JM CORBOND® IV Closed-cell Spray Polyurethane Foam (cc SPF) – Component B (USA)

Version 3.1 Revision Date 05/21/2024 Print Date 05/21/2024

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Trade name	:	JM CORBOND® IV B Summer HI ALT LAV, JM CORBOND® IV B Summer LO ALT LAV, JM CORBOND® IV B Winter HI ALT LAV, JM CORBOND® IV B Winter LO ALT LAV

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)
Company	:	Johns Manville Canada Inc.
Address	:	5301 42 Avenue Innisfail, AB Canada T4G 1A2
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

Recommended use	:	thermal and/or acoustic insulation
Restrictions on use	:	For professional users only.
Prepared by	:	productsafety@jm.com

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200 and the Hazardous Products Regulations

Skin irritation	:	Category 2
Eye irritation	:	Category 2A
Skin sensitisation	:	Category 1
Reproductive toxicity	:	Category 1B
Specific target organ toxicity - repeated exposure	:	Category 2 (Pancreas)

GHS label elements

Hazard pictograms :

Signal word	:	Danger
Hazard statements	:	H315 Causes skin irritation.

H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H360 May damage fertility or the unborn child.
H373 May cause damage to organs (Pancreas) through prolonged or repeated exposure.

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 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 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)
tris(2-chloro-1-methylethyl) phosphate	13674-84-5	>= 10 - < 30
(2Z)-1,1,1,4,4,4-hexafluorobut-2-ene	692-49-9	>= 10 - < 30
diethylene glycol	111-46-6	>= 5 - < 10
diethylmethylbenzenediamine	68479-98-1	>= 1 - < 5
trans-dichloroethylene	156-60-5	>= 1 - < 5
4-Nonylphenol branched, ethoxylated	127087-87-0	>= 1 - < 5

tertiary amine catalyst (trade secret)	trade secret	>= 1 - < 5
tertiary amine catalyst (trade secret)	trade secret	>= 0.1 - < 1
organotin catalyst (trade secret)	trade secret	>= 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 has stopped, apply artificial respiration. If unconscious, place in recovery position and seek medical advice.
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. Wash contaminated clothing before re-use. Call a physician if irritation develops or persists.
In case of eye contact	:	In case of eye contact, remove contact lens and rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Protect unharmed eye. If eye irritation persists, consult a specialist.
If swallowed	:	Do NOT induce vomiting. Rinse mouth with water. Never give anything by mouth to an unconscious person. Obtain medical attention.
Most important symptoms and effects, both acute and delayed	:	Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May damage fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure.
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 phosphorus oxides Hydrogen chloride gas fluorine compounds

Hydrogen fluoride
Nitrogen
olefins
chlorine compounds
phenol
nitrogen oxides

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	:	Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. Smoking, eating and drinking should be prohibited in the application area. 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 - 80 °F / 10 - 27 °C
Further information on storage stability	:	Keep containers dry and tightly closed to avoid moisture absorption and contamination. Protect from heat, freezing and ultraviolet light .

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type	Control	Basis

		(Form of exposure)	parameters / Permissible concentration	
(2Z)-1,1,1,4,4,4-hexafluorobut-2-ene	692-49-9	TWA	500 ppm 3,350 mg/m3	US WEEL
diethylene glycol	111-46-6	TWA	10 mg/m3	US WEEL
trans-dichloroethylene	156-60-5	TWA	200 ppm	ACGIH
organotin catalyst (trade secret)	trade secret	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

Johns Manville is a member of the Center for the Polyurethanes Industry (CPI) of the American Chemistry Council. For more information about safe work practices, see CPI's *Health and Safety Product Stewardship Workbook for High-Pressure Application of Spray Polyurethane Foam (SPF)* and other resources (some available in Spanish and French) at the following website hyperlinks: https://www.spraypolyurethane.org/resources/ and https://www.spraypolyurethane.org/additional-resources/.

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 : Impervious 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	:	viscous liquid
Colour	:	lavender
Odour	:	amine-like
Odour Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	No data available
Flash point	:	> 93.4 °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	:	No data available
Water solubility	:	No data available
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	:	650 mPa.s (24 °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	:	In case of fire hazardous decomposition products may be produced such as: carbon oxides nitrogen oxides

chlorine compounds
fluorine compounds
Phosphorus compounds
Hydrogen chloride gas
Hydrogen fluoride

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	:	Acute toxicity estimate : > 2,000 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Acute toxicity estimate : > 40 mg/l Exposure time: 4 h Test atmosphere: vapour Method: Calculation method
Acute dermal toxicity	:	Acute toxicity estimate : > 5,000 mg/kg Method: Calculation method

Components:

tris(2-chloro-1-methylethyl) phosphate:

Acute oral toxicity	:	LD50 (Rat, female): ca. 707 mg/kg Method: OECD Test Guideline 401
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

(2Z)-1,1,1,4,4,4-hexafluorobut-2-ene:

Acute inhalation toxicity	:	LC50 (Rat, male and female): 690.413 mg/l Exposure time: 4 h Test atmosphere: vapour Method: OECD Test Guideline 403

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

diethylmethylbenzenediamine:

Acute oral toxicity : LD50 (Rat, male): 723 mg/kg
Method: OECD Test Guideline 401
GLP: yes

Acute inhalation toxicity : LC50 (Rat, male and female): > 2.45 mg/l
Exposure time: 1 h
Test atmosphere: dust/mist
GLP: no
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: No mortality was observed.

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
GLP: yes
Remarks: No mortality was observed.

trans-dichloroethylene:

Acute oral toxicity : LD50 (Rat, male): 7,902 mg/kg
Method: Fixed Dose Method

Acute inhalation toxicity : LC50 (Rat): 24100 ppm
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit, male and female): > 5,000 mg/kg
Method: OECD Test Guideline 402

4-Nonylphenol branched, ethoxylated:

Acute oral toxicity : LD50 (Rabbit, male and female): 657.2 mg/kg

Acute inhalation toxicity : Assessment: The substance or mixture has no acute inhalation toxicity

tertiary amine catalyst (trade secret):

Acute oral toxicity : LD50 (Rat, female): 1,389.36 mg/kg
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat, male): 992.4 mg/kg
Method: OECD Test Guideline 402

tertiary amine catalyst (trade secret):

Acute oral toxicity : LD50 (Rat, male): ca. 2,382.88 mg/kg

Acute inhalation toxicity : LC50 (Rat, female): 1.8 mg/l
Exposure time: 4 h
Test atmosphere: vapour

Acute dermal toxicity : LD50 (Rabbit, female): 1,171 mg/kg

organotin catalyst (trade secret):

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:

tertiary amine catalyst (trade secret):
Species: Rabbit
Method: OECD Test Guideline 404
Result: Corrosive after 3 minutes to 1 hour of exposure

Skin corrosion/irritation

tertiary amine catalyst (trade secret):
Species: Rabbit
Result: Causes burns.

Skin corrosion/irritation

organotin catalyst (trade secret):
Result: irritating

Serious eye damage/eye irritation

Components:

diethylmethylbenzenediamine:
Species: Rabbit
Result: Irritation to eyes, reversing within 21 days
Method: Draize Test
GLP: no

Serious eye damage/eye irritation

trans-dichloroethylene:
Species: Rabbit
Result: irritating
Method: OECD Test Guideline 405

Serious eye damage/eye irritation

4-Nonylphenol branched, ethoxylated:
Species: Rabbit
Result: irritating

Serious eye damage/eye irritation

tertiary amine catalyst (trade secret):
Species: Rabbit
Result: Risk of serious damage to eyes.
Method: OECD Test Guideline 405

Serious eye damage/eye irritation

tertiary amine catalyst (trade secret):
Species: Rabbit

Result: Irreversible effects on the eye

Respiratory or skin sensitisation

Components:

diethylmethylbenzenediamine:

Respiratory or skin sensitisation

organotin catalyst (trade secret):
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:

organotin catalyst (trade secret):

Germ cell mutagenicity-Assessment	:	In vitro tests showed mutagenic effects
IARC		No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
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		No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Components:

organotin catalyst (trade secret):

Reproductive toxicity - Assessment	:	Clear evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments

STOT - single exposure

Components:

trans-dichloroethylene:
Exposure routes: inhalation (vapour)
Target Organs: Central nervous system
Assessment: May cause drowsiness or dizziness.

STOT - repeated exposure

Components:

diethylmethylbenzenediamine:
Target Organs: Pancreas
Assessment: Shown to produce significant health effects in animals at concentrations of >10 to 100 mg/kg bw.

STOT - repeated exposure

organotin catalyst (trade secret):
Exposure routes: Ingestion
Target Organs: thymus
Assessment: Causes damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

diethylmethylbenzenediamine:
Species: Rat, male
NOAEL: 21 mg/kg
Application Route: Ingestion
Method: OECD Test Guideline 408
GLP: yes
Target Organs: Pancreas

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

tris(2-chloro-1-methylethyl) phosphate:

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

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.

diethylmethylbenzenediamine:

Toxicity to fish	:	LC50 (Leuciscus idus (Golden orfe)): 200.0 mg/l Exposure time: 48 h Method: DIN 38412
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna (Water flea)): 0.5 mg/l Exposure time: 48 h Method: Regulation (EC) No. 440/2008, Annex, C.2
Toxicity to algae/aquatic plants	:	ErC50 (algae): 104 mg/l Exposure time: 72 h Test Type: Growth inhibition

Ecotoxicology Assessment

Acute aquatic toxicity	:	Very toxic to aquatic life.

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

trans-dichloroethylene:

Toxicity to fish	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): 135 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 220 mg/l Exposure time: 48 h Test Type: static test
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (algae)): 36.36 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 201

4-Nonylphenol branched, ethoxylated:

Toxicity to fish	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): ca. 84.7 mg/l End point: mortality Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 203 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	:	EC50 (Daphnia magna (Water flea)): ca. 23.066 mg/l End point: Immobilization Exposure time: 48 h Test Type: static test Remarks: The value is given based on a SAR/AAR approach using OECD Toolbox, DEREK, VEGA QSAR models (CAESAR models), etc.
Toxicity to algae/aquatic plants	:	EC50 (Desmodesmus subspicatus (green algae)): ca. 19.485 mg/l End point: Growth inhibition Exposure time: 72 h Test Type: static test Remarks: The value is given based on a SAR/AAR approach using OECD Toolbox, DEREK, VEGA QSAR models (CAESAR models), etc.

tertiary amine catalyst (trade secret):

Toxicity to fish	:	LC50 (Danio rerio (zebra fish)): ca. 92.5 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)): 31.0 mg/l End point: Immobilization Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (algae)): 34.99 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 NOEC (Pseudokirchneriella subcapitata (algae)): 25 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 2.2 mg/l Exposure time: 21 d Test Type: semi-static test Method: OECD Test Guideline 211

tertiary amine catalyst (trade secret):

Toxicity to fish	:	LC50 (Danio rerio (zebra fish)): ca. 92.5 mg/l End point: mortality Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 203 Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 48 mg/l End point: Immobilization Exposure time: 48 h Test Type: semi-static test Method: Regulation (EC) No. 440/2008, Annex, C.2
Toxicity to algae/aquatic plants	:	EC50 (Desmodesmus subspicatus (green algae)): 74.9 mg/l Exposure time: 72 h Test Type: static test Method: Regulation (EC) No. 440/2008, Annex, C.3

organotin catalyst (trade secret):

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:

diethylene glycol:

Biodegradability	:	aerobic Result: Readily biodegradable.

Biodegradation: 90 - 100 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

diethylmethylbenzenediamine:

Biodegradability : Result: Not readily biodegradable.

trans-dichloroethylene:

Biodegradability : aerobic
Inoculum: activated sludge
Biodegradation: 93 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

4-Nonylphenol branched, ethoxylated:

Biodegradability : Result: Readily biodegradable.

tertiary amine catalyst (trade secret):

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Result: Not readily biodegradable.
Biodegradation: > 0 - < 10 %
Exposure time: 42 d
Method: OECD Test Guideline 301A

tertiary amine catalyst (trade secret):

Biodegradability : Inoculum: activated sludge
Concentration: 100 mg/l
Result: Not readily biodegradable.
Biodegradation: 0.9 %
Exposure time: 28 d
Method: OECD Test Guideline 301C

organotin catalyst (trade secret):

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:

tris(2-chloro-1-methylethyl) phosphate:

Partition coefficient: n-octanol/water : log Pow: 2.68

(2Z)-1,1,1,4,4,4-hexafluorobut-2-ene:

Partition coefficient: n-octanol/water	:	log Pow: 2.3 (86 °F / 30 °C) pH: 6.1 Method: OECD Test Guideline 117

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)

diethylmethylbenzenediamine:

Partition coefficient: n-octanol/water	:	log Pow: 1.38 (77 °F / 25 °C)

trans-dichloroethylene:

Partition coefficient: n-octanol/water	:	log Pow: 2.06

4-Nonylphenol branched, ethoxylated:

Partition coefficient: n-octanol/water	:	log Pow: 5.669 (77 °F / 25 °C) pH: 7.5 Method: OECD Test Guideline 117

tertiary amine catalyst (trade secret):

Partition coefficient: n-octanol/water	:	log Pow: 0 - 0.05 (77 °F / 25 °C) pH: 12.2

organotin catalyst (trade secret):

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

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).
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:

(2Z)-1,1,1,4,4,4-hexafluorobut-2-ene:
100-year global warming potential: 1.58
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
TDG: 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	:	The following substance(s) is/are subject to a Significant New Use Rule: (2Z)-1,1,1,4,4,4-hexafluorobut-2-ene
U.S. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpart D)	:	The following substance(s) is/are subject to TSCA 12(b) export notification requirements: (2Z)-1,1,1,4,4,4-hexafluorobut-2-ene

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

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
ethylene oxide	75-21-8	10	> 50000

SARA 304 Extremely Hazardous Substances Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
ethylene oxide	75-21-8	10	> 50000

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

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

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

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

diethylene glycol 111-46-6 5 - 10 %

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):

diethylene glycol 111-46-6 5 - 10 %

California Prop. 65

⚠**WARNING:** This product can expose you to chemicals including ethylene oxide, which is/are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

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

TSCA : All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.

DSL : On the inventory, or in compliance with the inventory

SECTION 16. OTHER INFORMATION

Further information

Revision Date : 05/21/2024

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
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
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.