diethylene glycol:

Acute oral toxicity	:	LD50 (Humans): > 300 - 2,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 4.6 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity

Remarks: No mortality was observed.

Acute dermal toxicity : LD50 (Rabbit): 13,300 mg/kg

Ethylene glycol; 1,2-Ethanediol:

Acute oral toxicity : LD50 (Rat): 7,712 mg/kg
Method: Expert judgement
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : LC50 (Rat, male and female): > 2.5 mg/l
Exposure time: 6 h
Test atmosphere: vapour
GLP: yes
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.

Acute dermal toxicity : LD50 (Mouse, male and female): > 3,500 mg/kg

1,1,3,3-Tetramethylguanidine:

Acute oral toxicity : LD50 (Rat, male and female): 835 mg/kg
Method: OECD Test Guideline 401
Assessment: The component/mixture is moderately toxic after single ingestion.

1-Propanol, 2,2-dimethyl-, tribromo deriv.:

Acute oral toxicity : LD50 (Rat, female): > 2,000 mg/kg

Acute inhalation toxicity : Remarks: Not classified. Not a likely route of exposure.

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg
Remarks: No mortality was observed.

1,4-Dioxane:

Acute oral toxicity : LD50 (Rat, male and female): 5,150 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC50 (Rat, male and female): 155 mg/l
Exposure time: 1 h
Test atmosphere: vapour
Method: OECD Test Guideline 403

Stannane, dibutylbis(dodecylthio)-; Dibutylbis(dodecylthio)stannane:

Acute oral toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 423

Acute dermal toxicity : LD50 (Rabbit, female): > 1,000 - < 2,000 mg/kg
Method: OECD Test Guideline 402

Skin corrosion/irritation

Components:

1,1,3,3-Tetramethylguanidine:
Species: Rabbit

Exposure time: 1 h
Method: OECD Test Guideline 404
Result: Corrosive after 3 minutes to 1 hour of exposure

Skin corrosion/irritation

Stannane, dibutylbis(dodecylthio)-; Dibutylbis(dodecylthio)stannane:
Result: irritating

Serious eye damage/eye irritation

Components:

1,1,3,3-Tetramethylguanidine:
Species: Rabbit
Result: Irreversible effects on the eye
Exposure time: 1 h

Serious eye damage/eye irritation

Causes serious eye irritation.
1-Propanol, 2,2-dimethyl-, tribromo deriv.:
Species: Rabbit
Result: Irritation to eyes, reversing within 21 days
Method: OECD Test Guideline 405

Serious eye damage/eye irritation

Causes serious eye irritation.
1,4-Dioxane:
Result: Eye irritation

Respiratory or skin sensitisation

Components:

1,1,3,3-Tetramethylguanidine:
Result: Does not cause skin sensitisation.
Remarks: The value is given based on a SAR/AAR approach using OECD Toolbox, DEREK, VEGA QSAR models (CAESAR models), etc.

Respiratory or skin sensitisation

Stannane, dibutylbis(dodecylthio)-; Dibutylbis(dodecylthio)stannane:
Test Type: Maximisation Test
Exposure routes: Skin contact
Species: Guinea pig
Assessment: May cause sensitisation by skin contact.
Method: OECD Test Guideline 406
Remarks: Based on data from similar materials

Germ cell mutagenicity

Components:

1,1,3,3-Tetramethylguanidine:

Genotoxicity in vitro	:	Test Type: reverse mutation assay Test species: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471

Result: negative
GLP: yes

Germ cell mutagenicity

May cause genetic defects.
1-Propanol, 2,2-dimethyl-, tribromo deriv.:
Germ cell mutagenicity-Assessment : Positive result(s) from mutagenicity tests in mammals. Evidence that the substance has potential to cause mutations to germ cells

Germ cell mutagenicity

Stannane, dibutylbis(dodecylthio)-; Dibutylbis(dodecylthio)stannane:
Germ cell mutagenicity-Assessment : In vitro tests showed mutagenic effects

Carcinogenicity

Suspected of causing cancer if swallowed.

Components:

2-Propanol, 1-chloro-, 2,2',2''-phosphate; 2-Propanol, 1-chloro-, phosphate (3:1):
Species: Rat, (male and female)
Application Route: Oral
Method: NTP internal standards
Result: positive
GLP: yes

Species: Mouse, (male and female)
Application Route: Oral
Method: NTP internal standards
Result: positive
GLP: yes

Carcinogenicity - Assessment : Limited evidence of carcinogenicity in animal studies (oral)

Carcinogenicity

May cause cancer if swallowed.
May cause cancer by inhalation.
1,4-Dioxane:
Species: Rat
Application Route: Oral
NOAEL: No observed adverse effect level: 9.6 mg/kg bw/day

Target Organs: Liver, nasal cavity

Species: Rat, (male and female)
Application Route: inhalation (vapour)
NOAEL: No observed adverse effect level: > 400,000 µg/m3

LOAEL: Lowest observed adverse effect level: 180,000 µg/m3

Target Organs: nasal cavity

Carcinogenicity - Assessment : Sufficient evidence of carcinogenicity in animal experiments (oral), Sufficient evidence of carcinogenicity in inhalation studies with animals

IARC	Group 2B: Possibly carcinogenic to humans	
	1,4-Dioxane	123-91-1
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA (29 CFR 1910 Subpart Z, Toxic and Hazardous Substances).	
NTP	Reasonably anticipated to be a human carcinogen	
	1,4-Dioxane	123-91-1

Reproductive toxicity

Components:

1,1,3,3-Tetramethylguanidine:
Effects on fertility :

Species: Rat
Sex: male and female
Application Route: Oral
NOAEL: 100 mg/kg,
F1: 100 mg/kg

Reproductive toxicity

Stannane, dibutylbis(dodecylthio)-; Dibutylbis(dodecylthio)stannane:
Reproductive toxicity - Assessment : Clear evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments

STOT - single exposure

May cause respiratory irritation.

Components:

1,4-Dioxane:
Target Organs: Respiratory system
Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

STOT - repeated exposure

Components:

Ethylene glycol; 1,2-Ethanediol:
Exposure routes: Ingestion
Target Organs: Kidney
Assessment: Shown to produce significant health effects in animals at concentrations of >10 to 100 mg/kg bw.

STOT - repeated exposure

Stannane, dibutylbis(dodecylthio)-; Dibutylbis(dodecylthio)stannane:
Exposure routes: Ingestion
Target Organs: thymus
Assessment: Causes damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

1,1,3,3-Tetramethylguanidine:
Species: Rat, male and female
NOAEL: 100 mg/kg
Application Route: Oral
Exposure time: 28 d
Method: OECD Test Guideline 422
GLP: yes

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

1-Propene, 1-chloro-3,3,3-trifluoro-, (1E)-:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): ca. 38 mg/l End point: mortality Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 203
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (algae)): > 215 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201

2-Propanol, 1-chloro-, 2,2',2''-phosphate; 2-Propanol, 1-chloro-, phosphate (3:1):

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 51 mg/l Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 203 GLP: yes
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 131 mg/l End point: Immobilization Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 GLP: yes
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): 82 mg/l End point: Growth inhibition Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 GLP: yes Remarks: No toxicity at the limit of solubility
Toxicity to fish (Chronic toxicity)	:	NOEC: 5.2 mg/l Remarks: The value is given based on a SAR/AAR approach

using OECD Toolbox, DEREK, VEGA QSAR models (CAESAR models), etc.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 32 mg/l End point: mortality Exposure time: 21 d Test Type: semi-static test Method: OECD Test Guideline 211 GLP: yes
Toxicity to microorganisms	:	IC50 (activated sludge): 784 mg/l End point: Growth rate Exposure time: 3 h Test Type: Growth inhibition Method: ISO 8192 GLP: yes
Toxicity to soil dwelling organisms	:	LC50 (Eisenia fetida (earthworms)): 33 mg/kg Exposure time: 14 d Method: OECD Test Guideline 207 GLP: no

Ethanol, 2,2'-oxybis-; Diethylene glycol:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 75,200 mg/l End point: mortality Exposure time: 96 h Test Type: flow-through test
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 10,000 mg/l Exposure time: 24 h Test Type: static test Method: DIN 38412
Toxicity to algae/aquatic plants	:	EC10 (algae): 100 mg/l Remarks: The value is given based on a SAR/AAR approach using OECD Toolbox, DEREK, VEGA QSAR models (CAESAR models), etc.

1,1,3,3-Tetramethylguanidine:

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 GLP: yes
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 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): 350 mg/l Exposure time: 3 h Test Type: Respiration inhibition

Method: OECD Test Guideline 209
GLP: yes

1-Propanol, 2,2-dimethyl-, tribromo deriv.:

Toxicity to fish	:	LC50 (Cyprinus carpio (Carp)): 32 mg/l Exposure time: 96 h Test Type: static test
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 64 mg/l Exposure time: 48 h Test Type: acute toxicity test
Toxicity to algae/aquatic plants	:	EC50 (Raphidocelis subcapitata (freshwater green alga)): 28 mg/l Exposure time: 72 h Test Type: Growth inhibition Method: OECD Test Guideline 201 GLP: yes
Toxicity to fish (Chronic toxicity)	:	LC50 (Cyprinus carpio (Carp)): 5.6 mg/l Exposure time: 14 d Test Type: semi-static test Method: OECD Test Guideline 204 GLP: yes
Toxicity to microorganisms	:	EC50 (activated sludge): 400 mg/l Exposure time: 0.5 h Test Type: Respiration inhibition Method: OECD Test Guideline 209

1,4-Dioxane:

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 Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (algae)): > 1,000 mg/l Exposure time: 72 h Test Type: static test
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): > 103 mg/l End point: mortality Exposure time: 32 d
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 1,000 mg/l Exposure time: 21 d

Stannane, dibutylbis(dodecylthio)-; Dibutylbis(dodecylthio)stannane:

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.023 mg/l End point: Immobilization Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): >= 1.6 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Persistence and degradability

Components:

1-Propene, 1-chloro-3,3,3-trifluoro-, (1E)-:

Biodegradability : aerobic
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

2-Propanol, 1-chloro-, 2,2',2''-phosphate; 2-Propanol, 1-chloro-, phosphate (3:1):

Biodegradability : Result: Inherently biodegradable.

Result: Not readily biodegradable.

Ethanol, 2,2'-oxybis-; Diethylene glycol:

Biodegradability : aerobic
Result: Readily biodegradable.
Biodegradation: 90 - 100 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

Ethylene glycol; 1,2-Ethanediol:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 100 %

1,1,3,3-Tetramethylguanidine:

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Concentration: 4 mg/l
Result: Not readily biodegradable.
Biodegradation: 5.2 %
Exposure time: 28 d
Method: OECD Test Guideline 301D
GLP: yes

Stannane, dibutylbis(dodecylthio)-; Dibutylbis(dodecylthio)stannane:

Biodegradability : aerobic
Inoculum: activated sludge
Concentration: 34.3 mg/l
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301F
Remarks: Information taken from reference works and the literature.

Bioaccumulative potential

Components:

1-Propene, 1-chloro-3,3,3-trifluoro-, (1E)-:

Partition coefficient: n-octanol/water : log Pow: ca. 2.2 (77 °F / 25 °C)
pH: 7.4
Method: OECD Test Guideline 117

2-Propanol, 1-chloro-, 2,2',2''-phosphate; 2-Propanol, 1-chloro-, phosphate (3:1):

Bioaccumulation : Bioconcentration factor (BCF): 0.8 - < 14

Partition coefficient: n-octanol/water : log Pow: 2.68 (86 °F / 30 °C)

Ethanol, 2,2'-oxybis-; Diethylene glycol:

Bioaccumulation : Species: Leuciscus idus (Golden orfe)
Bioconcentration factor (BCF): 100
Exposure time: 3 d
Concentration: 0.05 mg/l

Partition coefficient: n-octanol/water : log Pow: -1.98 (68 °F / 20 °C)

Ethylene glycol; 1,2-Ethanediol:

Partition coefficient: n-octanol/water : log Pow: -1.36 (77 °F / 25 °C)

1,1,3,3-Tetramethylguanidine:

Partition coefficient: n-octanol/water : log Pow: -0.49 (68 °F / 20 °C)
Method: OECD Test Guideline 107

1-Propanol, 2,2-dimethyl-, tribromo deriv.:

Partition coefficient: n-octanol/water : log Pow: 2.6 (72.5 °F / 22.5 °C)

1,4-Dioxane:

Partition coefficient: n-octanol/water : log Pow: -0.42

Stannane, dibutylbis(dodecylthio)-; Dibutylbis(dodecylthio)stannane:

Partition coefficient: n-octanol/water : log Pow: 3.11 (72 °F / 22 °C)
pH: 6.1 - 6.7
Method: OECD Test Guideline 107

Mobility in soil

Components:

2-Propanol, 1-chloro-, 2,2',2''-phosphate; 2-Propanol, 1-chloro-, phosphate (3:1):

Distribution among environmental compartments : Koc: 324.2

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).

Additional ecological information : Toxic to aquatic life with long lasting effects.

Global warming potential

Global Warming Potentials - 40CFR Part 98 -Table A-1 to SubPart A.

Components:

1-Propene, 1-chloro-3,3,3-trifluoro-, (1E)-:
100-year global warming potential: 1.34
Further information: Unsaturated Hydrofluorocarbons (HFCs) and Hydrochlorofluorocarbons (HCFCs), This compound was added to Table A-1 in the final rule published on December 11, 2014, and effective on January 1, 2015.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International transport regulations

Land transport
USDOT: Not classified as a dangerous good under transport regulations

Sea transport
IMDG: Not classified as a dangerous good under transport regulations

Air transport
IATA/ICAO: Not classified as a dangerous good under transport regulations

SECTION 15. REGULATORY INFORMATION

TSCA list

TSCA - 5(a) Significant New Use Rule List of Chemicals : No substances are subject to a Significant New Use Rule.

U.S. Toxic Substances Control Act (TSCA) Section : No substances are subject to TSCA

12(b) Export Notification (40 CFR 707, Subpart D) 12(b) export notification requirements.

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Ethylene glycol; 1,2-Ethanediol	107-21-1	5000	> 50000
1,4-Dioxane	123-91-1	100	> 50000

SARA 304 Extremely Hazardous Substances Reportable Quantity

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

SARA 311/312 Hazards : Germ cell mutagenicity
Skin corrosion or irritation
Respiratory or skin sensitisation
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)
Serious eye damage or eye irritation
Carcinogenicity

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

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

Ethylene glycol; 1,2-Ethanediol	107-21-1	1 - 5 %
1,4-Dioxane	123-91-1	0.1 - 1 %

Clean Air Act

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

Ethanol, 2,2'-oxybis-; Diethylene glycol	111-46-6	1 - 5 %
Ethylene glycol; 1,2-Ethanediol	107-21-1	1 - 5 %

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 SOCMI Intermediate or Final VOC's (40 CFR 60.489):

Ethanol, 2,2'-oxybis-; Diethylene glycol	111-46-6	1 - 5 %
Ethylene glycol; 1,2-Ethanediol	107-21-1	1 - 5 %

Massachusetts Right To Know

Ethylene glycol; 1,2-Ethanediol	107-21-1
1,4-Dioxane	123-91-1

Pennsylvania Right To Know

1-Propene, 1-chloro-3,3,3-trifluoro-, (1E)-	102687-65-0
2-Propanol, 1-chloro-, 2,2',2''-phosphate; 2-Propanol, 1-chloro-,	13674-84-5

phosphate (3:1)	
Ethanol, 2,2'-oxybis-; Diethylene glycol	111-46-6
Ethylene glycol; 1,2-Ethanediol	107-21-1
1,1,3,3-Tetramethylguanidine	80-70-6
1-Propanol, 2,2-dimethyl-, tribromo deriv.	36483-57-5
1,4-Dioxane	123-91-1

California Prop. 65

WARNING: This product can expose you to chemicals including 1,4-Dioxane, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances

Ethylene glycol; 1,2-Ethanediol	107-21-1

California Permissible Exposure Limits for Chemical Contaminants

Ethylene glycol; 1,2-Ethanediol	107-21-1

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

TSCA : All substances listed as active on the TSCA inventory

SECTION 16. OTHER INFORMATION

Further information

Revision Date : 06/02/2025

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
US WEEL	:	USA. Workplace Environmental Exposure Levels (WEEL)
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit
ACGIH / C	:	Ceiling limit
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / C	:	Ceiling value not be exceeded at any time.
OSHA / TWA	:	8-hour time weighted average
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 Harmonized 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 Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; 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 - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; 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

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.