

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard

HUNTSMAN

Enriching lives through innovation

JEFFCAT® ZF-10

Version	Revision Date:	SDS Number:	Date of last issue: 10/27/2021
3.0	05/19/2025	400001000344	Date of first issue: 12/02/2015

Print Date 09/22/2025

SECTION 1. IDENTIFICATION

Product name : JEFFCAT® ZF-10

Manufacturer or supplier's details

Company name of supplier : Huntsman International LLC
Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)
Telephone : TechInfo: (281) 719-7780
E-mail address : Global_Product_EHS_HPP@huntsman.com
Emergency telephone : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Component of a Polyurethane System.

SECTION 2. HAZARDS IDENTIFICATION

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

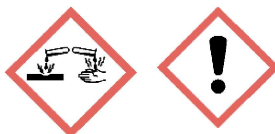
Acute toxicity (Oral) : Category 4
Skin corrosion : Category 1C
Serious eye damage : Category 1
Short-term (acute) aquatic hazard : Category 3

Other hazards

None known.

GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H402 Harmful to aquatic life.

Precautionary Statements : **Prevention:**

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P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
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.
P363 Wash contaminated clothing 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.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance
Chemical nature : Amines

Hazardous ingredients

Chemical name	CAS-No.	Concentration (% w/w)
2-[(2-[2-(dimethylamino)ethoxy]ethyl)methylamino]ethanol	83016-70-0	90 - 100

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

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Consult a physician.
Show this material safety data sheet to the doctor in attendance.
Treat symptomatically.
Get medical attention if symptoms occur.

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If inhaled	:	If inhaled, remove to fresh air. Get medical attention if symptoms occur.
In case of skin contact	:	Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	:	Small amounts splashed into eyes can cause irreversible tissue damage and blindness. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Continue rinsing eyes during transport to hospital. Remove contact lenses. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Clean mouth with water and drink afterwards plenty of water. Keep respiratory tract clear. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.
Most important symptoms and effects, both acute and delayed	:	Harmful if swallowed. Causes serious eye damage. Causes severe burns.
Protection of first-aiders	:	First Aid responders should pay attention to self-protection and use the recommended protective clothing If potential for exposure exists refer to Section 8 for specific personal protective equipment. Avoid inhalation, ingestion and contact with skin and eyes. No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
Notes to physician	:	Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO ₂) Dry chemical
Unsuitable extinguishing media	:	Exercise caution when using a high volume water jet as it may scatter and spread fire
Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Carbon oxides Nitrogen oxides (NO _x)
Specific extinguishing	:	Use extinguishing measures that are appropriate to local

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methods	:	circumstances and the surrounding environment.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Neutralize with acid. 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	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Do not breathe vapors/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. To avoid spills during handling keep bottle on a metal tray. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Keep in properly labeled containers.
Materials to avoid	:	Do not store near acids.
Further information on storage stability	:	Stable under normal conditions.

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SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

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
Guideline : Use gloves approved to relevant standards e.g. EN 16523 (Europe), EN 374 (Europe), F739 (US).

Material : Ansell 02-100 (5 layer laminated - single use)

Break through time : > 480 min

Glove thickness : 0.065 mm

Material : Nitrile rubber

Break through time : > 480 min

Glove thickness : 0.4 mm

Material : PVC coated

Break through time : > 480 min

Glove thickness : 1.63 mm

Material : Nitrile coated

Break through time : > 480 min

Glove thickness : 1.1 mm

Remarks : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures : When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Color	: light yellow
Odor	: amine-like
Odor Threshold	: No data is available on the product itself.
pH	: 11
Melting point	: -63 °F / -53 °C Method: OECD Test Guideline 102
Boiling point	: 505 °F / 263 °C (1,013 hPa) Method: OECD Test Guideline 103
Flash point	: 245.3 °F / 118.5 °C Method: Pensky-Martens closed cup
Evaporation rate	: No data is available on the product itself.
Flammability (solid, gas)	: No data is available on the product itself.
Flammability (liquids)	: No data is available on the product itself.
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available
Vapor pressure	: 0.12 hPa (77 °F / 25 °C) Method: OECD Test Guideline 104
Relative vapor density	: 1
Relative density	: 0.95 (68 °F / 20 °C) Method: OECD Test Guideline 109
Density	: 0.95 g/cm3
Solubility(ies)	
Water solubility	: 570 g/l completely miscible (75 °F / 24 °C)
Solubility in other solvents	: not determined
Partition coefficient: n-octanol/water	: log Pow: -0.48 (79 °F / 26 °C) Method: OECD Test Guideline 107
Autoignition temperature	: 439 °F / 226 °C

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Decomposition temperature	: No data is available on the product itself.
Self-Accelerating decomposition temperature (SADT)	: No data is available on the product itself.
Viscosity	: No data is available on the product itself.
Explosive properties	: No data is available on the product itself.
Oxidizing properties	: None.
Molecular weight	: 190.29 g/mol
Metal corrosion rate	: Not corrosive to metals.
Particle size	: No data is available on the product itself.

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	: No hazards to be specially mentioned.
Conditions to avoid	: None known.
Incompatible materials	: None known.
Hazardous decomposition products	: No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Harmful if swallowed.

Product:

Acute oral toxicity	: Acute toxicity estimate: 1,390 mg/kg Method: Calculation method
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Components:

2-[(2-[2-(dimethylamino)ethoxy]ethyl)methylamino]ethanol:

Acute oral toxicity	: LD50 (Rat, male and female): 1,364 mg/kg Method: OECD Test Guideline 401 Assessment: The component/mixture is moderately toxic after single ingestion.
Acute dermal toxicity	: LD50 (Rabbit, male and female): 5,700 mg/kg Method: OECD Test Guideline 402 GLP: yes Assessment: The substance or mixture has no acute dermal toxicity

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Skin corrosion/irritation

Causes severe burns.

Components:

2-[(2-[2-(dimethylamino)ethoxy]ethyl)methylamino]ethanol:

Species	:	in vitro membrane barrier
Method	:	OECD Test Guideline 435
Result	:	Corrosive after 1 to 4 hours of exposure
GLP	:	yes

Serious eye damage/eye irritation

Causes serious eye damage.

Components:

2-[(2-[2-(dimethylamino)ethoxy]ethyl)methylamino]ethanol:

Species	:	Rabbit
Result	:	Risk of serious damage to eyes.
Assessment	:	Risk of serious damage to eyes.
Method	:	OECD Test Guideline 405
GLP	:	yes

Respiratory or skin sensitisation

Skin sensitisation

Not classified due to lack of data.

Respiratory sensitisation

Not classified due to lack of data.

Components:

2-[(2-[2-(dimethylamino)ethoxy]ethyl)methylamino]ethanol:

Test Type	:	Maximisation Test
Exposure routes	:	Skin
Species	:	Guinea pig
Assessment	:	Did not cause sensitisation on laboratory animals.
Method	:	OECD Test Guideline 406
Result	:	Did not cause sensitisation on laboratory animals.
GLP	:	yes

Germ cell mutagenicity

Not classified due to lack of data.

Components:

2-[(2-[2-(dimethylamino)ethoxy]ethyl)methylamino]ethanol:

Genotoxicity in vitro	:	Test Type: reverse mutation assay
		Test system: Salmonella typhimurium
		Concentration: .167 - 10 mg/plate
		Metabolic activation: with and without metabolic activation
		Method: OECD Test Guideline 471
		Result: negative
		GLP: yes

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Test Type: unscheduled DNA synthesis assay
Test system: rat hepatocytes
Concentration: .16 - 5000 µg/L
Metabolic activation: negative
Method: OECD Test Guideline 482
Result: negative

Test Type: Chromosome aberration test in vitro
Test system: Human lymphocytes
Concentration: 9.8 - 5000 µg/L
Metabolic activation: Metabolic activation
Method: OECD Test Guideline 473
Result: Not classified due to inconclusive data.
GLP: yes

Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: yes
Remarks: Information given is based on data obtained from similar substances.

Test Type: in vitro test
Test system: Rodent cell line
Metabolic activation: without metabolic activation
Result: negative

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse (male and female)
Cell type: Somatic
Application Route: Oral
Dose: 1480 mg/kg
Method: OECD Test Guideline 474
Result: negative
GLP: yes

Carcinogenicity

Not classified due to lack of data.

IARC No ingredient 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 on OSHA's list of regulated carcinogens.

NTP No ingredient 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

Not classified due to lack of data.

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Components:

2-[(2-[2-(dimethylamino)ethoxy]ethyl)methylamino]ethanol:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
General Toxicity Parent: NOAEL: > 100 mg/kg body weight
General Toxicity F1: NOAEL: > 100 mg/kg body weight
Method: OECD Test Guideline 415
Result: negative
GLP: yes

Effects on fetal development : Test Type: Pre-natal
Species: Rabbit
Application Route: Dermal
Dose: 2.4/12/24 mg/kg
Duration of Single Treatment: 13 d
General Toxicity Maternal: NOAEL: 2.4 - < 12 mg/kg body weight
Teratogenicity: NOAEL: >= 24 mg/kg body weight
Embryo-fetal toxicity.: NOAEL: >= 24 mg/kg body weight
Method: OECD Test Guideline 414
Remarks: Information given is based on data obtained from similar substances.

STOT-single exposure

Not classified due to lack of data.

STOT-repeated exposure

Not classified due to lack of data.

Repeated dose toxicity

Components:

2-[(2-[2-(dimethylamino)ethoxy]ethyl)methylamino]ethanol:

Species : Rat, male and female
NOAEL : > 100 mg/kg
Application Route : oral (gavage)
Exposure time : 13 weeks 91 d
Number of exposures : 7 d/w
Dose : 1/10/100 mg/kg bw/day
Method : OECD Test Guideline 408

Aspiration toxicity

Not classified due to lack of data.

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

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Further information

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

2-[(2-[2-(dimethylamino)ethoxy]ethyl)methylamino]ethanol:

Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): > 320 mg/l End point: mortality Exposure time: 96 h Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 203 GLP: yes
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 72 mg/l End point: Immobilization Exposure time: 48 h Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 202 GLP: yes
Toxicity to algae/aquatic plants	: ErC50 (Selenastrum capricornutum (green algae)): > 110 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201 GLP: yes NOECr (Selenastrum capricornutum (green algae)): 29.3 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201 GLP: yes
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC (Daphnia magna (Water flea)): 1.9 mg/l Exposure time: 28 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211 GLP: yes
Toxicity to microorganisms	: IC50 (activated sludge): > 100 mg/l Exposure time: 3 h Test substance: Fresh water Method: OECD Test Guideline 209 GLP: yes

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Persistence and degradability

Components:

2-[(2-[2-(dimethylamino)ethoxy]ethyl)methylamino]ethanol:

Biodegradability : aerobic
Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 1 %
Exposure time: 28 d
Method: OECD Test Guideline 301D
GLP: yes

Stability in water : Degradation half life (DT50): > 1 yr (25 °C) pH: 9
Method: OECD Test Guideline 111
GLP: yes

Degradation half life (DT50): > 1 yr (25 °C) pH: 4

Bioaccumulative potential

Components:

2-[(2-[2-(dimethylamino)ethoxy]ethyl)methylamino]ethanol:

Partition coefficient: n-octanol/water : log Pow: -0.48 (79 °F / 26 °C)
Method: OECD Test Guideline 107
GLP: yes

Mobility in soil

Components:

2-[(2-[2-(dimethylamino)ethoxy]ethyl)methylamino]ethanol:

Distribution among environmental compartments : Koc: 11754
Method: OECD Test Guideline 121

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 : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.
Harmful to aquatic life with long lasting effects.

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SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Dispose of contents and container in accordance with all local, regional, national and international regulations. Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	UN 2735
Proper shipping name	:	AMINES, LIQUID, CORROSIVE, N.O.S. (2-(2-(2-DIMETHYLAMINOETHOXY)-ETHYLMETHYLAMINO)-ETHANOL)
Class	:	8
Packing group	:	III
Labels	:	8
Environmentally hazardous	:	no

IATA-DGR

UN/ID No.	:	UN 2735
Proper shipping name	:	Amines, liquid, corrosive, n.o.s. (2-(2-(2-DIMETHYLAMINOETHOXY)-ETHYLMETHYLAMINO)-ETHANOL)
Class	:	8
Packing group	:	III
Labels	:	Corrosive
Packing instruction (cargo aircraft)	:	856
Packing instruction (passenger aircraft)	:	852

IMDG-Code

UN number	:	UN 2735
Proper shipping name	:	AMINES, LIQUID, CORROSIVE, N.O.S. (2-(2-(2-DIMETHYLAMINOETHOXY)-ETHYLMETHYLAMINO)-ETHANOL)
Class	:	8
Packing group	:	III
Labels	:	8
EmS Code	:	F-A, S-B
Marine pollutant	:	no

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

Domestic regulation

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49 CFR

UN/ID/NA number	:	UN 2735
Proper shipping name	:	Amines, liquid, corrosive, n.o.s. (2-(2-(2-DIMETHYLAMINOETHOXY)- ETHYLMETHYLAMINO)-ETHANOL)
Class	:	8
Packing group	:	III
Labels	:	CORROSIVE
ERG Code	:	153
Marine pollutant	:	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

This material does not contain any components with a CERCLA RQ.

SARA 311/312 Hazards	:	Acute toxicity (any route of exposure) Serious eye damage or eye irritation Skin corrosion or irritation
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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.
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This product does not contain any hazardous air pollutants (HAP) $\geq 0.1\%$, as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

DSL	:	All components of this product are on the Canadian DSL
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TSCA	:	All substances listed as active on the TSCA inventory
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TSCA - 5(a) Significant New Use Rule List of Chemicals

No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

No substances are subject to TSCA 12(b) export notification requirements.

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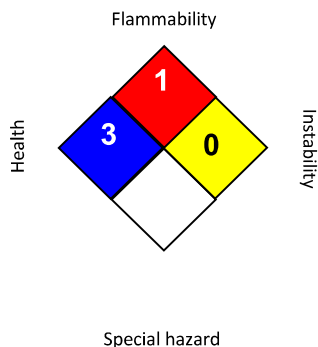
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SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:

HEALTH		3
FLAMMABILITY		1
PHYSICAL HAZARD		0

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "***" represents a chronic hazard, while the "/" represents the absence of a chronic hazard

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The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

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THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

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