

JEFFCAT® ZF 20

Version	Revision Date:	SDS Number:	Date of last issue:
1.4	03/07/2022	400001000079	06/11/2021
			Date of first issue: 04/24/2017

Print Date 07/04/2024

SECTION 1. IDENTIFICATION

Product name : JEFFCAT® ZF 20

Manufacturer or supplier's details

Company name of supplier	: Huntsman International LLC
Address	: 870 Curé-Boivin Boisbriand, Québec J7G 2A7, Canada
Telephone	: +1 450 437 0123, Cust ser: (281) 719-7780
E-mail address of person responsible for the SDS	: Global_Product_EHS_HPP@huntsman.com
Emergency telephone number	: Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use	: Component of a Polyurethane System.
Restrictions on use	: For industrial use only.

SECTION 2. HAZARDS IDENTIFICATION**GHS classification in accordance with the Hazardous Products Regulations**

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

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : H227 Combustible liquid.

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H302 + H332 Harmful if swallowed or if inhaled.
H311 Toxic in contact with skin.
H314 Causes severe skin burns and eye damage.
H402 Harmful to aquatic life.

Precautionary statements

: **Prevention:**

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261 Avoid breathing mist or vapours.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

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.
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.
P361 + P364 Take off immediately all contaminated clothing and wash it before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

P403 Store in a well-ventilated place.
P405 Store locked up.

Disposal:

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

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine)	3033-62-3	80 - 100

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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 safety data sheet to the doctor in attendance.
Symptoms of poisoning may appear several hours later.
Treat symptomatically.
Get medical attention if symptoms occur. |
| 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.
Take victim immediately to hospital.
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 | : Blurred vision |
| 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. |

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Notes to physician : Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
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 : No hazardous combustion products are known
- Specific extinguishing methods : No data is available on the product itself.
- 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.
For safety reasons in case of fire, cans should be stored separately in closed containments.
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 : 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 : Neutralise with acid.
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
Keep in suitable, closed containers for disposal.

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SECTION 7. HANDLING AND STORAGE

- Advice on protection against fire and explosion : Do not spray on a naked flame or any incandescent material. Keep away from open flames, hot surfaces and sources of ignition.
- Advice on safe handling : Do not breathe vapours/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 : Prevent unauthorized access. No smoking. Keep in a well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Keep in properly labelled containers.
- Materials to avoid : Do not store near acids.
- Further information on storage stability : Stable under normal conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters**

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine)	3033-62-3	TWA	0.05 ppm 0.3 mg/m ³	CA AB OEL
		STEL	0.15 ppm 0.98 mg/m ³	CA AB OEL
		TWA	0.05 ppm	CA BC OEL
		STEL	0.15 ppm	CA BC OEL
		TWA	0.05 ppm	ACGIH
		STEL	0.15 ppm	ACGIH

Personal protective equipment

- Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines
- Filter type : Organic vapour type
- Hand protection
- Remarks : Chemical-resistant, impervious gloves complying with an

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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	: Avoid contact with skin, eyes and clothing. When using do not eat or drink. When using do not smoke. Wash hands before breaks and immediately after handling the product.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Colour	: light yellow
Odour	: ammoniacal
Odour Threshold	: No data is available on the product itself.
pH	: 11.6
Melting point	: < -20 °C
Boiling point	: 189.9 °C (1,013 hPa)
Flash point	: 68 °C Method: 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 is available on the product itself.
Lower explosion limit / Lower flammability limit	: No data is available on the product itself.
Vapour pressure	: 0.49 hPa (20 °C)

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Relative vapour density	: 1
Relative density	: 0.85 (20 °C)
Density	: 0.85 g/cm ³ (20 °C)
Solubility(ies)	
Water solubility	: 1,000 g/l completely miscible (20 °C)
Solubility in other solvents	: Solvent: Methanol Description: soluble
Partition coefficient: n-octanol/water	: log Pow: -0.34 (20 °C)
Auto-ignition temperature	: 158 °C
Decomposition temperature	: No data is available on the product itself.
Self-Accelerating decomposition temperature (SADT)	: No data is available on the product itself.
Viscosity	
Viscosity, dynamic	: < 20 mPa.s (20 °C)
Explosive properties	: No data is available on the product itself.
Oxidizing properties	: No data is available on the product itself.
Molecular weight	: 160.3 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	: Vapours may form explosive mixture with air.
Conditions to avoid	: Heat, flames and sparks.
Incompatible materials	: Strong acids and oxidizing agents
Hazardous decomposition products	: No hazardous decomposition products are known.

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SECTION 11. TOXICOLOGICAL INFORMATION**Acute toxicity****Product:**

Acute oral toxicity : Acute toxicity estimate: 681.09 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: 11.07 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: 315.9 mg/kg
Method: Calculation method

Components:**N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine):**

Acute oral toxicity : LD50 (Rat, male and female): 677 mg/kg
Method: OECD Test Guideline 401
GLP: yes
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : LC50 (Rat, male and female): 4 mg/l
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
GLP: no
Assessment: The component/mixture is moderately toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rabbit, male and female): 314 mg/kg
Method: OECD Test Guideline 402
GLP: yes
Assessment: The component/mixture is toxic after single contact with skin.

Skin corrosion/irritation**Components:****N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine):**

Species : Rabbit
Method : OECD Test Guideline 404
Result : Causes burns.

Species : Rabbit
Assessment : Causes burns.
Method : OECD Test Guideline 404
Result : Causes burns.
GLP : yes

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Serious eye damage/eye irritation**Components:****N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine):**

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**Components:****N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine):**

Test Type	:	Buehler 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**Components:****N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine):**

Genotoxicity in vitro	:	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
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	:	Test Type: reverse mutation assay Test system: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative GLP: yes
--	---	--

	:	Test Type: sister chromatid exchange assay Test system: Chinese hamster ovary cells Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 479 Result: Not classified due to inconclusive data.
--	---	--

	:	Test Type: unscheduled DNA synthesis assay Test system: rat hepatocytes Metabolic activation: negative Method: OECD Test Guideline 482 Result: negative
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Genotoxicity in vivo	:	Test Type: In vivo micronucleus test Species: Mouse (male and female) Cell type: Bone marrow
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Application Route: Intraperitoneal injection

Dose: 45 - 145 mg/kg

Method: OECD Test Guideline 474

Result: negative

GLP: yes

Carcinogenicity

No data available

Reproductive toxicity**Components:****N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine):**

Effects on foetal development	:	Test Type: Pre-natal
	:	Species: Rabbit
	:	Application Route: Dermal
	:	Dose: 0, 1, 5 and 10 %
	:	Duration of Single Treatment: 13 d
	:	General Toxicity Maternal: NOAEL: 12 mg/kg body weight
	:	Method: OECD Test Guideline 414
	:	GLP: no

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity**Components:****N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine):**

Species	:	Rat, male and female
NOEC	:	8.2 mg/m3
Application Route	:	Inhalation
Test atmosphere	:	vapour
Exposure time	:	14 weeks 6 h
Number of exposures	:	5 days/week
Dose	:	1.51/8.2/38 mg/m3
Method	:	OECD Test Guideline 413
GLP	:	yes

Species	:	Rabbit, male and female
NOAEL	:	8 mg/kg
Application Route	:	Dermal
Exposure time	:	90 days 6 h
Number of exposures	:	5 days/week
Method	:	OECD Test Guideline 411
GLP	:	yes

Aspiration toxicity

No data available

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Experience with human exposure**Components:****N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine):**

Eye contact : Symptoms: Blurred vision

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity****Components:****N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine):**

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): ca. 131.2 mg/l
End point: mortality
Exposure time: 96 h
Test Type: semi-static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 203
GLP: yes

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 102 mg/l
aquatic invertebrates
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/aquatic : ErC50 (Selenastrum capricornutum (green algae)): 23 mg/l
plants
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

NOECr (Selenastrum capricornutum (green algae)): 1.83 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

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Toxicity to microorganisms : EC20 (activated sludge): > 720 mg/l
Exposure time: 0.5 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209
GLP: no

Ecotoxicology Assessment

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

Persistence and degradability**Components:****N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine):**

Biodegradability : aerobic
Inoculum: activated sludge
Concentration: 400 mg/l
Dissolved organic carbon (DOC)
Result: Not biodegradable
Biodegradation: < 10 %
Exposure time: 28 d
Method: OECD Test Guideline 302B
GLP: no

aerobic
Inoculum: activated sludge
Concentration: 100 mg/l
Theoretical oxygen demand
Result: Not readily biodegradable.
Biodegradation: 2 %
Exposure time: 28 d
Method: OECD Test Guideline 301F
GLP: no

Bioaccumulative potential**Components:****N,N,N',N'-tetramethyl-2,2'-oxybis(ethylamine):**

Bioaccumulation : Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: -0.34 (20 °C)
pH: 5 - 9
Method: Partition coefficient
GLP: yes

log Pow: -0.54

Mobility in soil

No data available

Other adverse effects**Product:**

Additional ecological : An environmental hazard cannot be excluded in the event of

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information

unprofessional handling or disposal.
Harmful to aquatic life.**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**

- | | |
|------------------------|---|
| Waste from residues | : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.
Dispose of as hazardous waste in compliance with local and national regulations.
Dispose of contents/ container to an approved waste disposal plant. |
| Contaminated packaging | : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum. |

SECTION 14. TRANSPORT INFORMATION**International Regulations****IATA-DGR**

- | | |
|--|---|
| UN/ID No. | : UN 2922 |
| Proper shipping name | : Corrosive liquid, toxic, n.o.s.
(BIS(DIMETHYLAMINOETHYL)ETHER) |
| Class | : 8 |
| Subsidiary risk | : 6.1 |
| Packing group | : II |
| Labels | : Corrosive, Toxic |
| Packing instruction (cargo aircraft) | : 855 |
| Packing instruction (passenger aircraft) | : 851 |

IMDG-Code

- | | |
|----------------------|---|
| UN number | : UN 2922 |
| Proper shipping name | : CORROSIVE LIQUID, TOXIC, N.O.S.
(BIS(DIMETHYLAMINOETHYL)ETHER) |
| Class | : 8 |
| Subsidiary risk | : 6.1 |
| Packing group | : II |
| Labels | : 8 (6.1) |
| EmS Code | : F-A, S-B |
| Marine pollutant | : no |

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations**TDG**

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UN number	:	UN 2922
Proper shipping name	:	CORROSIVE LIQUID, TOXIC, N.O.S. (BIS(DIMETHYLAMINOETHYL)ETHER)
Class	:	8
Subsidiary risk	:	6.1
Packing group	:	II
Labels	:	8 (6.1)
ERG Code	:	154
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**The components of this product are reported in the following inventories:**

DSL	:	All components of this product are on the Canadian DSL
AIIC	:	On the inventory, or in compliance with the inventory
NZIoC	:	On the inventory, or in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory

Inventories

AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

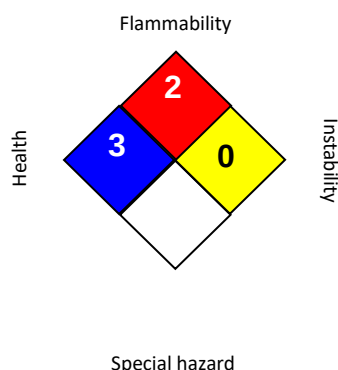
Canada. CEPA 1999 Significant New Activity (SNAc) List

No substances are subject to a Significant New Activity Notification.

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SECTION 16. OTHER INFORMATION**Further information****NFPA 704:****HMIS® IV:**

HEALTH		3
FLAMMABILITY		2
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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ACGIH : USA. ACGIH Threshold Limit Values (TLV)
 CA AB OEL : Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
 CA BC OEL : Canada. British Columbia OEL
 ACGIH / TWA : 8-hour, time-weighted average
 ACGIH / STEL : Short-term exposure limit
 CA AB OEL / TWA : 8-hour Occupational exposure limit
 CA AB OEL / STEL : 15-minute occupational exposure limit
 CA BC OEL / TWA : 8-hour time weighted average
 CA BC OEL / STEL : short-term exposure limit

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.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

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.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards,

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toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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