EPOCAST® 1619-1 A US

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SECTION 1. IDENTIFICATION

Product name : EPOCAST® 1619-1 A US

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC

Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)

Telephone : Non-Emergency: (800) 257-5547

E-mail address : Global_Product_EHS_AdMat@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Epoxy constituents

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

Short-term (acute) aquatic hazard : Category 2

Long-term (chronic) aquatic hazard : Category 2

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.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**

P261 Avoid breathing mist or vapours.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing must not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ 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.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P391 Collect spillage.
Storage:
Not available
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	30 - 50
Glass, oxide, chemicals	65997-17-3	10 - 20
1,4-bis(2,3-epoxypropoxy)butane	2425-79-8	10 - 20
acidic polyester, copolymer	Not Assigned	1 - 5
silicon dioxide	7631-86-9	0.1 - 1

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

Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin

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.
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 : If skin irritation persists, call a physician.
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 : Keep respiratory tract clear.
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 : None known.

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. 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 : Do not allow run-off from fire fighting to enter drains or water

firefighting		courses.
Hazardous combustion products	:	Carbon oxides Halogenated compounds
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local 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 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	:	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	:	Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product. Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. 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.
Keep in properly labelled containers.

Materials to avoid : For incompatible materials please refer to Section 10 of this SDS.

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
silicon dioxide	7631-86-9	TWA (Dust)	20 Million particles per cubic foot (Silica)	OSHA Z-3
		TWA (Dust)	80 mg/m3 / %SiO2 (Silica)	OSHA Z-3
		TWA (Respirable dust)	0.05 mg/m3 (Silica)	NIOSH REL
		TWA	6 mg/m3 (Silica)	NIOSH REL
		PEL (respirable)	0.05 mg/m3	OSHA CARC

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

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.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	paste
Colour	:	white
Odour	:	No data is available on the product itself.
Odour Threshold	:	No data is available on the product itself.
pH	:	No data is available on the product itself.
Melting point/freezing point	:	No data is available on the product itself.
Boiling point	:	No data is available on the product itself.
Flash point	:	> 212 °F / > 100 °C
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	:	No data is available on the product itself.
Relative vapour density	:	No data is available on the product itself.
Relative density	:	No data is available on the product itself.
Density	:	0.649 g/cm3
Solubility(ies)		

Water solubility	:	No data is available on the product itself.
Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	No data is available on the product itself.
Auto-ignition temperature	:	No data is available on the product itself.
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	:	No data is available on the product itself.
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 decomposition if stored and applied as directed.
Hazardous decomposition products	:	carbon dioxide carbon monoxide Halogenated compounds

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	:	Acute toxicity estimate: > 5,000 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Acute toxicity estimate: 15 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method

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

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Acute oral toxicity : LD50 (Rat, female): > 2,000 mg/kg
Method: OECD Test Guideline 420
Assessment: The substance or mixture has no acute oral toxicity
Remarks: No mortality observed at this dose.

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Glass, oxide, chemicals:

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

1,4-bis(2,3-epoxypropoxy)butane:

Acute oral toxicity : LD50 (Rat, male and female): 1,163 mg/kg
Method: OECD Test Guideline 401
GLP: yes
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : LC50 (Rat): > 2.068 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Test atmosphere: dust/mist
Method: Expert judgement
Assessment: The component/mixture is moderately toxic after short term inhalation., The substance/mixture is not toxic on inhalation as defined by dangerous goods regulations.

Acute dermal toxicity : Acute toxicity estimate: 1,100 mg/kg
Method: Converted acute toxicity point estimate

Assessment: The component/mixture is moderately toxic after single contact with skin.

silicon dioxide:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC50 (Rat, male and female): > 58.8 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg

Skin corrosion/irritation

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species	:	Rabbit
Exposure time	:	4 h
Assessment	:	Irritating to skin.
Method	:	OECD Test Guideline 404
Result	:	Irritating to skin.

Glass, oxide, chemicals:

Species	:	Rabbit
Assessment	:	No skin irritation
Method	:	OECD Test Guideline 404
Result	:	Normally reversible injuries

1,4-bis(2,3-epoxypropoxy)butane:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	Skin irritation
GLP	:	yes

acidic polyester, copolymer:

Assessment	:	Irritating to skin.

silicon dioxide:

Species	:	Rabbit
Assessment	:	No skin irritation
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

Serious eye damage/eye irritation

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species	:	Rabbit
Result	:	Irritating to eyes.
Assessment	:	Irritating to eyes.
Method	:	OECD Test Guideline 405

1,4-bis(2,3-epoxypropoxy)butane:

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

acidic polyester, copolymer:

Result	:	Eye irritation

silicon dioxide:

Species	:	Rabbit
Result	:	No eye irritation
Assessment	:	No eye irritation
Method	:	OECD Test Guideline 405

Respiratory or skin sensitisation

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	The product is a skin sensitiser, sub-category 1B.

Glass, oxide, chemicals:

Exposure routes	:	Skin
Species	:	Other
Result	:	Does not cause skin sensitisation.

1,4-bis(2,3-epoxypropoxy)butane:

Exposure routes	:	Skin
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	May cause sensitisation by skin contact.
GLP	:	yes
Assessment	:	Harmful if inhaled.

Germ cell mutagenicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Genotoxicity in vitro	:	Test Type: In vitro mammalian cell gene mutation test Test system: mouse lymphoma cells Metabolic activation: without metabolic activation Result: positive Test Type: reverse mutation assay Test system: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay) Result: negative
Genotoxicity in vivo	:	Test Type: in vivo assay Species: Mouse (male) Cell type: Germ Application Route: Oral Dose: 3333, 10000 mg/kg

Result: negative

Test Type: gene mutation test
Species: Rat (male)
Cell type: Somatic
Application Route: Oral
Dose: 50,250,500,1000 mg/kg bw/day
Method: OECD Test Guideline 488
Result: negative

1,4-bis(2,3-epoxypropoxy)butane:

Genotoxicity in vitro : Test Type: reverse mutation assay
Concentration: 10 - 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive
GLP: yes
Remarks: Not classified due to data which are conclusive although insufficient for classification.

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster lung cells
Concentration: 1 - 100 µg/L
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: positive
GLP: yes
Remarks: Not classified due to data which are conclusive although insufficient for classification.

Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: positive
GLP: no
Remarks: Not classified due to data which are conclusive although insufficient for classification.

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse (male)
Cell type: Somatic
Application Route: Oral
Exposure time: 4 d
Dose: 187.5 - 750 mg/kg
Method: OECD Test Guideline 474
Result: negative
GLP: yes

Test Type: unscheduled DNA synthesis assay
Species: Rat
Cell type: Liver cells
Application Route: Oral
Method: OECD Test Guideline 486
Result: negative

Germ cell mutagenicity - Assessment	:	Weight of evidence does not support classification as a germ cell mutagen., Animal testing did not show any mutagenic effects.

silicon dioxide:

Genotoxicity in vitro	:	Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 473 Result: negative Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 476 Result: negative Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
Genotoxicity in vivo	:	Application Route: Inhalation Dose: 50 mg/m3 Result: negative

Carcinogenicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species	:	Rat, male
Application Route	:	Oral
Exposure time	:	24 month(s)
Dose	:	0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment	:	7 days/week
NOAEL	:	15 mg/kg bw/day
Method	:	OECD Test Guideline 453
Result	:	negative
Target Organs	:	Digestive organs
Species	:	Mouse, male
Application Route	:	Dermal
Exposure time	:	24 month(s)
Dose	:	0, 0.1, 10, 100 mg/kg bw/day
Frequency of Treatment	:	3 days/week
NOEL	:	0.1 mg/kg body weight
Method	:	OECD Test Guideline 453
Result	:	negative
Target Organs	:	Digestive organs
Species	:	Rat, female
Application Route	:	Dermal
Exposure time	:	24 month(s)
Dose	:	0.1, 100, 1000 mg/kg bw/day
Frequency of Treatment	:	5 days/week
NOEL	:	100 mg/kg body weight
Method	:	OECD Test Guideline 453
Result	:	negative
Species	:	Rat, female

Application Route	:	Oral
Exposure time	:	24 month(s)
Dose	:	0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment	:	7 days/week
NOAEL	:	100 mg/kg bw/day
Method	:	OECD Test Guideline 453
Result	:	negative
Target Organs	:	Digestive organs

Species	:	Rat, females
Application Route	:	Oral
Exposure time	:	24 month(s)
Dose	:	0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment	:	7 days/week
NOEL	:	2 mg/kg bw/day
Method	:	OECD Test Guideline 453
Result	:	negative
Target Organs	:	Digestive organs

silicon dioxide:

Species	:	Rat, male and female
Application Route	:	Oral
Exposure time	:	103 weeks
Dose	:	1800 - 3200 mg/kg
Frequency of Treatment	:	7 daily
Method	:	OECD Test Guideline 453
Result	:	negative

IARC	Group 1: Carcinogenic to humans silicon dioxide (Silica dust, crystalline)	 7631-86-9
	Group 2A: Probably carcinogenic to humans Glass, oxide, chemicals (glass)	 65997-17-3
	Group 2B: Possibly carcinogenic to humans Glass, oxide, chemicals (special-purpose fibres)	 65997-17-3
OSHA	OSHA specifically regulated carcinogen silicon dioxide (crystalline silica)	 7631-86-9
NTP	Known to be human carcinogen silicon dioxide (Silica, Crystalline (Respirable Size))	 7631-86-9

Reproductive toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Effects on fertility	:	Test Type: Two-generation study Species: Rat, male and female Application Route: Oral

Dose: 0, 50, 180, 540 or 750 milligram per kilogram
Duration of Single Treatment: 238 d
Frequency of Treatment: 1 daily
General Toxicity - Parent: NOEL: 540 mg/kg body weight
General Toxicity F1: NOEL: 750 mg/kg body weight
Symptoms: No adverse effects
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

Effects on foetal development : Species: Rabbit, female
Application Route: Dermal
Dose: 0, 30, 100 or 300 milligram per kilogram
Duration of Single Treatment: 28 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: NOAEL: 30 mg/kg body weight
Developmental Toxicity: NOAEL: 300 mg/kg body weight
Method: Other guidelines
Result: No teratogenic effects

Test Type: Pre-natal
Species: Rabbit, female
Application Route: Oral
Dose: 0, 20, 60 or 180 milligram per kilogram
Duration of Single Treatment: 13 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: NOAEL: 60 mg/kg body weight
Developmental Toxicity: NOAEL: 180 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Dose: 0, 60, 180 and 540 milligram per kilogram
Duration of Single Treatment: 10 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: NOAEL: 180 mg/kg body weight
Developmental Toxicity: NOAEL: > 540 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

1,4-bis(2,3-epoxypropoxy)butane:

Effects on foetal development : Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Dose: 0/30/100/300 mg/kg bw/day
Duration of Single Treatment: 17 d
General Toxicity Maternal: NOAEL: 300 mg/kg body weight
Developmental Toxicity: NOAEL: 300 mg/kg body weight
Method: OECD Test Guideline 414
GLP: yes
Remarks: Information given is based on data obtained from similar substances.

silicon dioxide:

Effects on foetal development	:	Species: Mouse Application Route: Oral General Toxicity Maternal: NOAEL: 1,340 mg/kg body weight Method: OECD Test Guideline 414 Result: No teratogenic effects Species: Rabbit Application Route: Oral General Toxicity Maternal: NOAEL: 1,600 mg/kg body weight Method: OECD Test Guideline 414 Result: No teratogenic effects Species: Rat Application Route: Oral General Toxicity Maternal: NOAEL: 1,350 mg/kg body weight Method: OECD Test Guideline 414 Result: No teratogenic effects

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species	:	Rat, male and female
NOAEL	:	50 mg/kg
Application Route	:	oral (gavage)
Exposure time	:	14 Weeks
Number of exposures	:	7 d
Dose	:	0, 50, 250, 1000 mg/kg/day
Method	:	OECD Test Guideline 408

Species	:	Rat, male and female
NOAEL	:	>= 10 mg/kg
Application Route	:	Skin contact
Exposure time	:	13 Weeks
Number of exposures	:	5 d
Dose	:	0, 10, 100, 1000 mg/kg/day
Method	:	OECD Test Guideline 411

Species	:	Mouse, male
NOAEL	:	100 mg/kg
Application Route	:	Skin contact
Exposure time	:	13 Weeks
Number of exposures	:	3 d
Dose	:	0, 1, 10, 100 mg/kg/day
Method	:	OECD Test Guideline 411

Glass, oxide, chemicals:

Species	:	Rat, male

LOEC	:	2.4 mg/m3
Test atmosphere	:	dust/mist
Exposure time	:	2,160 h
Number of exposures	:	6 h
Method	:	Directive 67/548/EEC, Annex, B.29

1,4-bis(2,3-epoxypropoxy)butane:

Species	:	Rat, male and female
NOAEL	:	200 mg/kg
Application Route	:	Oral
Exposure time	:	28 d
Number of exposures	:	daily
Dose	:	25, 100, 200, 400 mg/kg
Method	:	Subacute toxicity

Species	:	Rat, male and female
NOAEL	:	263 mg/kg
Application Route	:	Oral
Exposure time	:	90 h
Number of exposures	:	daily
Dose	:	0,30,100,300 mg/kg bw/day
Method	:	OECD Test Guideline 408
GLP	:	yes
Remarks	:	Information given is based on data obtained from similar substances.

Repeated dose toxicity - Assessment	:	Harmful if inhaled.

silicon dioxide:

Species	:	Rat, male and female
NOEC	:	4000 - 4500 mg/m3
Application Route	:	Ingestion
Test atmosphere	:	dust/mist
Exposure time	:	13 Weeks
Number of exposures	:	7 d
Method	:	OECD Test Guideline 413

Aspiration toxicity

No data available

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 2 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 1.8 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EC50: 11 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: EPA-660/3-75-009 NOEC: 4.2 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: EPA-660/3-75-009
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.3 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211
Toxicity to microorganisms	:	IC50 (activated sludge): > 100 mg/l Exposure time: 3 h Test Type: static test Test substance: Fresh water

Ecotoxicology Assessment

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

Glass, oxide, chemicals:

Toxicity to fish	:	LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l Exposure time: 96 h Test Type: Other guidelines Test substance: Fresh water Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 72 h Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EgC50 (Selenastrum capricornutum (green algae)): > 1,000 mg/l
Exposure time: 72 h
Test Type: semi-static test
Method: OECD Test Guideline 201

1,4-bis(2,3-epoxypropoxy)butane:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): 24 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 203
GLP: no

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 75 mg/l
End point: Immobilization
Exposure time: 24 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 202
GLP: no

Toxicity to algae/aquatic plants : EL50 (Pseudokirchneriella subcapitata (green algae)): > 160 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

NOELR (Pseudokirchneriella subcapitata (green algae)): 40 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 209
GLP: no

silicon dioxide:

Toxicity to fish : LL50 (Brachydanio rerio (zebrafish)): > 10,000 mg/l
Exposure time: 96 h

Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): >= 1,000 mg/l
Exposure time: 24 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EL50 (Desmodesmus subspicatus (green algae)): > 10,000 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Persistence and degradability

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Concentration: 20 mg/l
Result: Not readily biodegradable.
Biodegradation: 5 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Stability in water : Degradation half life (DT50): 4.83 d (25 °C) pH: 4
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 7.1 d (25 °C) pH: 9
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 3.58 d (25 °C) pH: 7
Method: OECD Test Guideline 111
Remarks: Fresh water

1,4-bis(2,3-epoxypropoxy)butane:

Biodegradability : aerobic
Inoculum: activated sludge
Concentration: 20 mg/l
Result: Not readily biodegradable.
Biodegradation: 43 %
Exposure time: 28 d
Method: OECD Test Guideline 301F
GLP: yes

aerobic
Inoculum: Sewage (STP effluent)
Concentration: 20 mg/l
Dissolved organic carbon (DOC)

Result: Not readily biodegradable.
Biodegradation: 38 %
Exposure time: 28 d
Method: OECD Test Guideline 301E
GLP: no

Bioaccumulative potential

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Bioaccumulation : Bioconcentration factor (BCF): 31
Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 3.242 (77 °F / 25 °C)
pH: 7.1
Method: OECD Test Guideline 117

1,4-bis(2,3-epoxypropoxy)butane:

Partition coefficient: n-octanol/water : log Pow: -0.269 (77 °F / 25 °C)
pH: 6.7
Method: OECD Test Guideline 117
GLP: yes

Mobility in soil

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Distribution among environmental compartments : Koc: 445

1,4-bis(2,3-epoxypropoxy)butane:

Distribution among environmental compartments : Koc: 12.59
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.
Toxic to aquatic life with long lasting effects.

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

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964
Environmentally hazardous	:	yes

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes

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

Not applicable for product as supplied.

National Regulations

49 CFR

UN/ID/NA number	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN)
Class	:	9
Packing group	:	III
Labels	:	CLASS 9
ERG Code	:	171
Marine pollutant	:	yes
Remarks	:	Shipment by ground under DOT is non-regulated; however it

may be shipped per the applicable hazard classification to facilitate multi-modal transport involving ICAO (IATA) or IMO.

Special precautions for user

Remarks : Shipment by ground under DOT is non-regulated; however it may be shipped per the applicable hazard classification to facilitate multi-modal transport involving ICAO (IATA) or IMO. 49CFR: no dangerous good in non-bulk packaging

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

Listed substances in the product are at low enough levels to not be expected to exceed the RQ

SARA 311/312 Hazards : Respiratory or skin sensitisation
Skin corrosion or irritation
Serious eye damage or eye irritation

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.

This product does not contain any hazardous air pollutants (HAP) >=0.1%, as defined by the U.S. Clean Air Act Section 112 (40 CFR 61

California Prop. 65

WARNING: This product can expose you to chemicals including 1,4-dioxane, formaldehyde, which is/are known to the State of California to cause cancer, and 4,4'-isopropylidenediphenol, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

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

ENCS : Not in compliance with the inventory

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

PICCS : Not 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)

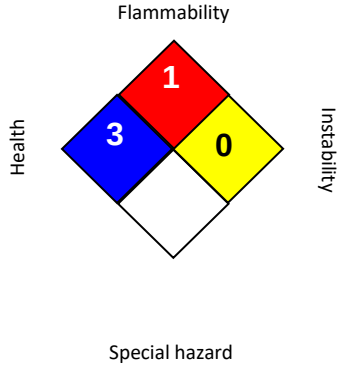
TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

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.

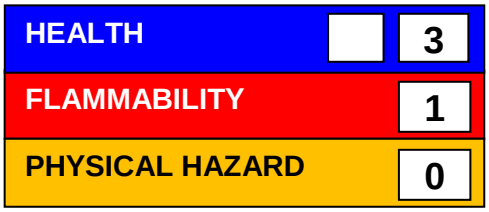
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



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

Revision Date	:	08/30/2023
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA CARC	:	OSHA Specifically Regulated Chemicals/Carcinogens
OSHA Z-3	:	USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA CARC / PEL	:	Permissible exposure limit (PEL)
OSHA Z-3 / TWA	:	8-hour time weighted average

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

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE.

EPOCAST® 1619-1 B US

Version	Revision Date:	SDS Number:	Date of last issue: 08/23/2023
1.3	08/30/2023	400000013351	Date of first issue: 10/19/2022

Print Date 08/13/2024

SECTION 1. IDENTIFICATION

Product name : EPOCAST® 1619-1 B US

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC

Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)

Telephone : Non-Emergency: (800) 257-5547

E-mail address : Global_Product_EHS_AdMat@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Hardener

SECTION 2. HAZARDS IDENTIFICATION

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

Acute toxicity (Inhalation) : Category 3

Skin corrosion : Category 1B

Serious eye damage : Category 1

Skin sensitisation : Category 1

Reproductive toxicity : Category 2

Specific target organ toxicity - single exposure : Category 3 (Respiratory system)

Short-term (acute) aquatic hazard : Category 3

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.

H331 Toxic if inhaled.
H335 May cause respiratory irritation.
H361 Suspected of damaging fertility or the unborn child.
H402 Harmful to aquatic life.

Precautionary statements : **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing mist or vapours.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing must not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
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.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
Storage:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Polyamines

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)

benzyl alcohol	100-51-6	20 - 30
Diethylenetriamine	111-40-0	20 - 30
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, reaction products with 3-aminomethyl-3,5,5-trimethylcyclohexylamine	68609-08-5	10 - 20
3-aminomethyl-3,5,5-trimethylcyclohexylamine	2855-13-2	10 - 20
9-Octadecenoic acid (9Z)-, polymer with N-(2-aminoethyl)-N'-[2-[(2-aminoethyl)amino]ethyl]-1,2-ethanediamine	70321-87-8	10 - 20
butane-1,4-diol	110-63-4	1 - 5
maleic acid	110-16-7	1 - 5
2-piperazin-1-ylethylamine	140-31-8	0.1 - 1

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 : Call a physician or poison control centre immediately.
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	:	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	:	None known.
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. 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	:	Carbon oxides Nitrogen oxides (NOx) Carbon dioxide (CO2) Carbon monoxide
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local 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 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. Ensure adequate ventilation. Evacuate personnel to safe areas. 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	:	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	:	Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product. Avoid formation of aerosol. Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. 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. 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 labelled containers.
Materials to avoid	:	For incompatible materials please refer to Section 10 of this SDS.
Recommended storage temperature	:	64 - 104 °F / 18 - 40 °C

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
Diethylenetriamine	111-40-0	TWA	1 ppm	ACGIH
		TWA	1 ppm 4 mg/m3	NIOSH REL
		TWA	1 ppm 4 mg/m3	OSHA P0

Personal protective equipment

Respiratory protection : In the case of vapour formation use a respirator with an approved filter.

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

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 : 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	:	yellow
Odour	:	No data is available on the product itself.
Odour Threshold	:	No data is available on the product itself.
pH	:	No data is available on the product itself.
Melting point/freezing point	:	No data is available on the product itself.
Boiling point	:	No data is available on the product itself.
Flash point	:	> 212 °F / > 100 °C
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	:	No data is available on the product itself.
Relative vapour density	:	No data is available on the product itself.
Relative density	:	No data is available on the product itself.
Density	:	0.986 g/cm3
Solubility(ies)		
Water solubility	:	No data is available on the product itself.
Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	No data is available on the product itself.
Auto-ignition temperature	:	No data is available on the product itself.
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	:	No data is available on the product itself.
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 decomposition if stored and applied as directed.
Hazardous decomposition products	:	carbon monoxide carbon dioxide Nitrogen oxides (NOx)

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	:	Acute toxicity estimate: 2,017 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Acute toxicity estimate: 0.8393 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method
Acute dermal toxicity	:	Acute toxicity estimate: 4,862 mg/kg Method: Calculation method

Components:

benzyl alcohol:

Acute oral toxicity	:	LD50 (Rat, male): 1,620 mg/kg Method: OECD Test Guideline 401
Acute inhalation toxicity	:	LC50 (Rat, male and female): 4.178 mg/l

Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Diethylenetriamine:

Acute oral toxicity : LD50 (Rat, male): 1,553 mg/kg
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : Acute toxicity estimate: 0.185 mg/l
Test atmosphere: dust/mist
Method: Expert judgement
Assessment: The component/mixture is highly toxic after short term inhalation.

LC0 (Rat, male and female): 0.07 mg/l
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
GLP: yes
Assessment: The component/mixture is highly toxic after short term inhalation.

LC100 (Rat, male and female): 0.3 mg/l
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
GLP: yes
Assessment: The component/mixture is highly toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rabbit): 1,045 mg/kg
GLP: no

4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, reaction products with 3-aminomethyl-3,5,5-trimethylcyclohexylamine**:**

Acute inhalation toxicity : Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: Not classified

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Acute oral toxicity : LD50 (Rat, male): 1,030 mg/kg
Method: OECD Test Guideline 401
GLP: no
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute toxicity estimate: 1,030 mg/kg
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : (Rat, male and female): > 5.01 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Symptoms: Breathing difficulties

GLP: yes

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

butane-1,4-diol:

Acute oral toxicity : LD50 (Rat, male and female): 1,500 mg/kg
Method: OECD Test Guideline 401
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : LC50 (Rat, male): > 15 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Acute Inhalation Toxicity: Fixed Concentration Procedure
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

maleic acid:

Acute oral toxicity : LD50 (Rat, male and female): 708 mg/kg
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute dermal toxicity : LD50 (Rabbit): 1,560 mg/kg
Assessment: The component/mixture is moderately toxic after single contact with skin.

2-piperazin-1-ylethylamine:

Acute oral toxicity : LD50 (Rabbit, male): 2,097 mg/kg
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute dermal toxicity : LD50 (Rabbit, male): 866 mg/kg
Assessment: The component/mixture is toxic after single contact with skin.

Skin corrosion/irritation

Components:

benzyl alcohol:

Species : Rabbit
Assessment : No skin irritation
Method : OECD Test Guideline 404
Result : No skin irritation

Diethylenetriamine:

Species	:	Rabbit
Assessment	:	Causes burns.
Result	:	Causes burns.
GLP	:	no

4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, reaction products with 3-aminomethyl-3,5,5-trimethylcyclohexylamine**:**

Species	:	reconstructed human epidermis (RhE)
Assessment	:	Causes burns.
Method	:	OECD Test Guideline 431
Result	:	Corrosive after 3 minutes to 1 hour of exposure
GLP	:	yes

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Species	:	Rabbit
Assessment	:	Causes burns.
Result	:	Causes burns.

9-Octadecenoic acid (9Z)-, polymer with N-(2-aminoethyl)-N'-[2-[(2-aminoethyl)amino]ethyl]-1,2-ethanediamine:

Assessment	:	Irritating to skin.

butane-1,4-diol:

Species	:	Rabbit
Assessment	:	No skin irritation
Result	:	No skin irritation

maleic acid:

Species	:	Human
Assessment	:	Irritating to skin.
Result	:	Irritating to skin.

2-piperazin-1-ylethylamine:

Species	:	Rabbit
Assessment	:	Causes burns.
Result	:	Causes burns.

Serious eye damage/eye irritation

Components:

benzyl alcohol:

Species	:	Rabbit
Result	:	Irritating to eyes.
Assessment	:	Irritant
Method	:	OECD Test Guideline 405

Diethylenetriamine:

Species	:	Rabbit
Result	:	Corrosive
Assessment	:	Corrosive
GLP	:	no

4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, reaction products with 3-aminomethyl-3,5,5-trimethylcyclohexylamine**:**

Result	:	Risk of serious damage to eyes.

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Species	:	Rabbit
Result	:	Irreversible effects on the eye
Assessment	:	Corrosive
Method	:	OECD Test Guideline 405
GLP	:	no

9-Octadecenoic acid (9Z)-, polymer with N-(2-aminoethyl)-N'-[2-[(2-aminoethyl)amino]ethyl]-1,2-ethanediamine:

Assessment	:	Corrosive

butane-1,4-diol:

Species	:	Rabbit
Result	:	No eye irritation
Assessment	:	No eye irritation

maleic acid:

Species	:	Rabbit
Assessment	:	Irritating to eyes.
Method	:	OECD Test Guideline 405

2-piperazin-1-ylethylamine:

Species	:	Rabbit
Result	:	Risk of serious damage to eyes.
Assessment	:	Risk of serious damage to eyes.

Respiratory or skin sensitisation

Components:

benzyl alcohol:

Exposure routes	:	Skin
Species	:	Guinea pig
Result	:	Does not cause skin sensitisation.

Diethylenetriamine:

Exposure routes	:	Skin
Species	:	Mouse
Assessment	:	Probability or evidence of low to moderate skin sensitisation rate in humans
Method	:	OECD Test Guideline 429
Result	:	Probability or evidence of low to moderate skin sensitisation

rate in humans

GLP : yes
Remarks : Causes sensitisation.

Exposure routes : Respiratory Tract
Species : Mouse
Result : Does not cause respiratory sensitisation.

4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, reaction products with 3-aminomethyl-3,5,5-trimethylcyclohexylamine**:**

Result : May cause sensitisation by skin contact.

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Test Type : Maximisation Test
Exposure routes : Skin
Species : Guinea pig
Assessment : Probability or evidence of high skin sensitisation rate in humans
Method : OECD Test Guideline 406
Result : Probability or evidence of high skin sensitisation rate in humans

9-Octadecenoic acid (9Z)-, polymer with N-(2-aminoethyl)-N'-[2-[(2-aminoethyl)amino]ethyl]-1,2-ethanediamine:

Assessment : May cause sensitisation by skin contact.

butane-1,4-diol:

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.

maleic acid:

Test Type : Local lymph node assay (LLNA)
Species : Mouse
Assessment : May cause sensitisation by skin contact.
Method : OECD Test Guideline 429
Result : May cause sensitisation by skin contact.
GLP : yes

2-piperazin-1-ylethylamine:

Test Type : Maximisation Test
Exposure routes : Skin
Species : Guinea pig
Method : OECD Test Guideline 406
Result : Probability or evidence of low to moderate skin sensitisation rate in humans

Germ cell mutagenicity

Components:

benzyl alcohol:

Genotoxicity in vivo : Application Route: Intraperitoneal injection
Dose: 200 mg/kg
Method: OECD Test Guideline 474
Result: negative

Diethylenetriamine:

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

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: without metabolic activation
Result: negative
GLP: yes

Test Type: gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: gene mutation test
Test system: rat hepatocytes
Metabolic activation: with and without metabolic activation
Result: negative

Genotoxicity in vivo : Test Type: Transgenic rodent somatic cell gene mutation assay
Species: Mouse (male)
Cell type: Bone marrow
Application Route: Oral
Exposure time: 5 and 28 days
Dose: 10 mL/kg
Method: OECD Test Guideline 488
Result: negative
GLP: yes

Test Type: gene mutation test
Species: Drosophila melanogaster (vinegar fly) (male)
Exposure time: 22 and 24 hours
Result: negative
GLP: yes

Test Type: Micronucleus test
Species: Mouse (male and female)
Cell type: Bone marrow
Application Route: Oral
Dose: 85, 283 and 850 mg/kg bw

Method: OECD Test Guideline 474
Result: negative
GLP: yes

4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, reaction products with 3-aminomethyl-3,5,5-trimethylcyclohexylamine**:**

Genotoxicity in vitro : Test Type: reverse mutation assay
Test system: Salmonella tryphimurium and E. coli
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
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

Test Type: Chromosome aberration test in vitro
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
GLP: yes

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

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
GLP: yes

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
GLP: yes

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

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse (male and female)
Cell type: Bone marrow
Application Route: Oral
Dose: 50, 150, or 500 mg/kg
Method: OECD Test Guideline 474
Result: negative

GLP: yes

butane-1,4-diol:

Genotoxicity in vitro : Test Type: gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Test Type: reverse mutation assay
Test system: Salmonella tryphimurium and E. coli
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

maleic acid:

Genotoxicity in vitro : 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: gene mutation test
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: yes

2-piperazin-1-ylethylamine:

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

Test Type: gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: sister chromatid exchange assay
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: unscheduled DNA synthesis assay

Test system: rat hepatocytes
Metabolic activation: negative
Result: negative

Test Type: gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 490
Result: negative
GLP: yes

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse (male and female)
Application Route: Intraperitoneal injection
Dose: 175 - 560 mg/kg
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

Components:

benzyl alcohol:

Species	:	Rat, male and female
Application Route	:	Oral
Exposure time	:	103 weeks
Dose	:	400 mg/kg
Frequency of Treatment	:	5 daily
Method	:	OECD Test Guideline 453
Result	:	negative

Diethylenetriamine:

Species	:	Mouse, male
Application Route	:	Dermal
Dose	:	56.3 mg/kg
Frequency of Treatment	:	3 days/week
NOEL	:	56.3 mg/kg bw/day
Result	:	negative
GLP	:	yes

butane-1,4-diol:

Species	:	Rat, female
Application Route	:	Oral
Exposure time	:	103 weeks
Dose	:	112/225/450 mg/kg
Frequency of Treatment	:	5 daily
NOAEL	:	225 mg/kg bw/day
LOAEL	:	450 mg/kg body weight
Result	:	negative
Remarks	:	Information given is based on data obtained from similar substances.

Species	:	Mouse, male and female
Application Route	:	Oral
Exposure time	:	103 weeks

Dose	:	262/525 mg/kg
Frequency of Treatment	:	5 daily
NOAEL	:	525 mg/kg bw/day
LOAEL	:	262 mg/kg body weight
Result	:	negative

maleic acid:

Species	:	Rat, male and female
Application Route	:	Oral
Exposure time	:	2 years
Dose	:	0, 10, 32, 100 mg/kg/day
Frequency of Treatment	:	7 days/week
NOAEL	:	>= 100 mg/kg bw/day
Method	:	OECD Test Guideline 451
Result	:	negative

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 on OSHA's list of regulated carcinogens.

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:

benzyl alcohol:

Effects on foetal development	:	Species: Mouse, female Application Route: Oral General Toxicity Maternal: LOAEL: 550 mg/kg body weight Result: No teratogenic effects

Diethylenetriamine:

Effects on fertility	:	Test Type: Reproduction / Developmental Toxicity Screening Test Species: Rat, male and female Application Route: Oral Dose: 30/100/300 mg/kg bw/day Frequency of Treatment: 7 days/week General Toxicity - Parent: NOAEL: 100 mg/kg wet weight General Toxicity F1: NOAEL: 30 mg/kg body weight Method: OECD Test Guideline 421 GLP: yes
Effects on foetal development	:	Test Type: reproductive and developmental toxicity study Species: Rat, male and female Application Route: Oral General Toxicity Maternal: NOAEL: 100 mg/kg body weight Developmental Toxicity: NOAEL: 30 mg/kg body weight Method: OECD Test Guideline 421 Result: No adverse effects GLP: yes

Test Type: Pre-natal
Species: Rat, females
Application Route: Oral
Dose: 0/25/100/250 milligram per kilogram
Duration of Single Treatment: 14 d
General Toxicity Maternal: NOAEL: 100 mg/kg body weight
Developmental Toxicity: NOEL: 100 mg/kg body weight
Method: OECD Test Guideline 414
GLP: yes

4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, reaction products with 3-aminomethyl-3,5,5-trimethylcyclohexylamine**:**

Effects on foetal development : Test Type: Pre-natal
Species: Rat, male and female
Application Route: Oral
Dose: 0/25/100/250 mg/kg bw/day
General Toxicity Maternal: NOAEL: 100 mg/kg body weight
Developmental Toxicity: NOEL: >= 250 mg/kg body weight
Method: OECD Test Guideline 414
GLP: yes

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
Dose: 0/25/80/240 mg/kg bw/day
Frequency of Treatment: 7 days/week
General Toxicity - Parent: NOAEL: 80 mg/kg body weight
General Toxicity F1: NOAEL: > 160 mg/kg body weight
Method: OECD Test Guideline 443
GLP: yes

Effects on foetal development : Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Dose: 10/50/250 milligram per kilogram
Duration of Single Treatment: 14 d
General Toxicity Maternal: NOEL: 50 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects
GLP: yes

Test Type: Pre-natal
Species: Rabbit, female
Application Route: Oral
Dose: 0/10/25/75 mg/kg bw/d
Duration of Single Treatment: 23 d
General Toxicity Maternal: NOAEL: 25 mg/kg body weight
Teratogenicity: NOAEL: > 250 mg/kg body weight
Developmental Toxicity: NOAEL: > 75 mg/kg body weight
Method: OECD Test Guideline 414
GLP: yes

butane-1,4-diol:

Effects on fertility : Test Type: Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
GLP: yes

Test Type: Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Result: negative

Effects on foetal development : Test Type: Pre-natal
Species: Mouse, females
Application Route: Oral
Dose: 100/300/600 mg/kg bw/d
Duration of Single Treatment: 10 d
General Toxicity Maternal: NOAEL: 100 mg/kg body weight
Developmental Toxicity: NOAEL: 100 mg/kg body weight
Method: OECD Test Guideline 414

Test Type: Pre-natal
Species: Rabbit, females
Application Route: inhalation (dust/mist/fume)
Dose: 0/0.5/1.4/5 mg/m3
Duration of Single Treatment: 14 d
General Toxicity Maternal: NOAEC: 5 mg/m³
Developmental Toxicity: NOAEC: 5 mg/m³
Method: OECD Test Guideline 414
Remarks: Information given is based on data obtained from similar substances.

maleic acid:

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Application Route: Oral
Dose: 0, 20, 55 and 150 mg/kg
Frequency of Treatment: 7 days/week
General Toxicity - Parent: LOEL: 20 mg/kg body weight
General Toxicity F1: NOEL: 150 mg/kg body weight
General Toxicity F2: NOEL: 55 mg/kg body weight
Target Organs: Kidney
Method: OECD Test Guideline 416

2-piperazin-1-ylethylamine:

Effects on fertility : Test Type: Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test
Species: Rat, male and female
Application Route: Oral
Dose: 500/2000/8000 ppm
Duration of Single Treatment: 28 d
General Toxicity - Parent: NOAEC: 8,000 ppm

General Toxicity F1: NOEL: 8,000 ppm
Method: OECD Test Guideline 422

Effects on foetal development : Test Type: reproductive and developmental toxicity study
Species: Rat, male and female
Application Route: Oral
General Toxicity Maternal: LOAEC: 8,000 ppm
Developmental Toxicity: NOEL: 8,000 ppm
Method: OECD Test Guideline 422

Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Duration of Single Treatment: 14 d
General Toxicity Maternal: NOAEL: 1,000 mg/kg body weight
Developmental Toxicity: NOEL: 1,000 mg/kg body weight
Method: OECD Test Guideline 414

Test Type: Pre-natal
Species: Rabbit, female
Application Route: Oral
Duration of Single Treatment: 23 d
General Toxicity Maternal: NOAEL: 75 mg/kg body weight
Developmental Toxicity: NOAEL: 75 mg/kg body weight
Method: OECD Test Guideline 414

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

STOT - single exposure

Components:

Diethylenetriamine:

Exposure routes : Inhalation
Target Organs : Respiratory Tract
Assessment : May cause respiratory irritation.

butane-1,4-diol:

Exposure routes : Inhalation
Target Organs : Central nervous system
Assessment : May cause drowsiness or dizziness.

maleic acid:

Exposure routes : Inhalation
Target Organs : Lungs
Assessment : The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

STOT - repeated exposure

Components:

2-piperazin-1-ylethylamine:

Exposure routes	:	Inhalation
Target Organs	:	Respiratory Tract
Assessment	:	Causes damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

benzyl alcohol:

Species	:	Rat, male and female
NOEC	:	400 mg/kg, 1072 mg/m3
Application Route	:	Inhalation
Test atmosphere	:	dust/mist
Exposure time	:	4 Weeks
Number of exposures	:	6 h
Method	:	OECD Test Guideline 412

Diethylenetriamine:

Species	:	Rat, male and female
NOAEL	:	70 - 80 mg/kg
LOAEL	:	530 - 620 mg/kg
Application Route	:	oral (feed)
Exposure time	:	90 days
Number of exposures	:	7 days/week
Dose	:	1000, 7500, or 15000 ppm
Method	:	OECD Test Guideline 451
GLP	:	yes

Species	:	Rat, male and female
NOEC	:	0.55 mg/l
Application Route	:	inhalation (vapour)
Exposure time	:	15 days 6 h
Number of exposures	:	7 days/week
Dose	:	0/130 ppm

Species	:	Rat, male and female
NOAEL	:	114 mg/kg
Application Route	:	Dermal
Number of exposures	:	6 days/week
Dose	:	0.4 mls of a 100 mg/cc solutio

4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, reaction products with 3-aminomethyl-3,5,5-trimethylcyclohexylamine**:**

Species	:	Rat, male and female
NOAEL	:	10 mg/kg
LOAEL	:	100 mg/kg
Application Route	:	oral (gavage)
Exposure time	:	90 d
Number of exposures	:	7 days/week
Dose	:	0/10/100/200 mg/kg bw/day

Method	:	OECD Test Guideline 408
GLP	:	yes

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Species	:	Rat, male and female
NOAEL	:	59 - 62 mg/kg
LOAEL	:	160 mg/kg
Application Route	:	oral (drinking water)
Exposure time	:	90 d
Number of exposures	:	daily
Dose	:	20, 60, 160 mg/kg
Method	:	OECD Test Guideline 408
Target Organs	:	Kidney

Species	:	Rat, male and female
NOEC	:	200 mg/m3
Application Route	:	Inhalation
Test atmosphere	:	dust/mist
Exposure time	:	216 h
Number of exposures	:	6h
Method	:	Subacute toxicity
Target Organs	:	respiratory tract irritation

butane-1,4-diol:

Species	:	Rat, male
NOAEL	:	225 - 450 mg/kg
Application Route	:	Oral
Exposure time	:	13 weeks
Number of exposures	:	5 days/week
Dose	:	0/56/112/225/450/900 mg/kg
Method	:	OECD Test Guideline 408

Species	:	Rat, male
NOEC	:	1 mg/l
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	2 weeks 6 h
Number of exposures	:	5 days/week
Dose	:	0.20, 1.0, or 5 mg/l
Method	:	OECD Test Guideline 412

maleic acid:

Species	:	Rat, male and female
NOEL	:	40 mg/kg
Application Route	:	oral (feed)
Exposure time	:	90 d
Number of exposures	:	7 days/week
Method	:	OECD Test Guideline 408

2-piperazin-1-ylethylamine:

Species	:	Rat, male and female
NOAEL	:	152 mg/kg/d
Application Route	:	oral (drinking water)
Exposure time	:	28 d

Method	:	OECD Test Guideline 422
Species	:	Rat, male and female
NOAEL	:	> 1000 mg/kg/d
Application Route	:	Dermal
Exposure time	:	29 d
Number of exposures	:	6h/d, 5d/w
Method	:	OECD Test Guideline 410
Species	:	Rat, male and female
NOEC	:	0.2 mg/m3
Application Route	:	Inhalation
Exposure time	:	90 d
Number of exposures	:	6h/d, 5d/w
Method	:	OECD Test Guideline 413
Target Organs	:	Respiratory Tract
Assessment	:	The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.
Species	:	Rat, male and female
NOEC	:	53.3 mg/m3
Application Route	:	Inhalation
Exposure time	:	90 d
Number of exposures	:	6h/d, 5d/w
Method	:	OECD Test Guideline 413

Aspiration toxicity

No data available

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

benzyl alcohol:

Toxicity to fish	:	LC50 : 460 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water Method: OPPTS 850.1075
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 230 mg/l Exposure time: 48 h Test substance: Fresh water

Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EgC50 (Selenastrum capricornutum (green algae)): 770 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 51 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

Diethylenetriamine:

Toxicity to fish : LC50 (Poecilia reticulata (guppy)): 430 mg/l
End point: mortality
Exposure time: 96 h
Test Type: semi-static test
Analytical monitoring: no
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.1.
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 64.6 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: Regulation (EC) No. 440/2008, Annex, C.2

EC50 (Daphnia magna (Water flea)): 16 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: DIN 38412

Toxicity to algae/aquatic plants : EbC50 (Selenastrum capricornutum (green algae)): 1,164 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

Toxicity to fish (Chronic toxicity) : NOEC (Gasterosteus aculeatus (threespine stickleback)): 10 mg/l
Exposure time: 28 d
Test Type: semi-static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 210
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : NOEC (Daphnia magna (Water flea)): 5.6 mg/l
Exposure time: 21 d

(Chronic toxicity)

Test Type: semi-static test
Analytical monitoring: no
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.20
GLP: yes

Toxicity to microorganisms : EC50 (Bacteria): 32.7 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
GLP: yes

NOEC (Bacteria): 6 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
GLP: yes

Toxicity to soil dwelling organisms : EC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg
Exposure time: 56 d
Method: OECD Test Guideline 222
GLP: yes

Ecotoxicology Assessment

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

4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, reaction products with 3-aminomethyl-3,5,5-trimethylcyclohexylamine**:**

Toxicity to fish : LL50 (Oncorhynchus mykiss (rainbow trout)): 70.7 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 203
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): 11.1 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/aquatic plants : EL50 (Pseudokirchneriella subcapitata (green algae)): 79.4 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
GLP: yes

NOEC: 3.1 mg/l

Toxicity to microorganisms : EC50 (activated sludge): >= 1,000 mg/l

Exposure time: 3 h
Test Type: static test
Method: OECD Test Guideline 209
GLP: yes

Ecotoxicology Assessment

Acute aquatic toxicity : Harmful to aquatic life.

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

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 110 mg/l
End point: mortality
Exposure time: 96 h
Test Type: semi-static test
Analytical monitoring: yes
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.1.
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 23 mg/l
End point: mortality
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 plants : EC50 (Desmodesmus subspicatus (green algae)): > 50 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.3.
GLP: yes

EC10 (Desmodesmus subspicatus (green algae)): 11.2 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.3.
GLP: yes

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 3 mg/l
Exposure time: 21 d
Test Type: semi-static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 202
Remarks: No-observed-effect level

Toxicity to microorganisms : EC10 (Pseudomonas putida): 1,120 mg/l
Exposure time: 18 h

Test Type: static test
Method: Measured

butane-1,4-diol:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): > 30,000 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 813 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): > 500 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: DIN 38412

EC10 (Desmodesmus subspicatus (green algae)): 76 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: DIN 38412
GLP: yes

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): > 85 mg/l
Exposure time: 21 d
Test substance: Fresh water
Method: OECD Test Guideline 211

Toxicity to microorganisms : IC50 (Tetrahymena pyriformis): 15,536 mg/l
Exposure time: 40 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209

maleic acid:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 75 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: EPA-660/3-75-009
GLP: yes
Remarks: Information given is based on data obtained from similar substances.

LC50 (Lepomis macrochirus (Bluegill sunfish)): 75 mg/l
End point: mortality

Exposure time: 96 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: EPA-660/3-75-009
GLP: yes
Remarks: Information given is based on data obtained from similar substances.

LC50 (Leuciscus idus (Golden orfe)): > 245 mg/l
End point: mortality
Exposure time: 48 h
Test substance: Fresh water
Method: DIN 38412

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 42.81 mg/l
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 plants : ErC50 (Selenastrum capricornutum (green algae)): 74.35 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

ErC10 (Selenastrum capricornutum (green algae)): 11.8 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EC50 (Daphnia magna (Water flea)): 77 mg/l
Exposure time: 21 d
Test substance: Fresh water
GLP: no

NOEC (Daphnia magna (Water flea)): 10 mg/l
Exposure time: 21 d
Test substance: Fresh water
GLP: no

Toxicity to microorganisms : EC10 (Pseudomonas putida): 44.6 mg/l
Exposure time: 18 h
Test Type: static test
Method: DIN 38 412 Part 8

2-piperazin-1-ylethylamine:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 2,190 mg/l End point: mortality Exposure time: 96 h Test Type: static test Test substance: Fresh water
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 58 mg/l End point: Immobilization Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202 Remarks: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Toxicity to algae/aquatic plants	:	EC50 (Selenastrum capricornutum (green algae)): > 1,000 mg/l Exposure time: 72 h Test substance: Fresh water Method: OECD Test Guideline 201
Toxicity to microorganisms	:	EC50 (Bacteria): > 100 mg/l mg/kg Exposure time: 28 d Method: OECD Test Guideline 216 EC50 (activated sludge): 511 mg/l Exposure time: 2 h Test Type: static test Test substance: Fresh water Method: ISO Method, other
Toxicity to soil dwelling organisms	:	LC50 (Eisenia fetida (earthworms)): 712 mg/kg Exposure time: 56 d Method: OECD Test Guideline 222 NOEC (Eisenia fetida (earthworms)): 500 mg/kg Exposure time: 56 d Method: OECD Test Guideline 222

Persistence and degradability

Components:

benzyl alcohol:

Biodegradability	:	Inoculum: Sewage (STP effluent) Concentration: 20 mg/l Result: Readily biodegradable. Biodegradation: 95 - 97 % Exposure time: 21 d Method: OECD Test Guideline 301A

Diethylenetriamine:

Biodegradability	:	aerobic Inoculum: activated sludge, non-adapted Result: Readily biodegradable.

Biodegradation: 87 %
Exposure time: 21 d
Method: OECD Test Guideline 301D
Test substance: Fresh water

Photodegradation : Test Type: Air
Rate constant: 500000
Degradation (direct photolysis): 50 %

4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, reaction products with 3-aminomethyl-3,5,5-trimethylcyclohexylamine**:**

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Concentration: 32.5 mg/l
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301F
GLP: yes

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Biodegradability : aerobic
Inoculum: activated sludge
Concentration: 6.9 mg/l
Dissolved organic carbon (DOC)
Result: Not readily biodegradable.
Biodegradation: 8 %
Exposure time: 28 d
Method: Directive 67/548/EEC Annex V, C.4.A.
Test substance: Fresh water
GLP: yes

butane-1,4-diol:

Biodegradability : aerobic
Inoculum: activated sludge
Theoretical oxygen demand
Result: Readily biodegradable.
Biodegradation: 93 - 96 %
Exposure time: 14 d
Method: OECD Test Guideline 301C
Test substance: Fresh water

aerobic
Inoculum: activated sludge
Dissolved organic carbon (DOC)
Result: Readily biodegradable.
Biodegradation: 90 - 100 %
Exposure time: 10 d
Method: OECD Test Guideline 302B
Test substance: Fresh water

Biochemical Oxygen Demand (BOD) : 102 mg/g
Incubation time: 5 d

Chemical Oxygen Demand (COD)	:	1,892 mg/g
Photodegradation	:	Test Type: Air Rate constant: < .00001

maleic acid:

Biodegradability	:	aerobic Inoculum: Sewage (STP effluent) Concentration: 13.78 mg/l Result: Readily biodegradable. Biodegradation: ca. 97 % Exposure time: 28 d Method: OECD Test Guideline 301B Test substance: Fresh water GLP: yes

2-piperazin-1-ylethylamine:

Biodegradability	:	aerobic Inoculum: activated sludge Result: Not readily biodegradable. Biodegradation: 0 % Exposure time: 28 d Method: OECD Test Guideline 301F
Biochemical Oxygen Demand (BOD)	:	5 mg/l Incubation time: 5 d
Chemical Oxygen Demand (COD)	:	560 mg/l
Photodegradation	:	Test Type: Air Degradation (direct photolysis): 50 %

Bioaccumulative potential

Components:

benzyl alcohol:

Bioaccumulation	:	Bioconcentration factor (BCF): 1
Partition coefficient: n-octanol/water	:	log Pow: 1.1 (68 °F / 20 °C)

Diethylenetriamine:

Bioaccumulation	:	Species: Cyprinus carpio (Carp) Bioconcentration factor (BCF): 0.3 - 6.3 Exposure time: 42 d Concentration: 0.2 - 2 mg/l Test substance: Fresh water Method: OECD Test Guideline 305C Remarks: Bioaccumulation is unlikely.
Partition coefficient: n-	:	log Pow: -1.58 (68 °F / 20 °C)

octanol/water

pH: > 12
Method: Calculation method
GLP: no

log Pow: -5.58 (68 °F / 20 °C)
pH: 7
Method: Calculation method
GLP: no

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Partition coefficient: n-octanol/water : log Pow: 0.99 (73 °F / 23 °C)
pH: 6.34
Method: OECD Test Guideline 107
GLP: yes

butane-1,4-diol:

Bioaccumulation : Bioconcentration factor (BCF): 3.16
Remarks: Bioaccumulation is unlikely.

Species: Fish
Bioconcentration factor (BCF): 3.16
Test substance: Fresh water

Partition coefficient: n-octanol/water : log Pow: -0.88 (77 °F / 25 °C)
Method: OECD Test Guideline 107

maleic acid:

Partition coefficient: n-octanol/water : log Pow: -1.3 (68 °F / 20 °C)
pH: 2.5
Method: OECD Test Guideline 107

2-piperazin-1-ylethylamine:

Bioaccumulation : Species: Fish
Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: -1.48 (68 °F / 20 °C)

Mobility in soil

Components:

benzyl alcohol:

Distribution among environmental compartments : Koc: 5 - 15

Diethylenetriamine:

Distribution among environmental compartments : Medium: Soil
Koc: 19111
Method: Sediment and Soil Adsorption Isotherm

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Distribution among environmental compartments : Koc: 928

butane-1,4-diol:

Distribution among environmental compartments : Koc: 0.41 - 1

2-piperazin-1-ylethylamine:

Distribution among environmental compartments : Koc: ca. 37000

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.

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

IATA-DGR

UN/ID No. : UN 2735
Proper shipping name : Polyamines, liquid, corrosive, n.o.s. (DIETHYLENETRIAMINE, cycloaliphatic polyamine)
Class : 8
Packing group : II

Labels	:	Corrosive
Packing instruction (cargo aircraft)	:	855
Packing instruction (passenger aircraft)	:	851

IMDG-Code

UN number	:	UN 2735
Proper shipping name	:	POLYAMINES, LIQUID, CORROSIVE, N.O.S. (DIETHYLENETRIAMINE, cycloaliphatic polyamine)
Class	:	8
Packing group	:	II
Labels	:	8
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

49 CFR

UN/ID/NA number	:	UN 2735
Proper shipping name	:	Polyamines, liquid, corrosive, n.o.s. (DIETHYLENETRIAMINE, cycloaliphatic polyamine)
Class	:	8
Packing group	:	II
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

Listed substances in the product are at low enough levels to not be expected to exceed the RQ

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

This product does not contain any hazardous air pollutants (HAP) >=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 State of California to cause cancer, birth defects, or any other reproductive harm.

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

DSL	:	This product contains one or several components listed in the Canadian NDSL.
AIIC	:	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	:	Not 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)

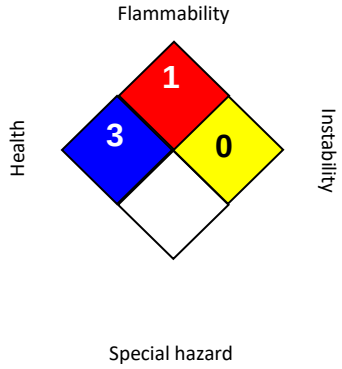
TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

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.

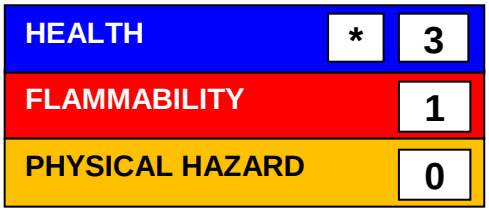
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



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

Revision Date	:	08/30/2023
ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA P0 / TWA	:	8-hour time weighted average

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.

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

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