ARADUR® HY 1473 BD

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SECTION 1. IDENTIFICATION

Product name : ARADUR® HY 1473 BD

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC
Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)
Telephone : Non-Emergency: (800) 257-5547

E-mail address of person responsible for the SDS : Global_Product_EHS_AdMat@huntsman.com

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

Recommended use of the chemical and restrictions on use

Recommended use : Component used for the manufacture of electrical insulation parts

Restrictions on use : For industrial use only.

SECTION 2. HAZARDS IDENTIFICATION

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

Skin corrosion : Category 1A

Serious eye damage : Category 1

Skin sensitisation : Category 1

Germ cell mutagenicity : Category 2

Specific target organ toxicity - repeated exposure : Category 2 (Central nervous system)

Short-term (acute) aquatic hazard : Category 3

Chronic aquatic toxicity : Category 2

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H341 Suspected of causing genetic defects.
H373 May cause damage to organs (Central nervous system) through prolonged or repeated exposure.
H402 Harmful to aquatic life.
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:
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
P391 Collect spillage.
Storage:
P405 Store locked up.
Disposal:
P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and tetraethylenepentamine	68513-05-3	50 - 70
2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine	25513-64-8	20 - 30
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	10 - 20
phenol	108-95-2	5 - 10
Amines, polyethylenepoly-, tetraethylenepentamine fraction	112-57-2	5 - 10

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 : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Clean mouth with water and drink afterwards plenty of water.
Keep respiratory tract clear.
Do NOT induce vomiting.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

Most important symptoms and effects, both acute and delayed : None known.

Protection of first-aiders : First Aid responders should pay attention to self-protection

and use the recommended protective clothing
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Avoid inhalation, ingestion and contact with skin and eyes.
No action shall be taken involving any personal risk or without suitable training.
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Notes to physician : Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire

Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : Carbon dioxide (CO2)
Carbon monoxide
Carbon oxides
Halogenated compounds
Ammonia
Nitrogen oxides (NOx)

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 : Neutralise with acid.
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product. Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. To avoid spills during handling keep bottle on a metal tray. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Keep in properly labelled containers.
Materials to avoid	:	Do not store near acids.
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
phenol	108-95-2	TWA	5 ppm	ACGIH
		TWA	5 ppm 19 mg/m3	OSHA Z-1
		TWA	5 ppm 19 mg/m3	NIOSH REL
		C	15.6 ppm 60 mg/m3	NIOSH REL
		TWA	5 ppm 19 mg/m3	OSHA P0

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
phenol	108-95-2	Phenol	Urine	End of shift (As	250 mg/g Creatinine	ACGIH BEI

				soon as possible after exposure ceases)		

Personal protective equipment

Respiratory protection	:	General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.
Hand protection		
Remarks	:	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Eye protection	:	Eye wash bottle with pure water Tightly fitting safety goggles Wear face-shield and protective suit for abnormal processing problems.
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	light brown
Odour	:	ammoniacal
Odour Threshold	:	No data is available on the product itself.
pH	:	ca. 11 (68 °F / 20 °C) Concentration: 500 g/l
Melting point/freezing point	:	No data is available on the product itself.
Boiling point	:	> 392 °F / > 200 °C
Flash point	:	241 - 252 °F / 116 - 122 °C Method: Pensky-Martens closed cup
Evaporation rate	:	No data is available on the product itself.

Flammability (solid, gas)	:	No data is available on the product itself.
Flammability (liquids)	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Vapour pressure	:	< 0.4 hPa (68 °F / 20 °C)
Relative vapour density	:	No data is available on the product itself.
Relative density	:	0.98 (77 °F / 25 °C)
Density	:	0.98 g/cm3 (77 °F / 25 °C)
Solubility(ies)		
Water solubility	:	completely miscible (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	:	1,000 - 1,400 mPa.s (68 °F / 20 °C)
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Particle size	:	No data is available on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No hazards to be specially mentioned.
Conditions to avoid	:	None known.
Incompatible materials	:	Strong acids Strong bases Strong oxidizing agents
Hazardous decomposition	:	carbon dioxide

products	carbon monoxide Halogenated compounds Nitrogen oxides (NOx) ammonia, anhydrous Aldehydes Ketones

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : No data is available on the product itself.

Acute toxicity

Acute oral toxicity - Product : Acute toxicity estimate : 2,456 mg/kg
Method: Calculation method

Components:

phenol:
Acute inhalation toxicity : LC50 (Rat, female): > 900 mg/m3
Exposure time: 8 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

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

Acute toxicity (other routes of administration) : No data available

Skin corrosion/irritation

Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and tetraethylenepentamine:
Result: Skin irritation

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Species: Rabbit
Result: Corrosive after 3 minutes or less of exposure

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.

phenol:
Species: Rabbit
Method: OECD Test Guideline 404

Result: Causes burns.

Amines, polyethylenepoly-, tetraethylenepentamine fraction:
Species: Rabbit
Method: OECD Test Guideline 404
Result: Corrosive after 3 minutes to 1 hour of exposure

Serious eye damage/eye irritation

Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and tetraethylenepentamine:
Result: Corrosive

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Species: Rabbit
Result: Corrosive
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

phenol:
Species: Rabbit
Result: Risk of serious damage to eyes.
Method: OECD Test Guideline 405

Amines, polyethylenepoly-, tetraethylenepentamine fraction:
Species: Rabbit
Result: Risk of serious damage to eyes.
Method: OECD Test Guideline 405

Respiratory or skin sensitisation

Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and tetraethylenepentamine:
Result: The product is a skin sensitiser, sub-category 1A.

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: The product is a skin sensitiser, sub-category 1A.

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.

phenol:

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

Amines, polyethylenepoly-, tetraethylenepentamine fraction:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: May cause sensitisation by skin contact.

Assessment: No data available

Germ cell mutagenicity

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium
Concentration: 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: Directive 67/548/EEC, Annex, B.13/14
Result: negative

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

Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster ovary cells
Concentration: 2 mg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
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

Amines, polyethylenepoly-, tetraethylenepentamine fraction:
Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 479
Result: positive

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471
Result: positive

Metabolic activation: negative
Method: OECD Test Guideline 482
Result: negative

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Genotoxicity in vivo : Species: Chinese hamster (male and female)
Cell type: Bone marrow
Application Route: Oral
Dose: 825 - 1000 mg/kg
Method: OECD Test Guideline 474
Result: negative

Test Type: In vivo micronucleus test
Species: Mouse (male and female)
Application Route: Oral
Dose: 850 - 1000 mg/kg
Method: OECD Test Guideline 474
Result: negative

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Genotoxicity in vivo : Test Type: in vivo assay
Species: Mouse (male)
Cell type: Germ
Application Route: Oral
Dose: 3333, 10000 mg/kg
Result: negative

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

Amines, polyethylenepoly-, tetraethylenepentamine fraction:
Genotoxicity in vivo : Application Route: Intraperitoneal injection
Method: OECD Test Guideline 474
Result: negative

Components:

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

Carcinogenicity

Components:

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

Application Route: Oral
Exposure time: 24 month(s)
Dose: 0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment: 7 days/week
NOAEL: 15 mg/kg bw/day

Method: OECD Test Guideline 453
Result: negative
Target Organs: Digestive organs

Species: Mouse, male
Application Route: Dermal
Exposure time: 24 month(s)
Dose: 0, 0.1, 10, 100 mg/kg bw/day
Frequency of Treatment: 3 days/week
NOEL: 0.1 mg/kg body weight

Method: OECD Test Guideline 453
Result: negative
Target Organs: Digestive organs

Species: Rat, female
Application Route: Dermal
Exposure time: 24 month(s)
Dose: 0.1, 100, 1000 mg/kg bw/day
Frequency of Treatment: 5 days/week
NOEL: 100 mg/kg body weight

Method: OECD Test Guideline 453
Result: negative

Species: Rat, female
Application Route: Oral
Exposure time: 24 month(s)
Dose: 0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment: 7 days/week
NOAEL: 100 mg/kg bw/day

Method: OECD Test Guideline 453
Result: negative
Target Organs: Digestive organs

Species: Rat, females
Application Route: Oral
Exposure time: 24 month(s)
Dose: 0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment: 7 days/week
NOEL: 2 mg/kg bw/day

Method: OECD Test Guideline 453
Result: negative
Target Organs: Digestive organs

phenol:
Species: Mouse, male and female
Application Route: Oral

Exposure time: 103 weeks
Dose: 5000 ppm
Method: OECD Test Guideline 451
Result: negative

Amines, polyethylenepoly-, tetraethylenepentamine fraction:
Species: Mouse, male
Application Route: Dermal
Exposure time: 627 days
Dose: >= 42 mg/kg
Frequency of Treatment: 3 daily
Method: OECD Test Guideline 451
Result: negative

Carcinogenicity - Assessment : No data available

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.

ACGIH No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

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:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Effects on fertility : Species: Rat, male and female
Application Route: Oral
Dose: 10, 60, 120 mg/kg bw/day
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
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: No-observed-effect level: 540 mg/kg body weight
General Toxicity F1: No-observed-effect level: 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.

phenol:

Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 416
Remarks: No significant adverse effects were reported

Species: Mouse, female
Application Route: Oral

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Effects on foetal development : Species: Rabbit, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 50,000 ppm
Result: No teratogenic effects

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

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: No observed adverse effect level: 30 mg/kg body weight
Developmental Toxicity: No observed adverse effect level: 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: No observed adverse effect level: 60 mg/kg body weight
Developmental Toxicity: No observed adverse effect level: 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: No observed adverse effect level: 180 mg/kg body weight
Developmental Toxicity: No observed adverse effect level: > 540 mg/kg body weight

Method: OECD Test Guideline 414
Result: No teratogenic effects

phenol:

Species: Rat, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 60 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Amines, polyethylenepoly-, tetraethylenepentamine fraction:

Species: Rabbit, female
Application Route: Dermal
General Toxicity Maternal: No-observed-effect level: 50 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rat, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 750 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Reproductive toxicity - Assessment : No data available

STOT - single exposure

Components:

phenol:
Exposure routes: Inhalation
Target Organs: Narcotic effects
Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects.

STOT - repeated exposure

Components:

phenol:
Target Organs: Central nervous system
Assessment: May cause damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Species: Rat, male and female
NOAEL: 10 mg/kg bw/day
Application Route: Ingestion
Exposure time: 13 Weeks
Number of exposures: Daily

Dose: 10, 60, 180mg/kg bw
Target Organs: Liver

Species: Rat, male and female
LOAEL: 60 mg/kg bw/day
Application Route: Ingestion
Exposure time: 13 Weeks
Number of exposures: Daily
Dose: 10, 60, 180mg/kg bw
Target Organs: Liver

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

phenol**:**
Species: Monkey, male
NOEC: 1.8 mg/kg, > 19.6 mg/m3
Application Route: Ingestion
Test atmosphere: dust/mist
Exposure time: 672 h
Number of exposures: 8 h
Method: Subacute toxicity

Species: Rabbit
LOEL: 260 mg/kg
Application Route: Skin contact
Exposure time: 432 h
Method: Subacute toxicity

Species: Rat, male and female
NOAEL: 450 mg/kg
Application Route: Ingestion

Exposure time: 103 Weeks
Number of exposures: 7 d
Method: Chronic toxicity

Amines, polyethylenepoly-, tetraethylenepentamine fraction:
Species: Rat, male and female
NOAEL: 50 mg/kg/d
Application Route: Ingestion
Exposure time: 4,368 h
Method: Subchronic toxicity

Species: Rabbit, male and female
NOAEL: 50 mg/kg/d
Application Route: Skin contact
Exposure time: 744 h
Number of exposures: 5 d
Method: Subacute toxicity

Repeated dose toxicity - Assessment : No data available

Aspiration toxicity
No data available

Experience with human exposure
General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

Toxicology, Metabolism, Distribution
No data available

Neurological effects
No data available

Further information
Ingestion: No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 174 mg/l
Exposure time: 48 h
Method: DIN 38412

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

phenol:
Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 8.9 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Fresh water

Amines, polyethylenepoly-, tetraethylenepentamine fraction:
Toxicity to fish : LC50 (Poecilia reticulata (guppy)): 420 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.1.

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 31.5 mg/l
Exposure time: 24 h
Method: DIN 38412

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

phenol:
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 3.1 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: Aquatic Invertebrate Acute Toxicity Test, Freshwater Daphnids

Amines, polyethylenepoly-, tetraethylenepentamine fraction:
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 24.1 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: Tested according to Annex V of Directive

67/548/EEC.

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (algae)): 43.5 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

EC50 (Pseudokirchneriella subcapitata (algae)): 37.1 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (algae)): 16 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

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

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

Amines, polyethylenepoly-, tetraethylenepentamine fraction:

Toxicity to algae/aquatic plants : ErC50 (Selenastrum capricornutum (green algae)): 6.8 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity) : No data available

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Toxicity to fish (Chronic toxicity) : NOEC (Brachydanio rerio (zebrafish)): 10.9 mg/l
Exposure time: 30 d
Method: OECD Test Guideline 210

Lowest Observed Effect Concentration (Brachydanio rerio (zebrafish)): 10.9 mg/l
Exposure time: 30 d
Method: OECD Test Guideline 210

phenol:

Toxicity to fish (Chronic toxicity) : NOEC (Other): 0.077 mg/l
Exposure time: 60 d
Test Type: semi-static test
Test substance: Fresh water

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 1.02 mg/l Exposure time: 21 d Method: OECD Test Guideline 211
		Lowest Observed Effect Concentration (Daphnia magna (Water flea)): 1.02 mg/l Exposure time: 21 d Method: OECD Test Guideline 211

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

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

phenol:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	EC10 (Daphnia magna (Water flea)): 4.6 mg/l Exposure time: 16 d Test Type: semi-static test Test substance: Fresh water
M-Factor (Chronic aquatic toxicity)	:	No data available

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Toxicity to microorganisms	:	IC50 (Pseudomonas putida): 89 mg/l Exposure time: 17 h

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

Toxicity to microorganisms	:	IC50 (activated sludge): > 100 mg/l Exposure time: 3 h Test Type: static test Test substance: Fresh water

Amines, polyethylenepoly-, tetraethylenepentamine fraction:

Toxicity to microorganisms	:	EC50: 97.3 mg/l Exposure time: 2 h Test Type: static test Test substance: Fresh water

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

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

Plant toxicity : No data available

Sediment toxicity : No data available

Toxicity to terrestrial organisms : No data available

Ecotoxicology Assessment
Acute aquatic toxicity : No data available

Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and tetraethylenepentamine:
Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

Persistence and degradability

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Biodegradability : Inoculum: activated sludge
Concentration: 11.4 mg/l
Result: Not readily biodegradable.
Biodegradation: 7 %
Exposure time: 28 d

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

phenol:
Biodegradability : Inoculum: activated sludge
Concentration: 30 mg/l
Result: Readily biodegradable.
Biodegradation: 62 %
Exposure time: 4.16667 d
Method: OECD Test Guideline 301C

Amines, polyethylenepoly-, tetraethylenepentamine fraction:
Biodegradability : Inoculum: activated sludge
Result: Not biodegradable
Biodegradation: 17 %

Exposure time: 84 d
Method: Inherent Biodegradability: Modified SCAS Test

Biochemical Oxygen Demand (BOD) : No data available

Chemical Oxygen Demand (COD) : No data available

BOD/COD : No data available

ThOD : No data available

BOD/ThOD : No data available

Dissolved organic carbon (DOC) : No data available

Physico-chemical removability : No data available

Components:

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

Stability in water : Degradation half life(DT50): 4.83 d (77 °F / 25 °C) pH: 4
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life(DT50): 7.1 d (77 °F / 25 °C) pH: 9
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life(DT50): 3.58 d (77 °F / 25 °C) pH: 7
Method: OECD Test Guideline 111
Remarks: Fresh water

Photodegradation : No data available

Impact on Sewage Treatment : No data available

Bioaccumulative potential

Components:

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

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

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Partition coefficient: n-octanol/water : log Pow: -0.3 (77 °F / 25 °C)
Method: OECD Test Guideline 117

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

Partition coefficient: n- : log Pow: 3.242 (77 °F / 25 °C)

octanol/water		pH: 7.1 Method: OECD Test Guideline 117

phenol:

Partition coefficient: n-octanol/water	:	log Pow: 1.47 (86 °F / 30 °C) pH: 3.8

Amines, polyethylenepoly-, tetraethylenepentamine fraction:

Partition coefficient: n-octanol/water	:	log Pow: -3.16

Mobility in soil

Mobility	:	No data available

Components:

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

Distribution among environmental compartments	:	Koc: 445

Amines, polyethylenepoly-, tetraethylenepentamine fraction:

Distribution among environmental compartments	:	Koc: 3.2 - 3.7 Method: OECD Test Guideline 106
Stability in soil	:	No data available

Other adverse effects

Environmental fate and pathways	:	No data available
Results of PBT and vPvB assessment	:	No data available
Endocrine disrupting potential	:	No data available
Adsorbed organic bound halogens (AOX)	:	No data available

Hazardous to the ozone layer

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 - Product	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life. Toxic to aquatic life with long lasting effects.
Global warming potential (GWP)	:	No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

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

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA

UN/ID No.	:	UN 1760
Proper shipping name	:	Corrosive liquid, n.o.s.
Class	:	8
Packing group	:	III
Labels	:	Corrosive
Packing instruction (cargo aircraft)	:	856
Packing instruction (passenger aircraft)	:	852

IMDG

UN number	:	UN 1760
Proper shipping name	:	CORROSIVE LIQUID, N.O.S.
Class	:	8
Packing group	:	III
Labels	:	8
EmS Code	:	F-A, S-B
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

DOT Classification

UN/ID/NA number	:	UN 1760
Proper shipping name	:	CORROSIVE LIQUIDS, N.O.S.
Class	:	8

Packing group	:	III
Labels	:	CORROSIVE
ERG Code	:	154
Marine pollutant	:	yes

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
phenol	108-95-2	1000	16996

SARA 311/312 Hazards : Respiratory or skin sensitisation
Germ cell mutagenicity
Specific target organ toxicity (single or repeated exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation

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

phenol 108-95-2 >= 5 - < 10 %

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 112 (40 CFR 61):

phenol 108-95-2

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	:	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), TSCA (USA)

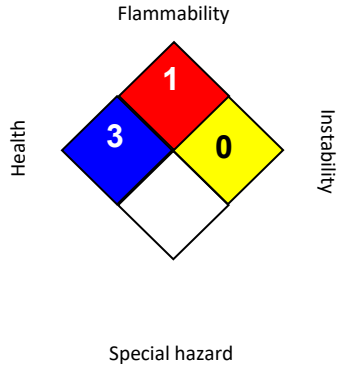
TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No substances are subject to TSCA 12(b) export notification requirements.

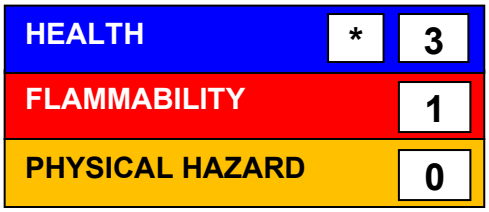
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



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

Revision Date	:	04/12/2021
ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	:	ACGIH - Biological Exposure Indices (BEI)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / C	:	Ceiling value not be exceeded at any time.
OSHA P0 / TWA	:	8-hour time weighted average
OSHA Z-1 / TWA	:	8-hour time weighted average

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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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