

**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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**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 elements**Hazard pictograms : 

Signal word : Warning

Hazard statements : H315 Causes skin irritation.

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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.

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

**SECTION 5. FIREFIGHTING MEASURES**

- Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
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 (CO<sub>2</sub>)  
Carbon monoxide  
Carbon oxides  
Halogenated compounds  
Nitrogen oxides (NO<sub>x</sub>)
- 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.

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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.

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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/cm<sup>3</sup> (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.

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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



**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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)

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

**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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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



**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

**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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

- 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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

**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

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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.



**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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.



**EPOCAST® 35 A US**

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

Print Date 04/20/2023

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.

**EPOCAST® 35 A US**

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

Print Date 04/20/2023

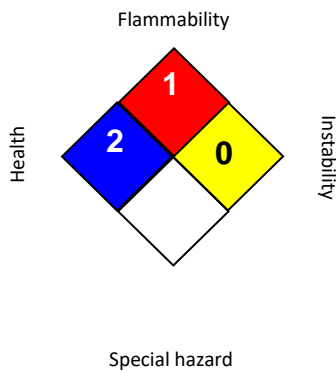
**US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)**

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:**

<b>HEALTH</b>	*	<b>2</b>
<b>FLAMMABILITY</b>		<b>1</b>
<b>PHYSICAL HAZARD</b>		<b>0</b>

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 : 03/28/2023

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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

## EPOCAST® 35 A US

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

Print Date 04/20/2023

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**HARDENER 927 US**

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Print Date 04/20/2023

**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 4980The 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:**

**HARDENER 927 US**

Version 1.1      Revision Date: 11/09/2022      SDS Number: 400001008329      Date of last issue: 06/20/2017  
Date of first issue: 06/20/2017

Print Date 04/20/2023

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.

**HARDENER 927 US**

Version	Revision Date:	SDS Number:	Date of last issue: 06/20/2017
1.1	11/09/2022	400001008329	Date of first issue: 06/20/2017

Print Date 04/20/2023

- 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 (CO<sub>2</sub>)  
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



**HARDENER 927 US**

Version	Revision Date:	SDS Number:	Date of last issue: 06/20/2017
1.1	11/09/2022	400001008329	Date of first issue: 06/20/2017

Print Date 04/20/2023

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.

**HARDENER 927 US**

Version 1.1      Revision Date: 11/09/2022      SDS Number: 400001008329      Date of last issue: 06/20/2017  
 Date of first issue: 06/20/2017

Print Date 04/20/2023

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 <sup>3</sup>	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.

**HARDENER 927 US**

Version 1.1      Revision Date: 11/09/2022      SDS Number: 400001008329      Date of last issue: 06/20/2017  
Date of first issue: 06/20/2017

Print Date 04/20/2023

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/cm<sup>3</sup> (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.

**HARDENER 927 US**

Version 1.1      Revision Date: 11/09/2022      SDS Number: 400001008329      Date of last issue: 06/20/2017  
Date of first issue: 06/20/2017

Print Date 04/20/2023

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

**HARDENER 927 US**

Version 1.1      Revision Date: 11/09/2022      SDS Number: 400001008329      Date of last issue: 06/20/2017  
Date of first issue: 06/20/2017

Print Date 04/20/2023

**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.

**HARDENER 927 US**

Version 1.1      Revision Date: 11/09/2022      SDS Number: 400001008329      Date of last issue: 06/20/2017  
Date of first issue: 06/20/2017

Print Date 04/20/2023

**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

**HARDENER 927 US**

Version	Revision Date:	SDS Number:	Date of last issue: 06/20/2017
1.1	11/09/2022	400001008329	Date of first issue: 06/20/2017

Print Date 04/20/2023

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

**HARDENER 927 US**

Version 1.1      Revision Date: 11/09/2022      SDS Number: 400001008329      Date of last issue: 06/20/2017  
Date of first issue: 06/20/2017

Print Date 04/20/2023

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.



**HARDENER 927 US**

Version 1.1      Revision Date: 11/09/2022      SDS Number: 400001008329      Date of last issue: 06/20/2017  
Date of first issue: 06/20/2017

Print Date 04/20/2023

**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

**HARDENER 927 US**

Version	Revision Date:	SDS Number:	Date of last issue: 06/20/2017
1.1	11/09/2022	400001008329	Date of first issue: 06/20/2017

Print Date 04/20/2023

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.

**HARDENER 927 US**

Version 1.1      Revision Date: 11/09/2022      SDS Number: 400001008329      Date of last issue: 06/20/2017  
 Date of first issue: 06/20/2017

Print Date 04/20/2023

TCSI : Not in compliance with the inventory

TSCA : All substances listed as active on the TSCA inventory

**Inventories**

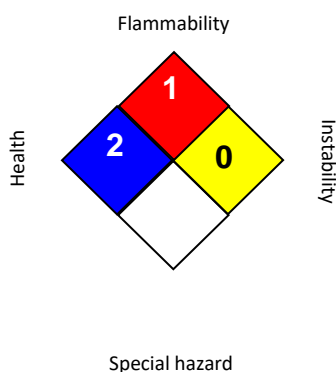
AllC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

**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:**

<b>HEALTH</b>		<b>2</b>
<b>FLAMMABILITY</b>		<b>1</b>
<b>PHYSICAL HAZARD</b>		<b>0</b>

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.

## HARDENER 927 US

Version	Revision Date:	SDS Number:	Date of last issue: 06/20/2017
1.1	11/09/2022	400001008329	Date of first issue: 06/20/2017

Print Date 04/20/2023

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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