

EPOCAST® 35 A US

Version 1.1 Revision Date: 03/28/2023 SDS Number: 400001008328 Date of last issue: 12/12/2016
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Print Date 04/20/2023

SECTION 1. IDENTIFICATION

Product name : EPOCAST® 35 A US

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC
Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)
Telephone : Non-Emergency: (800) 257-5547
E-mail address : Global_Product_EHS_AdMat@huntsman.com
Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Epoxy constituents

SECTION 2. HAZARDS IDENTIFICATION**GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)**

Skin irritation : Category 2
Eye irritation : Category 2A
Skin sensitisation : Category 1
Germ cell mutagenicity : Category 2
Specific target organ toxicity - repeated exposure (Oral) : Category 2 (Nasal inner lining, Gastrointestinal tract, female reproductive organs, Stomach)
Short-term (acute) aquatic hazard : Category 2
Long-term (chronic) aquatic hazard : Category 2

GHS label elementsHazard pictograms : 

Signal word : Warning

Hazard statements : H315 Causes skin irritation.

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H317 May cause an allergic skin reaction.
 H319 Causes serious eye irritation.
 H341 Suspected of causing genetic defects.
 H373 May cause damage to organs (Nasal inner lining, Gastrointestinal tract, female reproductive organs, Stomach) 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.
 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 waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

| Chemical name | CAS-No. | Concentration (% w/w) |
|---|------------|-----------------------|
| 7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate | 2386-87-0 | 50 - 70 |
| Phenol, polymer with formaldehyde, glycidyl ether | 28064-14-4 | 30 - 50 |

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| 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane | 1675-54-3 | 5 - 10 |
| p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline | 5026-74-4 | 1 - 5 |

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.

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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
Carbon oxides
Halogenated compounds
Nitrogen oxides (NO_x)
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods and materials for containment and cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

- Advice on protection against : Normal measures for preventive fire protection.

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fire and explosion

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 - 46 °F / 2 - 8 °C

Further information on storage stability : Stable under normal conditions.

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

Contains no substances with occupational exposure limit values.

Personal protective equipment

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

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection

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|--------------------------|---|--|
| Material | : | butyl-rubber |
| Break through time | : | > 8 h |
| Material | : | Solvent-resistant gloves (butyl-rubber) |
| Material | : | Nitrile rubber |
| Break through time | : | 10 - 480 min |
| Material | : | Neoprene gloves |
| 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 | : | liquid |
| Colour | : | amber |
| Odour | : | slight |
| 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 |
| Boiling point | : | > 392 °F / > 200 °C |
| Flash point | : | 244 °F / 118 °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. |

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Upper explosion limit / Upper flammability limit : No data is available on the product itself.

Lower explosion limit / Lower flammability limit : No data is available on the product itself.

Vapour pressure : < 0.001 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 : 1.2 g/cm³ (77 °F / 25 °C)

Solubility(ies)
Water solubility : practically 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
Viscosity, dynamic : 5,000 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 : No decomposition if stored and applied as directed.

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products
Hazardous decomposition products : carbon dioxide
carbon monoxide
Halogenated compounds
Nitrogen oxides (NOx)

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

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

Components:**7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

Acute oral toxicity : LD50 (Rat, male and female): ca. 5,000 mg/kg
Method: OECD Test Guideline 401
GLP: yes
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : No-observed-effect level (Rat, male and female): >= 5.19 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 436
GLP: yes
Assessment: The substance or mixture has no acute inhalation toxicity

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

Phenol, polymer with formaldehyde, glycidyl ether:

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

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

2,2'-[(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

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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

p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline:

Acute oral toxicity : LD50 (Rat, male and female): 1,037 mg/kg
 Method: OECD Test Guideline 401
 Assessment: The component/mixture is moderately toxic after single ingestion.

Acute dermal toxicity : LD50 (Rat, male and female): > 4,000 mg/kg
 Method: OECD Test Guideline 402
 Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation**Components:****7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

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

Phenol, polymer with formaldehyde, glycidyl ether:

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

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.

p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline:

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

Serious eye damage/eye irritation**Components:****7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

Species : Rabbit
 Result : No eye irritation

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Assessment : No eye irritation
 Method : OECD Test Guideline 405
 GLP : yes

Phenol, polymer with formaldehyde, glycidyl ether:

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

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

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

p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline:

Species : Rabbit
 Result : slight irritation
 Assessment : No eye irritation
 Method : Other guidelines

Respiratory or skin sensitisation**Components:****7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

Test Type : Maximisation Test
 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.

Phenol, polymer with formaldehyde, glycidyl ether:

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

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.

p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline:

Test Type : Local lymph node assay (LLNA)
 Species : Mouse
 Assessment : Probability or evidence of high skin sensitisation rate in humans
 Method : OECD Test Guideline 429

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

Remarks : Information given is based on data obtained from similar substances.

Germ cell mutagenicity**Components:****7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

Genotoxicity in vitro : Test Type: gene mutation test
 Test system: mouse lymphoma cells
 Metabolic activation: with and without metabolic activation
 Result: positive
 GLP: yes

Test Type: gene mutation test
 Test system: Chinese hamster ovary cells
 Metabolic activation: with and without metabolic activation
 Result: negative
 GLP: no

Test Type: sister chromatid exchange assay
 Test system: Chinese hamster ovary cells
 Metabolic activation: without metabolic activation
 Result: positive
 GLP: no

Test Type: reverse mutation assay
 Test system: Salmonella tryphimurium and E. coli
 Metabolic activation: Metabolic activation
 Method: OECD Test Guideline 471
 Result: positive
 GLP: yes

Test Type: unscheduled DNA synthesis assay
 Test system: rat hepatocytes
 Metabolic activation: without metabolic activation
 Method: OECD Test Guideline 482
 Result: Not classified due to inconclusive data.

Genotoxicity in vivo : Test Type: In vivo micronucleus test
 Species: Mouse (male and female)
 Cell type: Somatic
 Application Route: Intraperitoneal injection
 Dose: 0.5, 1 and 2.25g/kg
 Method: Directive 67/548/EEC, Annex V, B.12.
 Result: negative
 GLP: yes

Test Type: unscheduled DNA synthesis assay
 Species: Rat (male)
 Cell type: Liver cells
 Application Route: Oral
 Dose: 500, 1000, 2000 mg/kg bw
 Method: OECD Test Guideline 486

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Result: negative
GLP: yes

Test Type: Transgenic rodent somatic cell gene mutation assay

Species: Transgenic mouse (male)

Cell type: Germ + somatic

Application Route: Oral

Dose: 250/500/1000 mg/kg bw/day

Method: OECD Test Guideline 488

Result: Not classified due to inconclusive data.

GLP: yes

Germ cell mutagenicity - Assessment : In vitro tests showed mutagenic effects which were not observed with in vivo test.

Phenol, polymer with formaldehyde, glycidyl ether:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Result: positive

Concentration: 0 - 5000 ug/plate

Metabolic activation: with and without metabolic activation

Result: positive

Genotoxicity in vivo : Cell type: Germ
Application Route: Oral
Result: negative

Cell type: Somatic

Application Route: Oral

Dose: 0 - 5000 mg/kg

Result: negative

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)

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Cell type: Somatic
 Application Route: Oral
 Dose: 50,250,500,1000 mg/kg bw/day
 Method: OECD Test Guideline 488
 Result: negative

p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline:

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

Test Type: reverse mutation assay
 Test system: Salmonella typhimurium
 Method: OECD Test Guideline 471
 Result: positive

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

Genotoxicity in vivo : Test Type: In vivo micronucleus test
 Species: Mouse (male)
 Application Route: Oral
 Dose: 438, 875, 1750mg/kg bw
 Method: OECD Test Guideline 474
 Result: negative
 Remarks: Information given is based on data obtained from similar substances.

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

Carcinogenicity**Components:****7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

Remarks : Mixtures of Bisphenol A, Bisphenol F or Novolac epoxy resins and this cycloaliphatic epoxy resin may exhibit a possible risk of skin cancer under conditions of long-term skin contact. The single components however do not have this adverse effect (potentiation).

Species : Mouse, male
 Application Route : Dermal
 Dose : 4000-8000 mg/kg bw
 NOAEL : 4,000 - 8,000
 Method : carcinogenicity study
 Result : negative
 GLP : no

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Phenol, polymer with formaldehyde, glycidyl ether:

Species : Rat, male and female
 Application Route : Oral
 Exposure time : 24 month(s)
 Dose : 15 mg/kg
 Frequency of Treatment : 7 daily
 Method : OECD Test Guideline 453
 Result : negative

Species : Mouse, male
 Application Route : Dermal
 Exposure time : 24 month(s)
 Dose : .1 mg/kg
 Frequency of Treatment : 3 daily
 Method : OECD Test Guideline 453
 Result : negative

Species : Rat, female
 Application Route : Dermal
 Exposure time : 24 month(s)
 Dose : 1 mg/kg
 Frequency of Treatment : 5 daily
 Method : OECD Test Guideline 453
 Result : negative

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

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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

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:****7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

Effects on foetal development : Test Type: Pre-natal
 Species: Rat, female
 Application Route: Oral
 Dose: 5/25/125/500 mg/kg bw/day
 Duration of Single Treatment: 14 d
 General Toxicity Maternal: NOAEL: 25 mg/kg body weight
 Developmental Toxicity: NOAEL: 125 mg/kg body weight
 Method: OECD Test Guideline 414
 Result: No teratogenic effects
 GLP: yes

Phenol, polymer with formaldehyde, glycidyl ether:

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

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Species: Rabbit, female
Application Route: Oral
General Toxicity Maternal: NOAEL: 60 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rat, female
Application Route: Oral
General Toxicity Maternal: NOAEL: 180 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

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

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Method: OECD Test Guideline 414
Result: No teratogenic effects

p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline:

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Application Route: Oral
Dose: 5/15/25 mg/kg bw/d
General Toxicity - Parent: NOEL: 25 mg/kg body weight
General Toxicity F1: NOEL: 25 mg/kg body weight
Method: OECD Test Guideline 416

Effects on foetal development : Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Dose: 0/5/15/40 mg/kg bw/d
Duration of Single Treatment: 15 d
Frequency of Treatment: 7 days/week
General Toxicity Maternal: NOEL: 15 mg/kg body weight
Developmental Toxicity: NOEL: 15 mg/kg body weight
Method: OECD Test Guideline 414

STOT - single exposure

No data available

STOT - repeated exposure**Components:****7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

Exposure routes : Ingestion
Target Organs : Nasal inner lining
Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline:

Exposure routes : Ingestion
Target Organs : Gastrointestinal tract, female reproductive organs
Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

Repeated dose toxicity**Components:****7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

Species : Rat, male and female
NOEL : 5 mg/kg
Application Route : oral (gavage)
Exposure time : 90 d
Dose : 5, 50 and 500 mg/kg/day.
Method : OECD Test Guideline 408
GLP : yes

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Phenol, polymer with formaldehyde, glycidyl ether:

Species : Rat, male and female
NOAEL : 50 mg/kg
Application Route : Ingestion
Exposure time : 14 Weeks
Number of exposures : 7 d
Method : Subchronic toxicity

Species : Rat, male and female
NOEL : 10 mg/kg
Application Route : Skin contact
Exposure time : 13 Weeks
Number of exposures : 5 d
Method : Subchronic toxicity

Species : Mouse, male
NOAEL : 100 mg/kg
Application Route : Skin contact
Exposure time : 13 Weeks
Number of exposures : 3 d
Method : Subchronic toxicity

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

p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline:

Species : Rat, male and female
NOAEL : 15 mg/kg bw/d
Application Route : Oral
Exposure time : 90 d
Number of exposures : one daily
Dose : 1.5, 5 or 15 mg/kg bw/day

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Method : OECD Test Guideline 408
GLP : yes

Species : Rat, male and female
NOAEL : 50 mg/kg bw/day
Application Route : Oral
Exposure time : 28 d
Number of exposures : Once daily
Dose : 0, 50, 150, 450 mg/kg bw/day
Target Organs : Gastrointestinal tract, female reproductive organs, Stomach
Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

Remarks : Information given is based on data obtained from similar substances.

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:****7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 24 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Fresh water
Method: OECD Test Guideline 203
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 32 - 56 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/aquatic plants : ErC50 (Selenastrum capricornutum (green algae)): > 110 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

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NOEC (Selenastrum capricornutum (green algae)): 30 mg/l
 Exposure time: 72 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 201
 GLP: yes

Toxicity to microorganisms : EC50 (activated sludge): 2,000 mg/l
 Exposure time: 3 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 209
 GLP: yes

NOEC (activated sludge): 195 mg/l
 Exposure time: 3 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 209
 GLP: yes

Ecotoxicology Assessment

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

Phenol, polymer with formaldehyde, glycidyl ether:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 1.5 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)): 1.7 mg/l
 Exposure time: 48 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 202

EC50 (Daphnia magna (Water flea)): 2.7 mg/l
 Exposure time: 48 h
 Test Type: static test
 Test substance: Fresh water

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 9.4 mg/l
 Exposure time: 72 h
 Test Type: static test
 Test substance: Fresh water

Toxicity to fish (Chronic toxicity) : GLP: yes

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

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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

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.

p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline:

Toxicity to fish : LC50 (Cyprinus carpio (Carp)): 4.2 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)): 18 mg/l
Exposure time: 48 h
Test Type: static test

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- Test substance: Fresh water
 Method: OECD Test Guideline 202
- Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (algae)): 13 mg/l
 Exposure time: 72 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 201
- NOEC (Pseudokirchneriella subcapitata (green algae)): 0.42 mg/l
 Exposure time: 72 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 201
- M-Factor (Acute aquatic toxicity) : 1
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.42 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.
- M-Factor (Chronic aquatic toxicity) : 1
- Toxicity to microorganisms : EC50 (Pseudomonas putida): > 10 mg/l
 mg
 Exposure time: 16 h
 Test Type: static test
 Test substance: Fresh water
 Method: DIN 38 412 Part 8

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:****7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

- Biodegradability : aerobic
 Inoculum: activated sludge, adapted
 Concentration: 20 mg/l
 Result: Biodegradable, but failing 10-d window
 Biodegradation: 71 %
 Exposure time: 28 d
 Method: OECD Test Guideline 301B
 GLP: yes

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Phenol, polymer with formaldehyde, glycidyl ether:

- Biodegradability : Inoculum: Sewage (STP effluent)
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

2,2'-[(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

p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline:

- Biodegradability : Inoculum: activated sludge
Concentration: 3.2 mg/l
Result: Not readily biodegradable.
Biodegradation: 3.4 %
Exposure time: 29 d
Method: OECD Test Guideline 301B
- Stability in water : Degradation half life (DT50): 4.3 hrs (50 °C) pH: 7
Method: OECD Test Guideline 111
Remarks: Fresh water
- Degradation half life (DT50): 4.1 d (20 °C) pH: 7

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Method: OECD Test Guideline 111

Degradation half life (DT50): 3.9 hrs (50 °C) pH: 4
 Method: OECD Test Guideline 111
 Remarks: Fresh water

Degradation half life (DT50): 10 h (40 °C) pH: 7
 Method: OECD Test Guideline 111

Degradation half life (DT50): 2.2 d (25 °C) pH: 4
 Method: OECD Test Guideline 111
 GLP: No information available.
 Remarks: Fresh water

Degradation half life (DT50): 4.3 h (50 °C) pH: 7
 Method: OECD Test Guideline 111

Degradation half life (DT50): 2.3 d (25 °C) pH: 7
 Method: OECD Test Guideline 111
 Remarks: Fresh water

Degradation half life (DT50): 2.6 d (25 °C) pH: 9
 Method: OECD Test Guideline 111
 Remarks: Fresh water

Degradation half life (DT50): 5.7 hrs (50 °C) pH: 9
 Method: OECD Test Guideline 111
 Remarks: Fresh water

Degradation half life (DT50): 10.8 d (12 °C)
 GLP: yes

Bioaccumulative potential**Components:****7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

Partition coefficient: n- : log Pow: 1.34 (68 °F / 20 °C)
 octanol/water : Method: OECD Test Guideline 107
 GLP: yes

Phenol, polymer with formaldehyde, glycidyl ether:

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

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

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

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

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

p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline:

Partition coefficient: n-octanol/water : log Pow: 0.871 (77 °F / 25 °C)
pH: 7

Mobility in soil**Components:****Phenol, polymer with formaldehyde, glycidyl ether:**

Distribution among environmental compartments : Koc: 445

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

Distribution among environmental compartments : Koc: 445

p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline:

Distribution among environmental compartments : Koc: 84
Method: OECD Test Guideline 121

Other adverse effects**Product:**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82
Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

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

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : Dispose of contents and container in accordance with all local, regional, national and international regulations.
Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

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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 : Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitisation
Germ cell mutagenicity
Specific target organ toxicity (single or repeated exposure)

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

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

California Prop. 65

This product contains a chemical that is at or below California Propositions 65's "safe harbor level" as determined via a risk assessment. Therefore, the chemical is not required to be listed as a Prop 65 chemical on the SDS or label.

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

| | |
|-------|--|
| DSL | : All components of this product are on the Canadian DSL |
| AIIC | : On the inventory, or in compliance with the inventory |
| ENCS | : 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.

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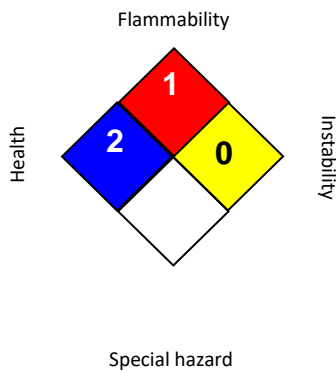
US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

The following substance(s) is/are subject to TSCA 12(b) export notification requirements:
 p-(2,3-epoxypropoxy)-N,N-bis(2,3-epoxypropyl)aniline 5026-74-4

SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:

| | | |
|------------------------|---|----------|
| HEALTH | * | 2 |
| FLAMMABILITY | | 1 |
| PHYSICAL HAZARD | | 0 |

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

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

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.

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SAFETY DATA SHEET



Enriching lives through innovation

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HARDENER 927 US

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SECTION 1. IDENTIFICATION

Product name : HARDENER 927 US

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC
Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)
Telephone : Non-Emergency: (800) 257-5547
E-mail address : Global_Product_EHS_AdMat@huntsman.com
Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Hardener

SECTION 2. HAZARDS IDENTIFICATION**GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)**

Acute toxicity (Oral) : Category 4
Eye irritation : Category 2A
Skin sensitisation : Category 1
Short-term (acute) aquatic hazard : Category 2
Long-term (chronic) aquatic hazard : Category 2

GHS label elements

Hazard pictograms :



Signal word : Warning

Hazard statements : H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**

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P261 Avoid breathing mist or vapours.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P272 Contaminated work clothing must not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.
Response:
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
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.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
P391 Collect spillage.
Storage:
Not available
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) |
|--------------------|----------|-----------------------|
| m-phenylenediamine | 108-45-2 | 50 - 70 |

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.
Treat symptomatically.
Get medical attention if symptoms occur.

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- If inhaled : Consult a physician after significant exposure.
If inhaled, remove to fresh air.
Get medical attention if symptoms occur.
- In case of skin contact : If on skin, rinse well with water.
- 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 : No hazardous combustion products are known
- 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

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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.
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.
Dispose of rinse water in accordance with local and national regulations.

Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep in properly labelled containers.

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

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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 |
|--------------------|----------|----------------------------------|---|-------|
| m-phenylenediamine | 108-45-2 | TWA | 0.1 mg/m ³ | ACGIH |

Personal protective equipment

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines
Recommended Filter type:
Combined particulates and organic vapour type

Filter type : Filter type A-P

Respiratory protection : No personal respiratory protective equipment normally required.

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.

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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 : dark 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

Boiling point : > 392 °F / > 200 °C

Flash point : > 280 °F / > 138 °C
Method: Pensky-Martens closed cup, 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 : 1.1 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.

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Decomposition temperature : > 392 °F / > 200 °C

Self-Accelerating decomposition temperature (SADT) : No data is available on the product itself.

Viscosity
Viscosity, dynamic : ca. 30,000 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 : Burning produces noxious and toxic fumes.
Nitrogen oxides (NOx)
Carbon oxides
No decomposition if stored and applied as directed.

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

Acute oral toxicity : Acute toxicity estimate: 900 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: 6.4 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: 2,200 mg/kg
Method: Calculation method

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Components:**m-phenylenediamine:**

Acute oral toxicity : LD50 (Rat, male): 450 mg/kg
Method: OECD Test Guideline 401

Acute toxicity estimate (Rat, male): 450 mg/kg

Acute inhalation toxicity : LC50 (Rat, male): 3.2 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : see user defined free text (Rabbit, male): 1,500 mg/kg
Method: OECD Test Guideline 402
Assessment: The component/mixture is moderately toxic after single contact with skin.
Remarks: Information given is based on data obtained from similar substances.

Skin corrosion/irritation**Components:****m-phenylenediamine:**

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

Serious eye damage/eye irritation**Components:****m-phenylenediamine:**

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

Respiratory or skin sensitisation**Components:****m-phenylenediamine:**

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

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Germ cell mutagenicity**Components:****m-phenylenediamine:**

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

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse (male and female)
Application Route: Oral
Dose: 16, 33, 65 mg/kg/day
Method: OECD Test Guideline 474
Result: negative
GLP: yes

Germ cell mutagenicity - Assessment : Animal testing did not show any mutagenic effects.

Carcinogenicity

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

No data available

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity**Components:****m-phenylenediamine:**

Species : Rat, male and female
NOAEL : 6 mg/kg
Application Route : oral (gavage)
Exposure time : 90 d
Number of exposures : daily
Dose : 2/6/18 mg/kg bw/day
Method : OECD Test Guideline 408

Aspiration toxicity

No data available

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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:****m-phenylenediamine:**

- Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 512 mg/l
 Exposure time: 96 h
 Test Type: flow-through test
 Test substance: Fresh water
 Method: Fish Acute Toxicity Test
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Gammarus fasciatus (freshwater shrimp)): 7.8 mg/l
 Exposure time: 48 h
 Test Type: flow-through test
 Test substance: Fresh water
 GLP: yes
- Toxicity to algae/aquatic plants : ErC50 (Selenastrum capricornutum (green algae)): 5.63 mg/l
 Exposure time: 96 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 201
- NOEC (Selenastrum capricornutum (green algae)): 0.915 mg/l
 Exposure time: 96 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)): 0.05 mg/l
 Exposure time: 21 d
 Test Type: flow-through test
 Analytical monitoring: yes
 Test substance: Fresh water
 Method: OECD Test Guideline 211
 GLP: yes
- M-Factor (Chronic aquatic toxicity) : 1
- Toxicity to microorganisms : EC50 (activated sludge): 100 mg/l
 Exposure time: 0.5 h
 Test substance: Fresh water

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Method: OECD Test Guideline 209
Remarks: Information given is based on data obtained from similar substances.

Ecotoxicology Assessment

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

Persistence and degradability**Components:****m-phenylenediamine:**

Biodegradability : aerobic
Inoculum: activated sludge
Concentration: 2 mg/l
Result: Not biodegradable
Biodegradation: 30 %
Exposure time: 28 d
Method: OECD Test Guideline 301D
GLP: yes
Remarks: Based on data from similar materials

Photodegradation : Test Type: Water
Method: Indirect Photolysis Screening Test: Sunlight
Photolysis in Waters Containing Dissolved Humic Substances

Bioaccumulative potential**Components:****m-phenylenediamine:**

Partition coefficient: n-octanol/water : log Pow: -0.39 (77 °F / 25 °C)
pH: 7
Method: QSAR
GLP: no

Mobility in soil

No data available

Other adverse effects**Product:**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82
Protection of Stratospheric Ozone - CAA Section 602 Class I
Substances
Remarks: This product neither contains, nor was
manufactured with a Class I or Class II ODS as defined by the
U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A +
B).

Additional ecological information : An environmental hazard cannot be excluded in the event of
unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.
Toxic to aquatic life with long lasting effects.

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SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

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

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

- UN/ID No. : UN 3082
Proper shipping name : Environmentally hazardous substance, liquid, n.o.s.
(PHENYLENEDIAMINES)
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.
(PHENYLENEDIAMINES)
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.
(PHENYLENEDIAMINES)
Class : 9
Packing group : III
Labels : CLASS 9
ERG Code : 171

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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**

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

SARA 311/312 Hazards : Acute toxicity (any route of exposure)
 Respiratory or skin sensitisation
 Serious eye damage or eye irritation

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

m-phenylenediamine 108-45-2 >= 50 - < 70 %

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

California Prop. 65

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

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

DSL : This product contains one or several components listed in the Canadian NDSL.

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

NZIoC : Not in compliance with the inventory

ENCS : Notified. Allowed to be imported / manufactured only by the notifiers. Please contact your Huntsman sales representative for more information.

KECI : Not in compliance with the inventory

PICCS : Not in compliance with the inventory

IECSC : Notified. Allowed to be imported / manufactured only by the notifiers. Please contact your Huntsman sales representative for more information.

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TCSI : Not in compliance with the inventory

TSCA : All substances listed as active on the TSCA inventory

Inventories

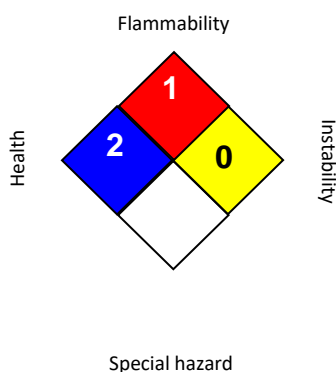
AllC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

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:**

| | | |
|------------------------|--|----------|
| HEALTH | | 2 |
| FLAMMABILITY | | 1 |
| PHYSICAL HAZARD | | 0 |

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

Revision Date : 11/09/2022

ACGIH : USA. ACGIH Threshold Limit Values (TLV)
 ACGIH / 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.

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

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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