EPOCAST® 1618 B US

Version	Revision Date:	SDS Number:	Date of last issue: 08/18/2017
2.0	01/25/2022	400001007909	Date of first issue: 04/01/2016

Print Date 03/17/2022

SECTION 1. IDENTIFICATION

Product name : EPOCAST® 1618 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 of person responsible for the SDS : 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 (Oral) : Category 4

Acute toxicity (Inhalation) : Category 2

Acute toxicity (Dermal) : Category 3

Skin corrosion : Category 1B

Serious eye damage : Category 1

Skin sensitisation : Category 1

Reproductive toxicity : Category 1B

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

Specific target organ toxicity - repeated exposure (Oral) : Category 2 (Liver, Kidney, Skeletal muscle, Heart)

Short-term (acute) aquatic hazard : Category 2

Chronic aquatic toxicity : Category 2

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements :
H302 Harmful if swallowed.
H311 Toxic in contact with skin.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H330 Fatal if inhaled.
H335 May cause respiratory irritation.
H360F May damage fertility.
H373 May cause damage to organs (Liver, Kidney, Skeletal muscle, Heart) through prolonged or repeated exposure if swallowed.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements :
Prevention:
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe mist or vapours.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
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.
P284 Wear respiratory protection.
Response:
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P391 Collect spillage.
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 facility in accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
Diethylenetriamine	111-40-0	30 - 50
4,4'-isopropylidenediphenol	80-05-7	30 - 50
2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine)	6864-37-5	10 - 20
2-aminoethanol	141-43-5	5 - 10

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.
Take victim immediately to hospital.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.

In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : 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 dioxide (CO2)
Carbon monoxide
Nitrogen oxides (NOx)
Carbon oxides

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 : 36 - 104 °F / 2 - 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
2-aminoethanol	141-43-5	TWA	3 ppm	ACGIH
		STEL	6 ppm	ACGIH
		TWA	3 ppm 6 mg/m3	OSHA Z-1
		TWA	3 ppm 8 mg/m3	NIOSH REL
		ST	6 ppm 15 mg/m3	NIOSH REL
		STEL	6 ppm 15 mg/m3	OSHA P0
		TWA	3 ppm 8 mg/m3	OSHA P0

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.

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

Hand protection
Material : butyl-rubber

Break through time	:	> 8 h
Material	:	Solvent-resistant gloves (butyl-rubber)
Material	:	Nitrile rubber
Break through time	:	10 - 480 min
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	:	amber
Odour	:	amine-like
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 available
Initial boiling point and boiling range	:	No data available
Flash point	:	> 212 °F / > 100 °C Method: Pensky-Martens closed cup
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
Flammability (liquids)	:	No data is available on the product itself.

Upper explosion limit / Upper flammability limit	:	No data 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	:	1
Density	:	1 g/cm3 (77 °F / 25 °C)
Solubility(ies)		
Water solubility	:	partly soluble (68 °F / 20 °C)
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	:	> 392 °F / > 200 °C
Self-Accelerating decomposition temperature (SADT)	:	No data is available on the product itself.
Viscosity		
Viscosity, dynamic	:	400 mPa.s (77 °F / 25 °C)
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Molecular weight	:	No data available
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: 1,409 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Acute toxicity estimate: 0.3705 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method Assessment: The substance/mixture is not toxic on inhalation as defined by dangerous goods regulations.
Acute dermal toxicity	:	Acute toxicity estimate: 898.66 mg/kg Method: Calculation method

Components:

Diethylenetriamine:

Acute oral toxicity	:	LD50 (Rat, male): 1,620 mg/kg
Acute inhalation toxicity	:	LC50 (Rat, male and female): 0.185 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403
Acute dermal toxicity	:	LD50 (Rabbit): 1,045 mg/kg

4,4'-isopropylidenediphenol:

Acute oral toxicity	:	LD50 (Rat, male and female): > 2,000 - < 5,000 mg/kg Method: OECD Test Guideline 401 Assessment: The substance or mixture has no acute oral toxicity
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 170 mg/m3 Exposure time: 6 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rabbit, male): ca. 6,400 mg/kg

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Acute oral toxicity	:	LD50 (Rat, male and female): 320 - 460 mg/kg Method: OECD Test Guideline 401 GLP: no

Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : LC50 (Rat, male and female): 0.42 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The component/mixture is highly toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rabbit, male and female): 200 - 400 mg/kg
Method: OECD Test Guideline 402
GLP: no
Assessment: The component/mixture is toxic after single contact with skin.

2-aminoethanol:

Acute oral toxicity : LD50 (Rat, male and female): 1,089 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC50 (Rat, male and female): 1.3 mg/l
Exposure time: 6 h
Test atmosphere: vapour
Assessment: The component/mixture is moderately toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rabbit, male and female): 2,504 mg/kg
Method: OECD Test Guideline 402
Assessment: The component/mixture is moderately toxic after single contact with skin.

Skin corrosion/irritation

Components:

Diethylenetriamine:

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

4,4'-isopropylidenediphenol:

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

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Species : Rabbit
Assessment : Causes burns.
Method : OECD Test Guideline 404
Result : Causes burns.
GLP : no

Species : synthetic macromolecular bio-barrier
Assessment : Causes burns.

Method	:	OECD Test Guideline 435
Result	:	Causes burns.
GLP	:	yes

2-aminoethanol:

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

Serious eye damage/eye irritation

Components:

Diethylenetriamine:

Species	:	Rabbit
Result	:	Corrosive
Assessment	:	Corrosive

4,4'-isopropylidenediphenol:

Species	:	Rabbit
Result	:	Irreversible effects on the eye
Method	:	OECD Test Guideline 405

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Species	:	Rabbit
Result	:	Irreversible effects on the eye
Exposure time	:	24 h
Assessment	:	Risk of serious damage to eyes.
Method	:	OECD Test Guideline 405
GLP	:	no

2-aminoethanol:

Species	:	Rabbit
Result	:	Corrosive
Assessment	:	Corrosive

Respiratory or skin sensitisation

Components:

Diethylenetriamine:

Exposure routes	:	Skin
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	May cause sensitisation by skin contact.
Remarks	:	Causes sensitisation.
Exposure routes	:	Respiratory Tract
Species	:	Mouse
Result	:	Does not cause respiratory sensitisation.

4,4'-isopropylidenediphenol:

Exposure routes	:	Skin

Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	Does not cause skin sensitisation.

Exposure routes	:	Skin
Species	:	Humans
Assessment	:	May cause sensitisation by skin contact.
Result	:	Causes sensitisation.

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Test Type	:	Maximisation Test
Exposure routes	:	Skin
Species	:	Guinea pig
Assessment	:	Did not cause sensitisation on laboratory animals.
Method	:	OECD Test Guideline 406
Result	:	Did not cause sensitisation on laboratory animals.
GLP	:	no

2-aminoethanol:

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

Germ cell mutagenicity

Components:

Diethylenetriamine:

Genotoxicity in vivo	:	Cell type: Somatic Application Route: Oral Dose: 85 - 850 mg/kg Method: OECD Test Guideline 474 Result: negative Application Route: Oral Result: negative

4,4'-isopropylidenediphenol:

Genotoxicity in vitro	:	Metabolic activation: with and without metabolic activation Result: negative
Genotoxicity in vivo	:	Method: OECD Test Guideline 474 Result: negative

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Genotoxicity in vitro	:	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: 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: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes

2-aminoethanol:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Metabolic activation: negative
Result: negative

Genotoxicity in vivo : Application Route: Oral
Exposure time: 24 h
Dose: 375 - 1500 mg/kg
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

Components:

Diethylenetriamine:

Species	:	Mouse, male
Application Route	:	Dermal
Dose	:	56.3 mg/kg
Frequency of Treatment	:	3 daily
Result	:	negative

4,4'-isopropylidenediphenol:

Species	:	Rat, male and female
Application Route	:	Oral
Exposure time	:	103 weeks
Frequency of Treatment	:	7 daily
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:

Diethylenetriamine:

Effects on fertility	:	Species: Rat, male and female Application Route: Oral General Toxicity - Parent: NOAEL: 30 mg/kg wet weight Method: OECD Test Guideline 421
Effects on foetal development	:	Species: Rat Application Route: Oral General Toxicity Maternal: NOAEL: 100 mg/kg body weight Method: OECD Test Guideline 421 Result: No adverse effects

4,4'-isopropylidenediphenol:

Effects on fertility	:	Species: Rat, male and female Application Route: Oral Method: OECD Test Guideline 416 Result: Embryotoxic effects and adverse effects on the offspring were detected.
Effects on foetal development	:	Species: Rat, female Application Route: Oral General Toxicity Maternal: NOAEL: < 160 mg/kg body weight Method: OECD Test Guideline 416 Result: No teratogenic effects
Reproductive toxicity - Assessment	:	Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Effects on fertility	:	Species: Rat, male and female Application Route: Oral Dose: 1.5/5/15 mg/kg bw/d General Toxicity - Parent: NOAEL: 1.5 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: 5, 15 and 45 mg/kg bw /day Duration of Single Treatment: 20 d Frequency of Treatment: 7 days/week General Toxicity Maternal: NOAEL: 5 mg/kg body weight Developmental Toxicity: NOAEL: 45 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: 1/3/9 mg/kg bw/d
Duration of Single Treatment: 23 d
Frequency of Treatment: 7 days/week
General Toxicity Maternal: NOAEL: 1 mg/kg body weight
Developmental Toxicity: NOAEL: 9 mg/kg body weight
Method: OECD Test Guideline 414
GLP: yes

2-aminoethanol:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
Target Organs: Reproductive organs
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

Effects on foetal development : Species: Rat
Application Route: Oral
General Toxicity Maternal: NOAEL: 120 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rat
Application Route: Dermal
General Toxicity Maternal: NOAEL: 75 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

STOT - single exposure

Components:

Diethylenetriamine:

Target Organs : Respiratory Tract
Assessment : May cause respiratory irritation.

4,4'-isopropylidenediphenol:

Assessment : The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

2-aminoethanol:

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

STOT - repeated exposure

Components:

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Exposure routes	:	Ingestion
Target Organs	:	Liver, Kidney, Skeletal muscle, Heart
Assessment	:	May cause damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

Diethylenetriamine:

Species	:	Rat, male and female
NOEC	:	70 - 80 mg/m3
Application Route	:	Ingestion
Test atmosphere	:	vapour
Exposure time	:	360 h
Number of exposures	:	7 d
Method	:	Subchronic toxicity

Species	:	Rat, male and female
NOAEL	:	114 mg/kg/d
Application Route	:	Skin contact
Exposure time	:	9,600 h
Number of exposures	:	6 d
Method	:	Chronic toxicity

4,4'-isopropylidenediphenol:

Species	:	Dog, male and female
NOEC	:	75 mg/kg, 10 mg/m3
Application Route	:	Ingestion
Test atmosphere	:	dust/mist
Exposure time	:	2,160 h
Number of exposures	:	7 d
Method	:	Subchronic toxicity

Species	:	Rat, male and female
LOAEL	:	600 mg/kg
Application Route	:	Ingestion
Exposure time	:	672 h
Number of exposures	:	7 d
Method	:	Subchronic toxicity

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Species	:	Rat, male and female
NOEC	:	12 mg/m3
Application Route	:	Inhalation
Test atmosphere	:	vapour
Exposure time	:	6 h
Number of exposures	:	5 days/week
Method	:	OECD Test Guideline 413
GLP	:	yes

Species	:	Rat, male and female
NOAEL	:	2.5 mg/kg
Application Route	:	oral (gavage)
Exposure time	:	3 months
Number of exposures	:	5 days/week
Dose	:	2.5, 12, 60 mg/kg bw/day
Method	:	OECD Test Guideline 408
GLP	:	yes
Target Organs	:	Liver, Kidney, Skeletal muscle, Heart

2-aminoethanol:

Species	:	Rat, male and female
NOEC	:	300 mg/m3
Application Route	:	Ingestion
Test atmosphere	:	vapour
Exposure time	:	672 h
Number of exposures	:	7 d
Method	:	OECD Test Guideline 412

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:

Diethylenetriamine:

Toxicity to fish	:	LC50: 430 mg/l Exposure time: 96 h Test Type: semi-static test Test substance: Fresh water Method: Directive 67/548/EEC, Annex V, C.1.
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
Test substance: Fresh water
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity) : NOEC: 10 mg/l
Exposure time: 28 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 210

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 5.6 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.20

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

Ecotoxicology Assessment

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

4,4'-isopropylidenediphenol:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 7.5 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50: 3.9 - 10.2 mg/l
Exposure time: 48 h

(Ceriodaphnia dubia (Water flea)):

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 2.5 - 3.1 mg/l
Exposure time: 96 h

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)): 0.016 mg/l
Exposure time: 444 d
Test Type: flow-through test
Test substance: Fresh water
Method: Fish Life Cycle Toxicity
Remarks: Toxic to aquatic organisms.

Ecotoxicology Assessment

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

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Toxicity to fish	:	LC50 (Oryzias latipes (Orange-red killifish)): 22.4 mg/l End point: mortality Exposure time: 96 h Test Type: semi-static test Analytical monitoring: yes Test substance: Fresh water Method: OECD Test Guideline 203 GLP: yes
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 4.57 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	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 7.9 mg/l Exposure time: 72 h Test Type: static test Analytical monitoring: yes Test substance: Fresh water Method: OECD Test Guideline 201 GLP: yes EC10 (Pseudokirchneriella subcapitata (green algae)): 4.1 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 fish (Chronic toxicity)	:	NOEC (Fish): > 1 mg/l Method: QSAR GLP: no Remarks: The value is given based on a SAR/AAR approach using OECD Toolbox, DEREK, VEGA QSAR models (CAESAR models), etc.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 4 mg/l Exposure time: 21 d Test Type: semi-static test Analytical monitoring: yes Test substance: Fresh water Method: OECD Test Guideline 211 GLP: yes
Toxicity to microorganisms	:	EC20 (activated sludge): 160 mg/l Exposure time: 30 min Test Type: static test Analytical monitoring: no Method: ISO 8192

GLP: no

Ecotoxicology Assessment

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

2-aminoethanol:

Toxicity to fish : LC50 (Cyprinus carpio (Carp)): 349 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 65 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.2.

Toxicity to algae/aquatic plants : ErC50: 2.8 mg/l
Exposure time: 72 h
Test substance: Fresh water
Method: OECD Test Guideline 201

NOECr: 1 mg/l
Exposure time: 72 h
Test substance: Fresh water
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity) : NOEC (Oryzias latipes (Orange-red killifish)): 1.2 mg/l
Exposure time: 30 d
Test substance: Fresh water
Method: OECD Test Guideline 210

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.85 mg/l
Exposure time: 21 d
Test substance: Fresh water
Method: OECD Test Guideline 211

Persistence and degradability

Components:

Diethylenetriamine:

Biodegradability : Inoculum: activated sludge
Result: Readily biodegradable.
Biodegradation: 87 %
Exposure time: 21 d
Method: OECD Test Guideline 301D

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

4,4'-isopropylidenediphenol:

Biodegradability : Result: Not readily biodegradable.

Biodegradation: 1 - 2 %
Exposure time: 28 d

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Biodegradability : aerobic
Inoculum: Sewage (STP effluent)
Concentration: 100 mg/l
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301C
Test substance: Fresh water
GLP: yes

2-aminoethanol:

Biodegradability : Inoculum: activated sludge
Concentration: 20 mg/l
Result: Readily biodegradable.
Biodegradation: > 90 %
Exposure time: 21 d
Method: OECD Test Guideline 301A

Photodegradation : Test Type: Air
Rate constant: 35.844
Degradation (direct photolysis): 50 %

Bioaccumulative potential

Components:

Diethylenetriamine:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 0.3 - 6.3
Exposure time: 42 d
Test substance: Fresh water
Method: flow-through test
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: -1.58 (68 °F / 20 °C)
pH: 7

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): < 60
Exposure time: 60 d
Temperature: 75 °F / 24 °C
Concentration: 0.02 mg/l
Test substance: Fresh water
Method: OECD Test Guideline 305C
GLP: yes
Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 2.3 (73 °F / 23 °C)
pH: 10

Method: OECD Test Guideline 107

2-aminoethanol:

Partition coefficient: n-octanol/water : log Pow: -1.31 (77 °F / 25 °C)

Mobility in soil

Components:

Diethylenetriamine:

Distribution among environmental compartments : Koc: 19111

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Distribution among environmental compartments : Koc: 1195

2-aminoethanol:

Distribution among environmental compartments : Koc: 1.167

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 2922
Proper shipping name	:	Corrosive liquid, toxic, n.o.s. (DIETHYLENETRIAMINE, cycloaliphatic polyamine)
Class	:	8
Subsidiary risk	:	6.1
Packing group	:	II
Labels	:	Corrosive, Toxic
Packing instruction (cargo aircraft)	:	855
Packing instruction (passenger aircraft)	:	851

IMDG-Code

UN number	:	UN 2922
Proper shipping name	:	CORROSIVE LIQUID, TOXIC, N.O.S. (DIETHYLENETRIAMINE, cycloaliphatic polyamine)
Class	:	8
Subsidiary risk	:	6.1
Packing group	:	II
Labels	:	8 (6.1)
EmS Code	:	F-A, S-B
Marine pollutant	:	yes(4,4'-Isopropylidenediphenol, cycloaliphatic polyamine)

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 2922
Proper shipping name	:	Corrosive liquids, toxic, n.o.s. (DIETHYLENETRIAMINE, cycloaliphatic polyamine)
Class	:	8
Subsidiary risk	:	6.1
Packing group	:	II
Labels	:	CORROSIVE, TOXIC
ERG Code	:	154
Marine pollutant	:	yes(4,4'-Isopropylidenediphenol, cycloaliphatic polyamine)

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
Specific target organ toxicity (single or repeated exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation

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

4,4'-isopropylidenediphenol	80-05-7	>= 30 - < 50 %

This product does not contain any hazardous air pollutants (HAP), 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 2,2'-iminodiethanol, 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
NZIoC	:	On the inventory, or in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory

Inventories

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

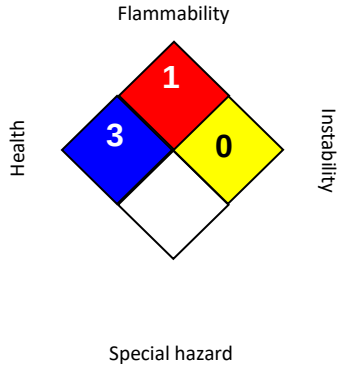
TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

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.

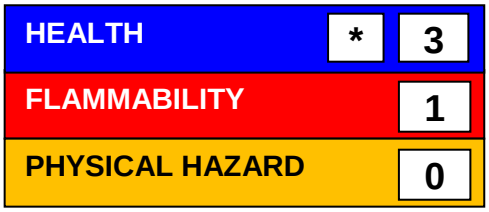
SECTION 16. OTHER INFORMATION

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	:	01/25/2022
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)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA P0 / TWA	:	8-hour time weighted average
OSHA P0 / STEL	:	Short-term exposure limit
OSHA Z-1 / 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.

EPOCAST® 1618 D US

Version	Revision Date:	SDS Number:	Date of last issue: 05/20/2020
2.0	02/01/2022	400001009082	Date of first issue: 04/12/2017

Print Date 03/17/2022

SECTION 1. IDENTIFICATION

Product name : EPOCAST® 1618 D 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 of person responsible for the SDS : 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

Eye irritation : Category 2A

Skin sensitisation : Category 1

Germ cell mutagenicity : Category 1B

Carcinogenicity : Category 2

Reproductive toxicity : Category 2

Short-term (acute) aquatic hazard : Category 2

Chronic aquatic toxicity : Category 2

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H340 May cause genetic defects.
H351 Suspected of causing cancer.
H361 Suspected of damaging fertility or the unborn child.
H411 Toxic to aquatic life with long lasting effects.

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.
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:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P391 Collect spillage.
Storage:
P405 Store locked up.
Disposal:
P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Epoxy constituents

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	20 - 30

Glass, oxide, chemicals	65997-17-3	10 - 20
2,3-epoxypropyl o-tolyl ether	2210-79-9	10 - 20
Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	9003-36-5	5 - 10
2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate	15625-89-5	5 - 10
dimethyl methylphosphonate	756-79-6	1 - 5
Siloxanes and Silicones, di-Me, 3-hydroxypropyl Me, ethoxylated	68937-54-2	1 - 5
dimethyl phosphonate	868-85-9	0.1 - 1
silicon dioxide	7631-86-9	0.1 - 1
melamine	108-78-1	0.1 - 1
ethylbenzene	100-41-4	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	:	Immediately flush eye(s) with plenty of water. Remove contact lenses. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Induce vomiting immediately and call a physician. 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 firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Carbon oxides Halogenated compounds Carbon dioxide (CO2) Carbon monoxide Silicon oxides
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	:	In the event of fire, wear self-contained breathing apparatus.

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. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Keep in properly labelled containers.
Materials to avoid	:	For incompatible materials please refer to Section 10 of this SDS.
Recommended storage temperature	:	36 - 104 °F / 2 - 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	Control	Basis

		(Form of exposure)	parameters / Permissible concentration	
2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate	15625-89-5	TWA	1 mg/m3	US WEEL
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
ethylbenzene	100-41-4	TWA	20 ppm	ACGIH
		TWA	100 ppm 435 mg/m3	NIOSH REL
		ST	125 ppm 545 mg/m3	NIOSH REL
		TWA	100 ppm 435 mg/m3	OSHA Z-1
		STEL	125 ppm 545 mg/m3	OSHA P0
		TWA	100 ppm 435 mg/m3	OSHA P0

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
ethylbenzene	100-41-4	Sum of mandelic acid and phenyl glyoxylic acid	Urine	End of shift (As soon as possible after exposure ceases)	0.15 g/g creatinine	ACGIH BEI

Personal protective equipment

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other

circumstance where air purifying respirators may not provide adequate protection.

Hand protection

Material	:	butyl-rubber
Break through time	:	> 8 h
Material	:	Solvent-resistant gloves (butyl-rubber)
Material	:	Nitrile rubber
Break through time	:	10 - 480 min

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	:	off-white
Odour	:	slight
Odour Threshold	:	No data is available on the product itself.
pH	:	substance/mixture is non-soluble (in water)
Melting point/freezing point	:	No data available
Boiling point	:	> 392 °F / > 200 °C
Flash point	:	> 212 °F / > 100 °C Method: Pensky-Martens closed cup
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.

Flammability (liquids)	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Vapour pressure	:	< 1 hPa (68 °F / 20 °C)
Relative vapour density	:	No data is available on the product itself.
Relative density	:	No data is available on the product itself.
Density	:	0.63 - 0.66 g/cm3 (77 °F / 25 °C)
Solubility(ies)		
Water solubility	:	insoluble (68 °F / 20 °C)
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	:	> 392 °F / > 200 °C
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.
Molecular weight	:	No data available
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	:	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 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

2,3-epoxypropyl o-tolyl ether:

Acute oral toxicity	:	LD50 (Rat, male and female): > 5,000 mg/kg Method: OECD Test Guideline 401
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 6100 ppb Exposure time: 4 h Test atmosphere: vapour Method: OECD Test Guideline 403

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

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

2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg Assessment: The substance or mixture has no acute oral toxicity
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 0.55 mg/l

Exposure time: 6 h
Test atmosphere: vapour
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rabbit): 5,170 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

dimethyl methylphosphonate:

Acute oral toxicity : LD50 (Rat, male and female): > 5,000 mg/kg
Method: OECD Test Guideline 401
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : LC50 (Rat, male and female): > 2589 mg/m3
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rat, male and female): > 4,640 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Siloxanes and Silicones, di-Me, 3-hydroxypropyl Me, ethoxylated:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
Method: estimated

Acute inhalation toxicity : LC50 (Rat, male and female): > 0.68 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity

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

dimethyl phosphonate:

Acute oral toxicity : LD50 Oral (Rat, male): 3,283 mg/kg
Method: OECD Test Guideline 401

LD50 Oral (Rat, female): 3,040 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC50 (Rat, male): > 7,100 mg/m3
Exposure time: 6 h
Test atmosphere: vapour

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

melamine:

Acute oral toxicity : LD50 (Rat, male and female): 3,161 - 3,828 mg/kg

Acute inhalation toxicity : LC50 (Rat, male and female): > 5190 mg/m3
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The substance or mixture has no acute inhalation toxicity

ethylbenzene:

Acute oral toxicity : LD50 (Rat): 3,500 - 5,460 mg/kg
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): 17.3 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Assessment: The component/mixture is moderately toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rabbit): 15,400 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

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

2,3-epoxypropyl o-tolyl ether:

Assessment : Irritating to skin.
Result : Severe skin irritation

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	Irritating to skin.

2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Species	:	Rabbit
Exposure time	:	4 h
Method	:	OECD Test Guideline 404
Result	:	Skin irritation
GLP	:	yes

dimethyl methylphosphonate:

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

Siloxanes and Silicones, di-Me, 3-hydroxypropyl Me, ethoxylated:

Result	:	slight irritation

silicon dioxide:

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

melamine:

Species	:	Rabbit
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

2,3-epoxypropyl o-tolyl ether:

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

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Species	:	Rabbit
Result	:	No eye irritation

Method : OECD Test Guideline 405

2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Species : Rabbit
Result : Eye irritation
Method : OECD Test Guideline 405

dimethyl methylphosphonate:

Species : Rabbit
Result : Eye irritation
Method : OECD Test Guideline 405

Siloxanes and Silicones, di-Me, 3-hydroxypropyl Me, ethoxylated:

Result : slight irritation

dimethyl phosphonate:

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

silicon dioxide:

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

melamine:

Species : Rabbit
Remarks : slight irritation

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.

2,3-epoxypropyl o-tolyl ether:

Exposure routes : Skin

Species	:	Guinea pig
Assessment	:	May cause sensitisation by skin contact.
Method	:	OECD Test Guideline 406
Result	:	May cause sensitisation by skin contact.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Exposure routes	:	Skin
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	May cause sensitisation by skin contact.

2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Result	:	Probability or evidence of high skin sensitisation rate in humans

dimethyl methylphosphonate:

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

Exposure routes	:	Skin
Species	:	Humans
Method	:	Patch Test 24 Hrs.
Result	:	Does not cause skin sensitisation.

Siloxanes and Silicones, di-Me, 3-hydroxypropyl Me, ethoxylated:

Species	:	Guinea pig
Assessment	:	Did not cause sensitisation on laboratory animals.
Result	:	Did not cause sensitisation on laboratory animals.

dimethyl phosphonate:

Test Type	:	Maximisation Test
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Probability or evidence of skin sensitisation in humans
GLP	:	yes

melamine:

Exposure routes	:	Skin
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Does not cause skin sensitisation.

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

2,3-epoxypropyl o-tolyl ether:

Genotoxicity in vitro : Test Type: Ames test
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive

Genotoxicity in vivo : Application Route: Oral
Dose: 2000 mg/kg
Method: OECD Test Guideline 474
Result: negative

Application Route: Dermal
Exposure time: 5 d
Dose: 500 mg/kg
Result: negative

Application Route: Dermal
Exposure time: 8 Weeks
Dose: 1.5 mg/kg
Method: OECD Test Guideline 478
Result: positive

Germ cell mutagenicity - Assessment : Positive results from in vitro mammalian mutagenicity assays, chemical structure activity relationship to known germ cell mutage

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: positive

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: positive

Genotoxicity in vivo : Cell type: Somatic
Application Route: Oral
Exposure time: 48 h
Dose: 2000 mg/kg
Method: OECD Test Guideline 474
Result: negative

Cell type: Somatic
Application Route: Oral
Dose: 2000 mg/kg
Method: OECD Test Guideline 486
Result: negative

2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

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

Test Type: reverse mutation assay
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Genotoxicity in vivo : Test Type: Micronucleus test
Species: Mouse (male and female)
Cell type: Bone marrow
Application Route: Oral
Dose: 437.5, 875 and 1750 mg/kg bw
Method: OECD Test Guideline 474
Result: negative

Test Type: comet assay
Method: OECD Test Guideline 489
Result: negative

dimethyl methylphosphonate:

Genotoxicity in vivo : Method: OECD Test Guideline 478
Result: positive

Germ cell mutagenicity - Assessment : In vivo tests showed mutagenic effects

Siloxanes and Silicones, di-Me, 3-hydroxypropyl Me, ethoxylated:

Germ cell mutagenicity - : In vitro tests did not show mutagenic effects, Animal testing

Assessment : did not show any mutagenic effects.

dimethyl phosphonate:

Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive
GLP: yes

Test Type: Ames test
Test system: Salmonella typhimurium
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: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: positive
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: positive
GLP: yes

Genotoxicity in vivo : Test Type: Micronucleus test
Species: Mouse (male and female)
Application Route: Intraperitoneal injection
Method: OECD Test Guideline 474
Result: negative
GLP: yes

Test Type: Micronucleus test
Species: Mouse (male)
Cell type: Bone marrow
Application Route: Intraperitoneal injection
Dose: 0, 250, 500 mg/kg bw/d
Method: OECD Test Guideline 474
Result: positive
GLP: yes

Germ cell mutagenicity - Assessment : In vitro tests showed 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

melamine:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: Chromosome aberration test in vitro
Result: negative

Metabolic activation: with and without metabolic activation
Method: In vitro mammalian cell gene mutation test
Result: negative

Genotoxicity in vivo : Application Route: Intraperitoneal injection
Method: Skin Sensitization
Result: negative

ethylbenzene:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Genotoxicity in vivo : Method: OECD Test Guideline 474
Result: negative

Method: OECD Test Guideline 486
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

2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Species	:	Mouse

Species	:	Rat

dimethyl methylphosphonate:

Species	:	Rat, male and female
Application Route	:	Oral
Exposure time	:	103 weeks
Dose	:	500 mg/kg
Frequency of Treatment	:	5 daily
Result	:	Not classified due to inconclusive data.
Target Organs	:	Kidney

Target Organs	:	Cardio-vascular system

dimethyl phosphonate:

Species	:	Rat, male and female
Application Route	:	Oral

Exposure time	:	103 weeks
NOAEL	:	200 mg/kg body weight
LOAEL	:	100 mg/kg body weight
Method	:	OECD Test Guideline 451
Result	:	negative

Species	:	Mouse, male and female
Application Route	:	Oral
Exposure time	:	103 weeks
NOAEL	:	200
LOAEL	:	100 mg/kg body weight
Method	:	OECD Test Guideline 451

Carcinogenicity - Assessment	:	Limited evidence of carcinogenicity in animal studies

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
	Group 2B: Possibly carcinogenic to humans 2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate	 15625-89-5
	Group 2B: Possibly carcinogenic to humans melamine	 108-78-1
	Group 2B: Possibly carcinogenic to humans ethylbenzene	 100-41-4
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

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
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
General Toxicity Maternal: NOAEL: 30 mg/kg body weight
Result: No teratogenic effects

2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
Dose: 0, 30, 100, 300 milligram per kilogram
General Toxicity - Parent: NOAEL: 300 mg/kg body weight
Fertility: NOAEL: 300 mg/kg body weight
Method: OECD Test Guideline 422
Result: Animal testing did not show any effects on fertility.
GLP: yes

Effects on foetal development : Species: Rat, female
Application Route: Oral
Dose: 500 milligram per kilogram
Duration of Single Treatment: 10 d
General Toxicity Maternal: NOAEL: < 500 mg/kg body weight
Embryo-foetal toxicity: NOAEL: > 500 mg/kg body weight
Method: OECD Test Guideline 414
Result: No effects on fertility and early embryonic development were detected.
GLP: yes

Species: Rabbit
Application Route: Oral
General Toxicity Maternal: NOAEL: > 130 mg/kg body weight
Embryo-foetal toxicity: NOAEL: > 130 mg/kg body weight
Method: OECD Test Guideline 414
Result: No effects on fertility and early embryonic development were detected.
GLP: yes

dimethyl methylphosphonate:

Effects on fertility : Species: Rat, male
Application Route: Oral

Effects on foetal development : Species: Rat, female
Application Route: Oral
General Toxicity Maternal: LOAEL: 1,000 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

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

dimethyl phosphonate:

Effects on fertility : Test Type: Reproduction / Developmental Toxicity Screening Test
Species: Rat, male and female
Application Route: Oral
Dose: 0,30,90,270 milligram per kilogram
General Toxicity - Parent: NOEL: 90 mg/kg body weight
Method: OECD Test Guideline 421

Effects on foetal : Species: Rat

development

Application Route: Oral
Dose: 0,30,90,270 milligram per kilogram
General Toxicity Maternal: NOEL: 90 mg/kg body weight
Developmental Toxicity: NOEL: 90 mg/kg body weight
Method: OECD Test Guideline 421

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

melamine:

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

ethylbenzene:

Effects on fertility : General Toxicity - Parent: NOAEL: 500 ppm
Method: OECD Test Guideline 416

Effects on foetal development : General Toxicity Maternal: NOAEL: 500 ppm
Teratogenicity: NOAEL: 2,000 ppm
Developmental Toxicity: NOAEL: 500 ppm

STOT - single exposure

No data available

STOT - repeated exposure

Components:

ethylbenzene:

Exposure routes : Inhalation
Target Organs : Lungs, Liver, Kidney, Central nervous system
Assessment : May cause damage to organs through prolonged or repeated exposure.

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

2,3-epoxypropyl o-tolyl ether:

Species	:	Rat, male and female
NOEC	:	4 ppm
Test atmosphere	:	vapour
Exposure time	:	672 h
Number of exposures	:	6 h
Method	:	OECD Test Guideline 412

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Species	:	Rat, male and female
NOAEL	:	250 mg/kg
Application Route	:	Ingestion
Exposure time	:	13 Weeks
Number of exposures	:	7 d
Method	:	Subchronic toxicity

2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Species	:	Rat, male and female
NOAEL	:	300 mg/kg
Application Route	:	Oral
Exposure time	:	15 - 29 d 6 h
Number of exposures	:	7 days/week
Dose	:	0/30/100/300 mg/kg bw/day
Control Group	:	yes
Method	:	OECD Test Guideline 422
GLP	:	yes

Species	:	Mouse, male and female
NOAEL	:	0.3 mg/kg
Application Route	:	Dermal
Exposure time	:	105 - 106 weeks
Number of exposures	:	5 days/week
Dose	:	0.3/1/3 mg/kg
Method	:	OECD Test Guideline 453
GLP	:	yes

Species	:	Rat, male and female
LOAEL	:	0.3 mg/kg
Application Route	:	Dermal
Exposure time	:	104 - 105 weeks
Number of exposures	:	5 days/week
Dose	:	0.3/1/3 mg/kg
Method	:	OECD Test Guideline 453
GLP	:	yes

Species	:	Mouse, male and female
NOAEL	:	>= 200 mg/kg
Application Route	:	Dermal
Exposure time	:	16 d
Number of exposures	:	5 days/week
Dose	:	12.5/25/50/100/200 mg/kg

Species	:	Rat, male and female
NOAEL	:	>= 200 mg/kg
Application Route	:	Dermal
Exposure time	:	16 d
Number of exposures	:	5 days/week
Dose	:	12.5/25/50/100/200 mg/kg

Species	:	Mouse, male and female
NOAEL	:	> 12 mg/kg
Application Route	:	Dermal
Exposure time	:	14 weeks
Number of exposures	:	5 days/week
Dose	:	0.75/1.5/3/6/12 mg/kg
GLP	:	yes

Species	:	Rat, male and female
NOAEL	:	> 12 mg/kg
Application Route	:	Dermal
Exposure time	:	14 weeks
Number of exposures	:	5 days/week

Dose	:	0.75/1.5/3/6/12 mg/kg
GLP	:	yes

dimethyl methylphosphonate:

Species	:	Rat, male and female
LOEL	:	65 - 71 mg/kg
Application Route	:	Ingestion
Exposure time	:	2,160 h
Method	:	Subchronic toxicity

dimethyl phosphonate:

Species	:	Rat, female
NOAEL	:	100 mg/kg
LOAEL	:	200 mg/kg
Application Route	:	oral (gavage)
Exposure time	:	13 weeks
Number of exposures	:	5 days/week
Dose	:	0, 25, 50, 100, 200, 400 mg/kg
Method	:	OECD Test Guideline 408

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

melamine:

Species	:	Rat, male and female
LOAEL	:	72 mg/kg
Application Route	:	Ingestion
Exposure time	:	13 Weeks
Method	:	Subchronic toxicity

ethylbenzene:

Species	:	Rat, male and female
NOAEL	:	75 mg/kg bw
Application Route	:	oral (gavage)
Exposure time	:	28 d
Dose	:	75/250/750 mg/kg bw
Control Group	:	yes
Method	:	OECD Test Guideline 407
Target Organs	:	Liver
Remarks	:	Subacute toxicity

Species	:	Rat, male and female
NOAEL	:	75 mg/kg bw
Application Route	:	oral (gavage)
Exposure time	:	90 d
Dose	:	75/250/750 mg/kg bw

Control Group	:	yes
Method	:	OECD Test Guideline 408

Species	:	Mouse, male and female
NOAEL	:	3.4 mg/l
Application Route	:	Inhalation
Exposure time	:	28 d
Dose	:	0,4/1,7/3,4 mg/L
Control Group	:	yes
Method	:	OECD Test Guideline 412

Species	:	Rat, male and female
NOAEL	:	1084
NOAEL	:	mg/m3
Application Route	:	inhalation (vapour)
Exposure time	:	104 week
Dose	:	325/1084/3251 mg/m3
Control Group	:	yes
Method	:	OECD Test Guideline 453

Species	:	Rat, male and female
NOAEL	:	4.74 mg/l
Application Route	:	Inhalation
Exposure time	:	13 week
Dose	:	0,47/1,18/2,37/3,55/4,74 mg/L
Control Group	:	yes
Method	:	OECD Test Guideline 413
Target Organs	:	Liver

Species	:	Mouse, male and female
NOAEL	:	3251
NOAEL	:	mg/m3
Application Route	:	Inhalation
Exposure time	:	104 week
Dose	:	325/1084/3251 mg/m3
Control Group	:	yes
Method	:	OECD Test Guideline 453

Species	:	Rabbit, male and female
NOAEL	:	6.8 mg/l
Application Route	:	Inhalation
Exposure time	:	28 d
Dose	:	1,7/3,4/6,8 mg/L
Control Group	:	yes
Method	:	OECD Test Guideline 412

Aspiration toxicity

Components:

ethylbenzene:

May be fatal if swallowed and enters airways.

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

2,3-epoxypropyl o-tolyl ether:

Toxicity to fish : LC50: 13 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

LC50 (Oncorhynchus mykiss (rainbow trout)): 2.8 - 5.1 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 203

LC50 (Brachydanio rerio (zebrafish)): ca. 6.5 mg/l
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)): ca. 3.3 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 (Selenastrum capricornutum (green algae)): 5.1 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Toxicity to microorganisms : IC50: > 100 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Toxicity to fish : LC50 (Fish): 2.54 mg/l
Exposure time: 96 h
Method: Calculation method

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 2.55 mg/l Exposure time: 48 h Method: Calculation method
Toxicity to algae/aquatic plants	:	EC50 (Selenastrum capricornutum (green algae)): 1.8 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)): 0.3 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211 Remarks: Information given is based on data obtained from similar substances.
Toxicity to microorganisms	:	IC50 (activated sludge): > 100 mg/l Exposure time: 3 h Test Type: static test Test substance: Fresh water

2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Toxicity to fish	:	LC50 (Leuciscus idus (Golden orfe)): 1.47 mg/l Exposure time: 96 h Test Type: static test Method: DIN 38412 LC50 (Danio rerio (zebra fish)): 0.87 mg/l Exposure time: 96 h Test Type: semi-static test Method: OECD Test Guideline 203 GLP: yes
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna (Water flea)): 19.9 mg/l Exposure time: 48 h Test Type: static test Method: Other guidelines
Toxicity to algae/aquatic plants	:	EC50 (Desmodesmus subspicatus (green algae)): 4.86 mg/l Exposure time: 96 h Test Type: static test Method: Directive 67/548/EEC, Annex V, C.3. GLP: no EC10 (Desmodesmus subspicatus (green algae)): 0.57 mg/l Exposure time: 96 h Test Type: static test Method: Directive 67/548/EEC, Annex V, C.3.
Toxicity to microorganisms	:	EC20 (activated sludge): 625 mg/l Exposure time: 30 min Test Type: static test Method: ISO 8192

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

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

dimethyl methylphosphonate:

Toxicity to fish : LC50: > 1,000 mg/l
Exposure time: 48 h

Toxicity to microorganisms : IC50: > 300 mg/l
Exposure time: 3 h

Ecotoxicology Assessment

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

Siloxanes and Silicones, di-Me, 3-hydroxypropyl Me, ethoxylated:

Toxicity to fish : EC50 (Fish): 10 - 100 mg/l
Remarks: Based on data from similar materials

LC50 (Cyprinodon variegatus (sheepshead minnow)): > 1,080 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

LC50 (Oncorhynchus mykiss (rainbow trout)): 892 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1,040 mg/l
Exposure time: 48 h
Test Type: static test
Remarks: Based on data from similar materials

LC50 (Mysidopsis bahia (opossum shrimp)): 11 mg/l
Exposure time: 96 h
Test Type: static test
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : NOECr (Skeletonema costatum (marine diatom)): 3 mg/l
Exposure time: 72 h
Test Type: static test
Remarks: Based on data from similar materials

ErC50 (Skeletonema costatum (marine diatom)): 14 mg/l
Exposure time: 72 h
Test Type: static test
Remarks: Based on data from similar materials

ErC50 (Lemna gibba G3 (gibbous duckweed)): > 1,020 mg/l
Exposure time: 7 d
Test Type: static test
Remarks: Based on data from similar materials

Toxicity to microorganisms : EC50 (activated sludge): 115 mg/l
Exposure time: 3 h
Remarks: Based on data from similar materials

dimethyl phosphonate:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 15.6 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Method: Tested according to Annex V of Directive 67/548/EEC.
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 24.8 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Method: Tested according to Directive 92/69/EEC.
GLP: yes

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): >= 100 mg/l
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201
GLP: yes

Toxicity to microorganisms : EC50 (activated sludge): > 10,000 mg/l
Exposure time: 3 h
Test Type: static test
Method: OECD Test Guideline 209
GLP: yes

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

melamine:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 3,000 mg/l Exposure time: 96 h Test Type: semi-static test Test substance: Fresh water
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: Aquatic Invertebrate Acute Toxicity Test, Freshwater Daphnids
Toxicity to algae/aquatic plants	:	EC50 (Selenastrum capricornutum (green algae)): 325 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water
Toxicity to fish (Chronic toxicity)	:	NOEC (Oncorhynchus mykiss (rainbow trout)): 1,500 mg/l Exposure time: 28 d Test Type: semi-static test Test substance: Fresh water
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 18 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water

ethylbenzene:

Toxicity to fish	:	LC50: 4.2 mg/l Exposure time: 96 h LC50: 9.2 mg/l Exposure time: 96 h LC50: 12.1 mg/l Exposure time: 96 h LC50: 5.1 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50: 1.81 - 2.38 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	IC50: 4.6 mg/l Exposure time: 72 h EC50: 3.6 mg/l Exposure time: 96 h NOEC: 3.4 mg/l Exposure time: 96 h EC50: 7.7 mg/l Exposure time: 96 h

Toxicity to fish (Chronic toxicity) : NOEL: 0.96 mg/l
Exposure time: 7 d

Ecotoxicology Assessment

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

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

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

2,3-epoxypropyl o-tolyl ether:

Biodegradability : Inoculum: activated sludge
Concentration: 10 mg/l
Result: Not readily biodegradable.
Biodegradation: 17 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

Stability in water : Degradation half life (DT50): 10.5 hrs (25 °C) pH: 4
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 9.4 hrs (25 °C) pH: 7
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 8.96 hrs (25 °C) pH: 9
Method: OECD Test Guideline 111
Remarks: Fresh water

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Biodegradability : Inoculum: activated sludge
Concentration: 3 mg/l
Result: Not biodegradable
Biodegradation: ca. 0 %
Exposure time: 28 d
Method: Directive 67/548/EEC Annex V, C.4.E.

2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Biodegradability : aerobic
Inoculum: activated sludge
Concentration: 33 mg/l
Result: Readily biodegradable.
Biodegradation: 82 - 90 %
Exposure time: 28 d
Method: OECD Test Guideline 301B
GLP: yes

dimethyl methylphosphonate:

Biodegradability : Result: Not biodegradable
Biodegradation: 8 %
Exposure time: 21 d
Method: Simulation Test - Aerobic Sewage Treatment. A: Activated Sludge Units

Biochemical Oxygen Demand (BOD) : 11 mgO2/g
Incubation time: 5 d

Chemical Oxygen Demand (COD) : 895 mgO2/g

Siloxanes and Silicones, di-Me, 3-hydroxypropyl Me, ethoxylated:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 15.6 %
Exposure time: 28 d
Method: OECD Test Guideline 301B
Remarks: Based on data from similar materials

dimethyl phosphonate:

Biodegradability : Result: Not readily biodegradable.

melamine:

Biodegradability : Inoculum: activated sludge
Concentration: 100 mg/l
Result: Not readily biodegradable.
Biodegradation: < 10 %
Exposure time: 28 d
Method: OECD Test Guideline 302B

ethylbenzene:

Biodegradability : Result: Readily biodegradable.

Biodegradation: > 60 %
Exposure time: 28 d

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

2,3-epoxypropyl o-tolyl ether:

Partition coefficient: n-octanol/water	:	log Pow: 2.5 (70 °F / 21 °C) Method: OECD Test Guideline 107

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Bioaccumulation	:	Species: Fish Bioconcentration factor (BCF): 150 Remarks: Does not bioaccumulate.
Partition coefficient: n-octanol/water	:	log Pow: 2.7 - 3.6 Method: OECD Test Guideline 117

2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Partition coefficient: n-octanol/water	:	log Pow: 4.35 (68 °F / 20 °C) Method: Calculation method

dimethyl methylphosphonate:

Partition coefficient: n-octanol/water	:	log Pow: -0.61

dimethyl phosphonate:

Partition coefficient: n-octanol/water	:	log Pow: -1.13 Method: QSAR GLP: no

melamine:

Bioaccumulation	:	Bioconcentration factor (BCF): 0.05
Partition coefficient: n-octanol/water	:	log Pow: -1.22 (68 °F / 20 °C) pH: 8 Method: Partition coefficient

ethylbenzene:

Bioaccumulation	:	Bioconcentration factor (BCF): 1.9
Partition coefficient: n-	:	log Pow: 3.15

octanol/water

Mobility in soil

Components:

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

Distribution among environmental compartments : Koc: 445

2,3-epoxypropyl o-tolyl ether:

Distribution among environmental compartments : Koc: ca. 210
Method: OECD Test Guideline 121

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Distribution among environmental compartments : Koc: 4460
Method: OECD Test Guideline 121

2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Distribution among environmental compartments : OECD Test Guideline 121
log Koc: 2.2
Method: OECD Test Guideline 121

melamine:

Distribution among environmental compartments : Koc: 1.7

ethylbenzene:

Distribution among environmental compartments : Koc: 520

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.

Components:

dimethyl methylphosphonate:

Adsorbed organic bound halogens (AOX) : 0 %

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. (TRIMETHYLOLPROPANE TRIACRYLATE, 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. (TRIMETHYLOLPROPANE TRIACRYLATE, 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. (TRIMETHYLOLPROPANE TRIACRYLATE, 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	:	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
Germ cell mutagenicity
Carcinogenicity
Reproductive toxicity
Skin corrosion or irritation
Serious eye damage or eye irritation

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

ethylbenzene	100-41-4	>= 0.1 - < 1 %

This product does not contain any hazardous air pollutants (HAP), 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 silicon dioxide, ethylbenzene, pyrocatechol, which is/are known to the State of California to cause cancer, and methanol, toluene, 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
NZIoC	:	On the inventory, or in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory

IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory

Inventories

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

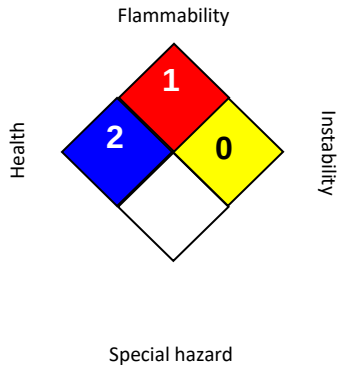
TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

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.

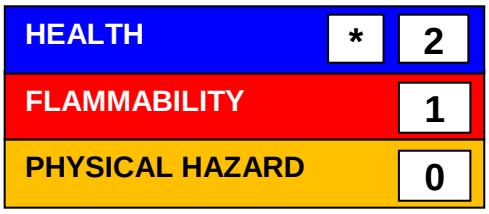
SECTION 16. OTHER INFORMATION

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	:	02/01/2022
ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	:	ACGIH - Biological Exposure Indices (BEI)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA CARC	:	OSHA Specifically Regulated Chemicals/Carcinogens
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-3	:	USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
US WEEL	:	USA. Workplace Environmental Exposure Levels (WEEL)
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
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA CARC / PEL	:	Permissible exposure limit (PEL)
OSHA P0 / TWA	:	8-hour time weighted average
OSHA P0 / STEL	:	Short-term exposure limit
OSHA Z-1 / TWA	:	8-hour time weighted average
OSHA Z-3 / TWA	:	8-hour time weighted average
US WEEL / TWA	:	8-hr TWA

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.