



# Epoxy 450 Part B

## ICP Building Solutions Group

Version No: 5.5  
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Issue Date: **03/03/2021**  
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S.GHS.USA.EN

### SECTION 1 Identification

#### Product Identifier

Product name	Epoxy 450 Part B
Synonyms	Not Available
Proper shipping name	Amines, liquid, corrosive, n.o.s.(contains 1,3-cyclohexanebis(methylamine))
Other means of identification	Not Available

#### Recommended use of the chemical and restrictions on use

Relevant identified uses	Specialty Flooring Curative
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#### Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	ICP Building Solutions Group
Address	4565 W Watkins Street Phoenix AZ United States
Telephone	623-435-2277
Fax	Not Available
Website	<a href="http://www.icpgroup.com">www.icpgroup.com</a>
Email	sds@icpgroup.com

#### Emergency phone number

Association / Organisation	ChemTel
Emergency telephone numbers	1-800-255-3924
Other emergency telephone numbers	1-813-248-0585

### SECTION 2 Hazard(s) identification

#### Classification of the substance or mixture

NFPA 704 diamond



Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

Classification	Chronic Aquatic Hazard Category 2, Acute Toxicity (Dermal) Category 4, Corrosive to Metals Category 1, Serious Eye Damage/Eye Irritation Category 1, Acute Toxicity (Oral) Category 4, Reproductive Toxicity Category 1, Skin Sensitizer Category 1, Germ cell mutagenicity Category 2, Specific target organ toxicity - repeated exposure Category 1, Skin Corrosion/Irritation Category 1A, Carcinogenicity Category 2, Acute Aquatic Hazard Category 2
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#### Label elements

Hazard pictogram(s)	
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Signal word	<b>Danger</b>
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#### Hazard statement(s)

H411	Toxic to aquatic life with long lasting effects.
H312	Harmful in contact with skin.

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H290	May be corrosive to metals.
H302	Harmful if swallowed.
H361	Suspected of damaging fertility or the unborn child.
H317	May cause an allergic skin reaction.
H341	Suspected of causing genetic defects.
H372	Causes damage to organs through prolonged or repeated exposure.
H314	Causes severe skin burns and eye damage.
H351	Suspected of causing cancer.

**Hazard(s) not otherwise classified**

Not Applicable

**Precautionary statement(s) General**

P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.

**Precautionary statement(s) Prevention**

P202	Do not handle until all safety precautions have been read and understood.
P264	Wash thoroughly after handling.
P260	Do not breathe mist/vapours/spray.
P270	Do not eat, drink, or smoke while using this product.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

**Precautionary statement(s) Response**

P303+P313	If exposed or concerned, get medical advice/attention.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P3501+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P337+P313	IF eye irritation persists, seek medical advice/attention.
P362+P364	Take off contaminated clothing and wash before reuse.

**Precautionary statement(s) Storage**

P405	Store locked up.
P403+P235	Store in a well-ventilated place. Keep cool.

**Precautionary statement(s) Disposal**

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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**SECTION 3 Composition / information on ingredients****Substances**

See section below for composition of Mixtures

**Mixtures**

CAS No	%[weight]	Name
1761-71-3	1-10	<u>4,4'-methylenebis(cyclohexylamine)</u>
2579-20-6	15-25	<u>1,3-cyclohexanebis(methylamine)</u>
100-51-6	5-20	<u>benzyl alcohol</u>
128-37-0	.1-3	<u>2,6-di-tert-butyl-4-methylphenol</u>
25154-52-3	10-25	<u>nonylphenol</u>
108-95-2	<1	<u>phenol</u>
9046-10-0	20-30	<u>bis(2-aminopropyl ether) propoxylated</u>

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

**SECTION 4 First-aid measures****Description of first aid measures**

<b>Eye Contact</b>	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>▶ Immediately hold eyelids apart and flush the eye continuously with running water.</li> <li>▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> </ul>
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	<ul style="list-style-type: none"> <li>▶ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.</li> <li>▶ Transport to hospital or doctor without delay.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul> <p>For amines:</p> <ul style="list-style-type: none"> <li>▶ If liquid amines come in contact with the eyes, irrigate immediately and continuously with low pressure flowing water, preferably from an eye wash fountain, for 15 to 30 minutes.</li> <li>▶ For more effective flushing of the eyes, use the fingers to spread apart and hold open the eyelids. The eyes should then be "rolled" or moved in all directions.</li> <li>▶ Seek immediate medical attention, preferably from an ophthalmologist.</li> </ul>
<b>Skin Contact</b>	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Immediately flush body and clothes with large amounts of water, using safety shower if available.</li> <li>▶ Quickly remove all contaminated clothing, including footwear.</li> <li>▶ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.</li> <li>▶ Transport to hospital, or doctor.</li> </ul> <p>For amines:</p> <ul style="list-style-type: none"> <li>▶ In case of major exposure to liquid amine, promptly remove any contaminated clothing, including rings, watches, and shoe, preferably under a safety shower.</li> <li>▶ Wash skin for 15 to 30 minutes with plenty of water and soap. Call a physician immediately.</li> <li>▶ Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering.</li> <li>▶ Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.</li> <li>▶ Discard contaminated leather articles such as shoes, belts, and watchbands.</li> <li>▶ Note to Physician: Treat any skin burns as thermal burns. After decontamination, consider the use of cold packs and topical antibiotics.</li> </ul>
<b>Inhalation</b>	<ul style="list-style-type: none"> <li>▶ If fumes or combustion products are inhaled remove from contaminated area.</li> <li>▶ Lay patient down. Keep warm and rested.</li> <li>▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.</li> <li>▶ Transport to hospital, or doctor, without delay.</li> </ul> <p>For amines:</p> <ul style="list-style-type: none"> <li>▶ All employees working in areas where contact with amine catalysts is possible should be thoroughly trained in the administration of appropriate first aid procedures.</li> <li>▶ Experience has demonstrated that prompt administration of such aid can minimize the effects of accidental exposure.</li> <li>▶ Promptly move the affected person away from the contaminated area to an area of fresh air.</li> <li>▶ Keep the affected person calm and warm, but not hot.</li> <li>▶ If breathing is difficult, oxygen may be administered by a qualified person.</li> <li>▶ If breathing stops, give artificial respiration. Call a physician at once.</li> </ul>
<b>Ingestion</b>	<ul style="list-style-type: none"> <li>▶ For advice, contact a Poisons Information Centre or a doctor at once.</li> <li>▶ Urgent hospital treatment is likely to be needed.</li> <li>▶ <b>If swallowed do NOT induce vomiting.</b></li> <li>▶ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</li> <li>▶ Observe the patient carefully.</li> <li>▶ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.</li> <li>▶ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.</li> <li>▶ Transport to hospital or doctor without delay.</li> </ul> <p>For amines:</p> <ul style="list-style-type: none"> <li>▶ If liquid amine are ingested, have the affected person drink several glasses of water or milk.</li> <li>▶ Do not induce vomiting.</li> <li>▶ Immediately transport to a medical facility and inform medical personnel about the nature of the exposure. The decision of whether to induce vomiting should be made by an attending physician.</li> </ul>

**Most important symptoms and effects, both acute and delayed**

See Section 11

**Indication of any immediate medical attention and special treatment needed**

Clinical experience of benzyl alcohol poisoning is generally confined to premature neonates in receipt of preserved intravenous salines.

- ▶ Metabolic acidosis, bradycardia, skin breakdown, hypotonia, hepatorenal failure, hypotension and cardiovascular collapse are characteristic.
- ▶ High urine benzoate and hippuric acid as well as elevated serum benzoic acid levels are found.
- ▶ The so-called "gaspings syndrome" describes the progressive neurological deterioration of poisoned neonates.
- ▶ Management is essentially supportive.

For acute or short term repeated exposures to phenols/ cresols:

- ▶ Phenol is absorbed rapidly through lungs and skin. [Massive skin contact may result in collapse and death]\*
- ▶ [Ingestion may result in ulceration of upper respiratory tract; perforation of oesophagus and/or stomach, with attendant complications, may occur. Oesophageal stricture may occur.]\*
- ▶ An initial excitatory phase may present. Convulsions may appear as long as 18 hours after ingestion. Hypotension and ventricular tachycardia that require vasopressor and antiarrhythmic therapy, respectively, can occur.
- ▶ Respiratory arrest, ventricular dysrhythmias, seizures and metabolic acidosis may complicate severe phenol exposures so the initial attention should be directed towards stabilisation of breathing and circulation with ventilation, intubation, intravenous lines, fluids and cardiac monitoring as indicated.
- ▶ [Vegetable oils retard absorption; do NOT use paraffin oils or alcohols. Gastric lavage, with endotracheal intubation, should be repeated until phenol odour is no longer detectable; follow with vegetable oil. A saline cathartic should then be given.]\* ALTERNATIVELY: Activated charcoal (1g/kg) may be given. A cathartic should be given after oral activated charcoal.
- ▶ Severe poisoning may require slow intravenous injection of methylene blue to treat methaemoglobinemia.
- ▶ [Renal failure may require haemodialysis.]\*
- ▶ Most absorbed phenol is biotransformed by the liver to ethereal and glucuronide sulfates and is eliminated almost completely after 24 hours. [Ellenhorn and Barceloux: Medical Toxicology] \*[Union Carbide]

**BIOLOGICAL EXPOSURE INDEX - BEI**

These represent the determinants observed in specimens collected from a healthy worker who has been exposed to the Exposure Standard (ES or TLV):

Determinant	Index	Sampling Time	Comments
1. Total phenol in blood	250 mg/gm creatinine	End of shift	B, NS

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B: Background levels occur in specimens collected from subjects **NOT** exposed

NS: Non-specific determinant; also seen in exposure to other materials

For acute or short-term repeated exposures to highly alkaline materials:

- Respiratory stress is uncommon but present occasionally because of soft tissue edema.
- Unless endotracheal intubation can be accomplished under direct vision, cricothyroidotomy or tracheotomy may be necessary.
- Oxygen is given as indicated.
- The presence of shock suggests perforation and mandates an intravenous line and fluid administration.
- Damage due to alkaline corrosives occurs by liquefaction necrosis whereby the saponification of fats and solubilisation of proteins allow deep penetration into the tissue.

Alkalis continue to cause damage after exposure.

INGESTION:

- Milk and water are the preferred diluents

No more than 2 glasses of water should be given to an adult.

- Neutralising agents should never be given since exothermic heat reaction may compound injury.

\* Catharsis and emesis are absolutely contra-indicated.

\* Activated charcoal does not absorb alkali.

\* Gastric lavage should not be used.

Supportive care involves the following:

- Withhold oral feedings initially.
- If endoscopy confirms transmucosal injury start steroids only within the first 48 hours.
- Carefully evaluate the amount of tissue necrosis before assessing the need for surgical intervention.
- Patients should be instructed to seek medical attention whenever they develop difficulty in swallowing (dysphagia).

SKIN AND EYE:

- Injury should be irrigated for 20-30 minutes.

Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology]

For amines:

- Certain amines may cause injury to the respiratory tract and lungs if aspirated. Also, such products may cause tissue destruction leading to stricture. If lavage is performed, endotracheal and/or esophagoscopy control is suggested.
- No specific antidote is known.
- Care should be supportive and treatment based on the judgment of the physician in response to the reaction of the patient.

Laboratory animal studies have shown that a few amines are suspected of causing depletion of certain white blood cells and their precursors in lymphoid tissue. These effects may be due to an immunosuppressive mechanism.

Some persons with hyperreactive airways (e.g., asthmatic persons) may experience wheezing attacks (bronchospasm) when exposed to airway irritants.

Lung injury may result following a single massive overexposure to high vapour concentrations or multiple exposures to lower concentrations of any pulmonary irritant material.

Health effects of amines, such as skin irritation and transient corneal edema ("blue haze," "halo effect," "glauropsia"), are best prevented by means of formal worker education, industrial hygiene monitoring, and exposure control methods. Persons who are highly sensitive to the triggering effect of non-specific irritants should not be assigned to jobs in which such agents are used, handled, or manufactured.

**Medical surveillance programs** should consist of a pre-placement evaluation to determine if workers or applicants have any impairments (e.g., hyperreactive airways or bronchial asthma) that would limit their fitness for work in jobs with potential for exposure to amines. A clinical baseline can be established at the time of this evaluation.

Periodic medical evaluations can have significant value in the early detection of disease and in providing an opportunity for health counseling.

Medical personnel conducting medical surveillance of individuals potentially exposed to polyurethane amine catalysts should consider the following:

- Health history, with emphasis on the respiratory system and history of infections
- Physical examination, with emphasis on the respiratory system and the lymphoreticular organs (lymph nodes, spleen, etc.)
- Lung function tests, pre- and post-bronchodilator if indicated
- Total and differential white blood cell count
- Serum protein electrophoresis

Persons who are concurrently exposed to isocyanates also should be kept under medical surveillance.

Pre-existing medical conditions generally aggravated by exposure include skin disorders and allergies, chronic respiratory disease (e.g. bronchitis, asthma, emphysema), liver disorders, kidney disease, and eye disease.

Broadly speaking, exposure to amines, as characterised by amine catalysts, may cause effects similar to those caused by exposure to ammonia. As such, amines should be considered potentially injurious to any tissue that is directly contacted.

Inhalation of aerosol mists or vapors, especially of heated product, can result in chemical pneumonitis, pulmonary edema, laryngeal edema, and delayed scarring of the airway or other affected organs. There is no specific treatment.

Clinical management is based upon supportive treatment, similar to that for thermal burns.

Persons with major skin contact should be maintained under medical observation for at least 24 hours due to the possibility of delayed reactions.

**Polyurethane Amine Catalysts: Guidelines for Safe Handling and Disposal Technical Bulletin June 2000**

**Alliance for Polyurethanes Industry**

## SECTION 5 Fire-fighting measures

### Extinguishing media

- Foam.
- Dry chemical powder.

### Special hazards arising from the substrate or mixture

<b>Fire Incompatibility</b>	▸ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result
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### Special protective equipment and precautions for fire-fighters

<b>Fire Fighting</b>	<ul style="list-style-type: none"> <li>▸ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▸ Wear full body protective clothing with breathing apparatus.</li> </ul> <p>For amines:</p> <ul style="list-style-type: none"> <li>▸ For firefighting, cleaning up large spills, and other emergency operations, workers must wear a self-contained breathing apparatus with full face-piece, operated in a pressure-demand mode.</li> <li>▸ Airline and air purifying respirators should not be worn for firefighting or other emergency or upset conditions.</li> </ul>
<b>Fire/Explosion Hazard</b>	<ul style="list-style-type: none"> <li>▸ Combustible.</li> <li>▸ Slight fire hazard when exposed to heat or flame.</li> </ul> <p>Combustion products include: carbon dioxide (CO<sub>2</sub>) aldehydes nitrogen oxides (NO<sub>x</sub>) other pyrolysis products typical of burning organic material.</p>

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May emit poisonous fumes.  
**WARNING:** Long standing in contact with air and light may result in the formation of potentially explosive peroxides.

## SECTION 6 Accidental release measures

## Personal precautions, protective equipment and emergency procedures

See section 8

## Environmental precautions

See section 12

## Methods and material for containment and cleaning up

<b>Minor Spills</b>	<p>Environmental hazard - contain spillage.</p> <ul style="list-style-type: none"> <li>▶ Remove all ignition sources.</li> <li>▶ Clean up all spills immediately.</li> </ul> <p>for amines:</p> <ul style="list-style-type: none"> <li>▶ If possible (i.e., without risk of contact or exposure), stop the leak.</li> <li>▶ Contain the spilled material by diking, then neutralize.</li> </ul>
<b>Major Spills</b>	<p>Environmental hazard - contain spillage.</p> <ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> </ul> <p>For amines:</p> <ul style="list-style-type: none"> <li>▶ First remove all ignition sources from the spill area.</li> <li>▶ Have firefighting equipment nearby, and have firefighting personnel fully trained in the proper use of the equipment and in the procedures used in fighting a chemical fire.</li> </ul>

Personal Protective Equipment advice is contained in Section 8 of the SDS.

## SECTION 7 Handling and storage

## Precautions for safe handling

<b>Safe handling</b>	<ul style="list-style-type: none"> <li>▶ Avoid all personal contact, including inhalation.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ <b>DO NOT allow clothing wet with material to stay in contact with skin</b></li> </ul>
<b>Other information</b>	<ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> </ul>

## Conditions for safe storage, including any incompatibilities

<b>Suitable container</b>	<ul style="list-style-type: none"> <li>▶ Lined metal can, lined metal pail/ can.</li> <li>▶ Plastic pail.</li> </ul> <p>For low viscosity materials</p> <ul style="list-style-type: none"> <li>▶ Drums and jerricans must be of the non-removable head type.</li> <li>▶ Where a can is to be used as an inner package, the can must have a screwed enclosure.</li> </ul> <p>All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.</p>
<b>Storage incompatibility</b>	<p>Benzyl alcohol:</p> <ul style="list-style-type: none"> <li>▶ may froth in contact with water</li> <li>▶ slowly oxidises in air, oxygen forming benzaldehyde</li> <li>▶ is incompatible with mineral acids, caustics, aliphatic amines, isocyanates</li> <li>▶ reacts violently with strong oxidisers, and explosively with sulfuric acid at elevated temperatures</li> <li>▶ corrodes aluminium at high temperatures</li> <li>▶ is incompatible with aluminum, iron, steel</li> <li>▶ attacks some nonfluorinated plastics; may attack, extract and dissolve polypropylene</li> </ul> <p>Benzyl alcohol contaminated with 1.4% hydrogen bromide and 1.2% of dissolved iron(II) polymerises exothermically above 100 deg. C.</p> <p>Amines are incompatible with:</p> <ul style="list-style-type: none"> <li>-isocyanates, halogenated organics, peroxides, phenols (acidic), epoxides, anhydrides, and acid halides.</li> <li>-strong reducing agents such as hydrides, due to the liberation of flammable gas.</li> <li>▶ Phenols are incompatible with strong reducing substances such as hydrides, nitrides, alkali metals, and sulfides.</li> <li>▶ Avoid use of aluminium, copper and brass alloys in storage and process equipment.</li> <li>▶ Avoid strong acids, acid chlorides, acid anhydrides and chloroformates.</li> <li>▶ Avoid contact with copper, aluminium and their alloys.</li> <li>▶ Avoid reaction with oxidising agents</li> </ul>

## SECTION 8 Exposure controls / personal protection

## Control parameters

## Occupational Exposure Limits (OEL)

## INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US NIOSH Recommended Exposure Limits (RELs)	2,6-di-tert-butyl-4-methylphenol	BHT; Butylated hydroxytoluene; Dibutylated hydroxytoluene; 4-Methyl-2,6-di-tert-butyl	10 mg/m3	Not Available	Not Available	Not Available

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Source	Ingredient	Material name	TWA	STEL	Peak	Notes
		phenol				
US ACGIH Threshold Limit Values (TLV)	2,6-di-tert-butyl-4-methylphenol	Butylated hydroxytoluene (Inhalable fraction and vapor)	2 mg/m <sup>3</sup>	Not Available	Not Available	URT irr
US NIOSH Recommended Exposure Limits (RELs)	phenol	Carbolic acid, Hydroxybenzene, Monohydroxybenzene, Phenyl alcohol, Phenyl hydroxide	5 ppm / 19 mg/m <sup>3</sup>	Not Available	15.6 ppm / 60 mg/m <sup>3</sup>	[15-minute]
US OSHA Permissible Exposure Levels (PELs) - Table Z1	phenol	Phenol	5 ppm / 19 mg/m <sup>3</sup>	Not Available	Not Available	Not Available
US ACGIH Threshold Limit Values (TLV)	phenol	Phenol	5 ppm	Not Available	Not Available	URT irr; lung dam; CNS impair; BEI

## Emergency Limits

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
benzyl alcohol	Benzyl alcohol	30 ppm	52 ppm	740 ppm
nonylphenol	Nonyl phenol, 4- (branched)	3.9 mg/m <sup>3</sup>	43 mg/m <sup>3</sup>	260 mg/m <sup>3</sup>
phenol	Phenol	Not Available	Not Available	Not Available
bis(2-aminopropyl ether) propoxylated	Polyoxyalkyleneamine; (Poly(oxypropylene)diamine)	4.8 mg/m <sup>3</sup>	53 mg/m <sup>3</sup>	320 mg/m <sup>3</sup>


Ingredient	Original IDLH	Revised IDLH
4,4'-methylenebis(cyclohexylamine)	Not Available	Not Available
1,3-cyclohexanebis(methylamine)	Not Available	Not Available
benzyl alcohol	Not Available	Not Available
2,6-di-tert-butyl-4-methylphenol	Not Available	Not Available
nonylphenol	Not Available	Not Available
phenol	250 ppm	Not Available
bis(2-aminopropyl ether) propoxylated	Not Available	Not Available

## Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
4,4'-methylenebis(cyclohexylamine)	E	≤ 0.1 ppm
1,3-cyclohexanebis(methylamine)	E	≤ 0.1 ppm
benzyl alcohol	E	≤ 0.1 ppm
nonylphenol	E	≤ 0.1 ppm

**Notes:** Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.

## Exposure controls

<b>Appropriate engineering controls</b>	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
<b>Personal protection</b>	
<b>Eye and face protection</b>	<ul style="list-style-type: none"> <li>Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk-quantities, where there is a danger of splashing, or if the material may be under pressure.</li> <li>Chemical goggles whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted.</li> </ul> <p>For amines: SPECIAL PRECAUTION:  <ul style="list-style-type: none"> <li>Because amines are alkaline materials that can cause rapid and severe tissue damage, wearing of contact lenses while working with amines is strongly discouraged. Wearing such lenses can prolong contact of the eye tissue with the amine, thereby causing more severe damage.</li> </ul> </p>
<b>Skin protection</b>	See Hand protection below
<b>Hands/feet protection</b>	<ul style="list-style-type: none"> <li>Elbow length PVC gloves</li> <li>When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.</li> </ul> <p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <p>For amines:  <ul style="list-style-type: none"> <li>Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly.</li> </ul> </p>
<b>Body protection</b>	See Other protection below

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## Other protection

- ▶ Overalls.
- ▶ Eyewash unit.

## Respiratory protection

Type AK-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

- ▶ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- ▶ The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- ▶ Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used

Where engineering controls are not feasible and work practices do not reduce airborne amine concentrations below recommended exposure limits, appropriate respiratory protection should be used. In such cases, air-purifying respirators equipped with cartridges designed to protect against amines are recommended.

## SECTION 9 Physical and chemical properties

## Information on basic physical and chemical properties

Appearance	Not Available		
Physical state	Liquid	Relative density (Water = 1)	Not Available
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Available
pH (as supplied)	Not Available	Decomposition temperature	Not Available
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	Not Available	Molecular weight (g/mol)	Not Available
Flash point (°C)	99	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water	Immiscible	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

## SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> </ul>
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

## SECTION 11 Toxicological information

## Information on toxicological effects

Inhaled	<p>Inhaling corrosive bases may irritate the respiratory tract. Symptoms include cough, choking, pain and damage to the mucous membrane. Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may produce severe damage to the health of the individual. Relatively small amounts absorbed through the lungs may prove fatal.</p> <p>Inhalation of amine vapours may cause irritation of the mucous membrane of the nose and throat, and lung irritation with respiratory distress and cough. Swelling and inflammation of the respiratory tract is seen in serious cases; with headache, nausea, faintness and anxiety.</p> <p>Inhalation of epoxy resin amine hardeners (including polyamines and amine adducts) may produce bronchospasm and coughing episodes lasting several days after cessation of the exposure. Even faint traces of these vapours may trigger an intense reaction in individuals showing "amine asthma".</p> <p>Inhalation of quantities of liquid mist may be extremely hazardous, even lethal due to spasm, extreme irritation of larynx and bronchi, chemical pneumonitis and pulmonary oedema.</p> <p>Inhalation of benzyl alcohol may affect breathing (causing depression and paralysis of breathing and lower blood pressure).</p>
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## Epoxy 450 Part B

<b>Ingestion</b>	<p><b>Toxic effects</b> may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.</p> <p>Ingestion of alkaline corrosives may produce burns around the mouth, ulcerations and swellings of the mucous membranes, profuse saliva production, with an inability to speak or swallow. Both the oesophagus and stomach may experience burning pain; vomiting and diarrhoea may follow.</p> <p>Ingestion of amine epoxy-curing agents (hardeners) may cause severe abdominal pain, nausea, vomiting or diarrhoea. The vomitus may contain blood and mucus.</p> <p>Nonionic surfactants may produce localised irritation of the oral or gastrointestinal lining and induce vomiting and mild diarrhoea.</p> <p>Amines without benzene rings when swallowed are absorbed throughout the gut. Corrosive action may cause damage throughout the gastrointestinal tract.</p> <p>Swallowing large doses of benzyl alcohol may cause abdominal pain, nausea, vomiting and diarrhea. It may affect behaviour and/or the central nervous system, and cause headache, sleepiness, excitement, dizziness, inco-ordination, coma, convulsions and other symptoms of central nervous system depression.</p>
<b>Skin Contact</b>	<p>Skin contact with the material may produce toxic effects; systemic effects may result following absorption.</p> <p>Volatile amine vapours produce irritation and inflammation of the skin. Direct contact can cause burns.</p> <p>Non-ionic surfactants cause less irritation than other surfactants as they have less ability to denature protein in the skin.</p> <p>Amine epoxy-curing agents (hardeners) may produce primary skin irritation and sensitisation dermatitis in predisposed individuals. Cutaneous reactions include erythema, intolerable itching and severe facial swelling.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p> <p>The material can produce severe chemical burns following direct contact with the skin.</p>
<b>Eye</b>	<p>If applied to the eyes, this material causes severe eye damage.</p> <p>Direct eye contact with corrosive bases can cause pain and burns. There may be swelling, epithelium destruction, clouding of the cornea and inflammation of the iris.</p> <p>Vapours of volatile amines irritate the eyes, causing excessive secretion of tears, inflammation of the conjunctiva and slight swelling of the cornea, resulting in "halos" around lights. This effect is temporary, lasting only for a few hours.</p> <p>Non-ionic surfactants can cause numbing of the cornea, which masks discomfort normally caused by other agents and leads to corneal injury. Irritation varies depending on the duration of contact, the nature and concentration of the surfactant.</p>
<b>Chronic</b>	<p>There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment.</p> <p>Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue.</p> <p>Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.</p> <p>Based on experiments and other information, there is ample evidence to presume that exposure to this material can cause genetic defects that can be inherited.</p> <p>Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.</p> <p>This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.</p> <p>Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.</p> <p>Exposure to alkyl phenolics is associated with reduced sperm count and fertility in males.</p> <p>Prolonged or repeated skin contact may cause degreasing, followed by drying, cracking and skin inflammation.</p> <p>Prolonged or repeated exposure to benzyl alcohol may cause allergic contact dermatitis (skin inflammation). Prolonged or repeated swallowing may affect behaviour and the central nervous system with symptoms similar to acute swallowing.</p> <p>Amine epoxy-curing agents (hardeners) may produce primary skin irritation and sensitisation dermatitis in predisposed individuals. Cutaneous reactions include erythema, intolerable itching and severe facial swelling.</p>

<b>Epoxy 450 Part B</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Not Available	Not Available
<b>4,4'-methylenebis(cyclohexylamine)</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (rabbit) LD50: >1000 mg/kg <sup>[1]</sup>	Eye (rabbit): 10uL/24h SEVERE
	Inhalation(Mouse) LC50; =0.4 mg/l4hrs <sup>[2]</sup>	Eye: adverse effect observed (irreversible damage) <sup>[1]</sup>
	Oral(Rat) LD50; 350 mg/kg <sup>[1]</sup>	Eye: adverse effect observed (irritating) <sup>[1]</sup>
		Skin (rabbit): SEVERE Corrosive **
<b>1,3-cyclohexanebis(methylamine)</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (rabbit) LD50: 1700 mg/kg <sup>[1]</sup>	Eye: adverse effect observed (irritating) <sup>[1]</sup>
	Oral(Rat) LD50; >200-<2000 mg/kg <sup>[1]</sup>	Skin: adverse effect observed (corrosive) <sup>[1]</sup>
<b>benzyl alcohol</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (rabbit) LD50: =2000 mg/kg <sup>[2]</sup>	Eye (rabbit): 0.75 mg open SEVERE
	Inhalation(Rat) LC50; >0.9 mg/l4hrs <sup>[2]</sup>	Eye: adverse effect observed (irritating) <sup>[1]</sup>
	Oral(Rat) LD50; 1.560 mg/kg <sup>[2]</sup>	Skin (man): 16 mg/48h-mild
		Skin (rabbit):10 mg/24h open-mild
<b>2,6-di-tert-butyl-4-methylphenol</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>	Eye (rabbit): 100 mg/24h-moderate
	Oral(Rat) LD50; >2930 mg/kg <sup>[1]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>
	Skin (human): 500 mg/48h - mild	



## Epoxy 450 Part B

		Skin (rabbit):500 mg/48h-moderate
		Skin: no adverse effect observed (not irritating) <sup>[1]</sup>
nonylphenol	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (rabbit) LD50: >2000 mg/kg <sup>[2]</sup>	Eye (rabbit): 0.5 mg (open)-SEVERE
	Oral(Rat) LD50; 1000-2500 mg/kg <sup>[2]</sup>	Eye: adverse effect observed (irritating) <sup>[1]</sup>
		Skin (rabbit): 500 mg(open)-mod
		Skin(rabbit):10mg/24h(open)-SEVERE
		Skin: adverse effect observed (corrosive) <sup>[1]</sup>
phenol	<b>TOXICITY</b>	<b>IRRITATION</b>
	dermal (rat) LD50: 0.663 mg/kg <sup>[1]</sup>	Eye(rabbit): 100 mg rinse - mild
	Inhalation(Mouse) LC50; 0.177 mg/L4hrs <sup>[2]</sup>	Eye(rabbit): 5 mg - SEVERE
	Oral(Mouse) LD50; 270 mg/kg <sup>[2]</sup>	Skin(rabbit): 500 mg open -SEVERE
		Skin(rabbit): 500 mg/24hr - SEVERE
bis(2-aminopropyl ether) propoxylated	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (rabbit) LD50: 2979.7 mg/kg <sup>[1]</sup>	Eye (rabbit): 100 mg - SEVERE
	Oral(Rat) LD50; 2627.2 mg/kg <sup>[1]</sup>	Eye (rabbit): SEVERE ***
		Eye: adverse effect observed (irreversible damage) <sup>[1]</sup>
		Skin (rabbit): SEVERE ***
		Skin: adverse effect observed (corrosive) <sup>[1]</sup>
<b>Legend:</b>	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. * Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

<b>4,4'-METHYLENEBIS(CYCLOHEXYLAMINE)</b>	The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
<b>1,3-CYCLOHEXANEBIS(METHYLAMINE)</b>	For 1,3-cyclohexanebis(methylamine) (CHBM): Animal testing shows that CHBM has low to moderate acute toxicity by swallowing and moderate acute toxicity by skin contact. It is corrosive to the eyes and skin. Gastrointestinal changes recorded.
<b>BENZYL ALCOHOL</b>	Unlike benzylic alcohols, the beta-hydroxyl group of the members of benzyl alkyl alcohols contributes to break down reactions but do not undergo phase II metabolic activation. Though structurally similar to cancer causing ethyl benzene, phenethyl alcohol is only of negligible concern due to limited similarity in their pattern of activity. For benzoates: Benzyl alcohol, benzoic acid and its sodium and potassium salt have a common metabolic and excretion pathway. All but benzyl alcohol are considered to be unharmed and of low acute toxicity. This is a member or analogue of a group of benzyl derivatives generally regarded as safe (GRAS), based partly on their self-limiting properties as flavouring substances in food. In humans and other animals, they are rapidly absorbed, broken down and excreted, with a wide safety margin. The aryl alkyl alcohol (AAA) fragrance ingredients have diverse chemical structures, with similar metabolic and toxicity profiles. The AAA fragrances demonstrate low acute and subchronic toxicity by skin contact and swallowing.
<b>2,6-DI-TERT-BUTYL-4-METHYLPHENOL</b>	for bridged alkyl phenols: <b>Acute toxicity:</b> Acute oral and dermal toxicity data are available for all but two of the substances in the group. The data show that acute toxicity of these substances is low. Data show that acute toxicity following oral and topical use of hindered phenols is low. They are not proven to cause mutations. <b>NOTE:</b> Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA. * Degussa SDS Effects such as behavioral changes, reduction in body weight gain, and decrement in body weight have been observed after long-term administration of BHT to mice and rats. Toxic effects may be attributed more to BHT metabolites than to their parent compound, only a few studies have focused on their carcinogenicity and toxicity, and not only on that of BHT. The metabolite BHT-QM (syn: 2,6-di-tert-butyl-1,4-methylene-2,5-cyclohexadien-1-one, CAS RN: 2607-52-5) is a very reactive compound which is considered to play a significant role in hepatotoxicity, pneumotoxicity, and skin tumor promotion in mice. BHT has been reported to exert prooxidant effects under certain conditions. Thus, when BHT was added in excess to a wheat seedling medium in aerobic conditions, an enhancement of the generation rate of superoxide anion was observed. Some authors have reported that at high aeration rate, BHT can react with molecular oxygen rather than with the reactive oxygen species present, yielding BHT-phenoxyl radical and superoxide anion. In addition, the phenolic radical itself may undergo redox recycling which can be a critical factor depending on the reductant involved. However, it has to be noted that BHT-phenoxyl radical has been reported to be relatively stable. Furthermore, the potential reactivity of BHT-derived metabolites should be taken into account; some studies reported that not only BHT but also its metabolites, such as BHT-Q and BHT-QM, can act as prooxidant. As BHT undergoes several reactions during biotransformation, a large number of intermediate metabolites have been identified. However, their nature and concentration depend on the environmental conditions and on the animal species. Although the changes undergone by BHT during in vivo digestion processes have not been studied, after submission of a fluid deep-frying fat containing BHT and BHT-QM to an in vitro gastrointestinal digestion model, both these were detected in the digested samples. These results indicate that BHT and its toxic metabolite could remain bioaccessible for intestinal absorption. Studies concerning BHT metabolism have shown that, unlike other synthetic antioxidants, BHT is a potent inducer of the microsomal monooxygenase system and its major route of degradation is oxidation catalyzed by cytochrome P450. Studies have reported potential toxicity derived from the ingestion or administration of BHT. As for acute oral toxicity, although this is considered low in animals, it must be noted that 2 clinical cases were reported in patients who suffered acute neurotoxicity and gastritis after ingesting a high dose of BHT (4 and 80 g without medical prescription) to cure recurrent genital herpes. Regarding short-term subchronic toxicity studies, it has been reported that BHT causes dose-related increase in the incidence and severity
<b>NONYLPHENOL</b>	For nonylphenol and its compounds: Alkylphenols like nonylphenol and bisphenol A have estrogenic effects in the body. They are known as xenoestrogens. These substances are intravenous anaesthetic agents. They have a very low level of acute toxicity; they may cause skin irritation. ♦ Repeated exposure may irritate the stomach.

## Epoxy 450 Part B

	For nonylphenol: Animal testing suggests that repeated exposure to nonylphenol may cause liver changes and kidney dysfunction. Nonylphenol was not found to cause mutations or chromosomal aberrations.
<b>BIS(2-AMINOPROPYL ETHER) PROPOXYLATED</b>	Convulsions, stomach ulceration, haemorrhage, respiratory tract changes, dermatitis after systemic administration recorded. * Reichard ** Bayer Inc. Canada *** Texaco ****EpoxyLite Polyethers (such as ethoxylated surfactants and polyethylene glycols) are highly susceptible to being oxidized in the air. They then form complex mixtures of oxidation products. Animal testing reveals that whole the pure, non-oxidised surfactant is non-sensitizing, many of the oxidation products are sensitizers.
<b>Epoxy 450 Part B &amp; 4,4'-METHYLENEBIS(CYCLOHEXYLAMINE) &amp; 1,3-CYCLOHEXANEBIS(METHYLAMINE) &amp; BENZYL ALCOHOL</b>	The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type.
<b>Epoxy 450 Part B &amp; BENZYL ALCOHOL</b>	Adverse reactions to fragrances in perfumes and fragranced cosmetic products include allergic contact dermatitis, irritant contact dermatitis, sensitivity to light, immediate contact reactions, and pigmented contact dermatitis. Airborne and conjugal contact dermatitis occurs. Fragrance allergens act as haptens, low molecular weight chemicals that cause an immune response only when attached to a carrier protein. However, not all sensitizing fragrance chemicals are directly reactive, but require previous activation.
<b>Epoxy 450 Part B &amp; 4,4'-METHYLENEBIS(CYCLOHEXYLAMINE) &amp; 1,3-CYCLOHEXANEBIS(METHYLAMINE) &amp; 2,6-DI-TERT-BUTYL-4-METHYLPHENOL &amp; NONYLPHENOL &amp; PHENOL &amp; BIS(2-AMINOPROPYL ETHER) PROPOXYLATED</b>	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound.
<b>Epoxy 450 Part B &amp; 4,4'-METHYLENEBIS(CYCLOHEXYLAMINE) &amp; BIS(2-AMINOPROPYL ETHER) PROPOXYLATED</b>	Overexposure to most of these materials may cause adverse health effects. Many amine-based compounds can cause release of histamines, which, in turn, can trigger allergic and other physiological effects, including constriction of the bronchi or asthma and inflammation of the cavity of the nose. Whole-body symptoms include headache, nausea, faintness, anxiety, a decrease in blood pressure, rapid heartbeat, itching, reddening of the skin, urticaria (hives) and swelling of the face, which are usually transient. There are generally four routes of possible or potential exposure: inhalation, skin contact, eye contact, and swallowing. Inhalation: Inhaling vapours may result in moderate to severe irritation of the tissues of the nose and throat and can irritate the lungs.
<b>4,4'-METHYLENEBIS(CYCLOHEXYLAMINE) &amp; 1,3-CYCLOHEXANEBIS(METHYLAMINE)</b>	The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function.
<b>4,4'-METHYLENEBIS(CYCLOHEXYLAMINE) &amp; BENZYL ALCOHOL &amp; 2,6-DI-TERT-BUTYL-4-METHYLPHENOL</b>	The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
<b>1,3-CYCLOHEXANEBIS(METHYLAMINE) &amp; NONYLPHENOL &amp; PHENOL &amp; BIS(2-AMINOPROPYL ETHER) PROPOXYLATED</b>	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
<b>1,3-CYCLOHEXANEBIS(METHYLAMINE) &amp; NONYLPHENOL &amp; PHENOL</b>	The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may produce severe ulceration.
<b>2,6-DI-TERT-BUTYL-4-METHYLPHENOL &amp; PHENOL</b>	The substance is classified by IARC as Group 3: <b>NOT</b> classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.

<b>Acute Toxicity</b>	✓	<b>Carcinogenicity</b>	✓
<b>Skin Irritation/Corrosion</b>	✓	<b>Reproductivity</b>	✓
<b>Serious Eye Damage/Irritation</b>	✓	<b>STOT - Single Exposure</b>	✗
<b>Respiratory or Skin sensitisation</b>	✓	<b>STOT - Repeated Exposure</b>	✓
<b>Mutagenicity</b>	✓	<b>Aspiration Hazard</b>	✗

**Legend:** ✗ – Data either not available or does not fill the criteria for classification  
 ✓ – Data available to make classification

## SECTION 12 Ecological information

## Toxicity

Epoxy 450 Part B	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
4,4'-methylenebis(cyclohexylamine)	Endpoint	Test Duration (hr)	Species	Value	Source
	LC50	96	Fish	68mg/L	2
	EC50	48	Crustacea	6.84mg/L	2
	EC50	72	Algae or other aquatic plants	670mg/L	2
	EC0	48	Crustacea	2.5mg/L	2
1,3-cyclohexanebis(methylamine)	Endpoint	Test Duration (hr)	Species	Value	Source
	LC50	96	Fish	130mg/L	2
	EC50	48	Crustacea	33.1mg/L	2

Continued...

## Epoxy 450 Part B

	EC50	72	Algae or other aquatic plants	29.7mg/L	2
	NOEC	72	Algae or other aquatic plants	13.7mg/L	2
benzyl alcohol	<b>Endpoint</b>	<b>Test Duration (hr)</b>	<b>Species</b>	<b>Value</b>	<b>Source</b>
	LC50	96	Fish	10-mg/L	4
	EC50	48	Crustacea	230mg/L	2
	EC50	96	Algae or other aquatic plants	76.828mg/L	2
	NOEC	336	Fish	5.1mg/L	2
2,6-di-tert-butyl-4-methylphenol	<b>Endpoint</b>	<b>Test Duration (hr)</b>	<b>Species</b>	<b>Value</b>	<b>Source</b>
	LC50	96	Fish	0.199mg/L	2
	EC50	48	Crustacea	>0.17mg/L	2
	EC50	72	Algae or other aquatic plants	>0.24mg/L	2
	NOEC	504	Crustacea	0.023mg/L	2
nonylphenol	<b>Endpoint</b>	<b>Test Duration (hr)</b>	<b>Species</b>	<b>Value</b>	<b>Source</b>
	LC50	96	Fish	-0.098-0.187mg/L	4
	EC50	48	Crustacea	-0.0874-0.124mg/L	4
	EC50	96	Algae or other aquatic plants	0.027mg/L	1
	BCF	96	Not Available	1.13-mg/L	4
	EC05	96	Not Available	-0.00051-0.00161mg/L	4
	NOEC	96	Fish	0.0001-mg/L	4
phenol	<b>Endpoint</b>	<b>Test Duration (hr)</b>	<b>Species</b>	<b>Value</b>	<b>Source</b>
	LC50	96	Fish	0.00175-mg/L	4
	EC50	48	Crustacea	3.1mg/L	2
	EC50	96	Algae or other aquatic plants	-0.0188-0.1044mg/L	4
	BCF	88	Not Available	63.6mg/L	4
	EC10	504	Crustacea	0.05mg/L	2
	NOEC	144	Crustacea	0.01-mg/L	4
bis(2-aminopropyl ether) propoxylated	<b>Endpoint</b>	<b>Test Duration (hr)</b>	<b>Species</b>	<b>Value</b>	<b>Source</b>
	LC50	96	Fish	772.14mg/L	2
	EC50	48	Crustacea	80mg/L	2
	EC50	72	Algae or other aquatic plants	2.1mg/L	2
	NOEC	72	Algae or other aquatic plants	0.32mg/L	2

**Legend:**

Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

On the basis of available evidence concerning either toxicity, persistence, potential to accumulate and/or observed environmental fate and behaviour, the material may present a danger, immediate or long-term and/or delayed, to the structure and/or functioning of natural ecosystems.

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

Surfactants are in general toxic to aquatic organisms due to their surface-active properties. Historically, synthetic surfactants were often composed of branched alkyl chains resulting in poor biodegradability which led to concerns about their environmental effects.

For Phenols:

Ecotoxicity - Phenols with log Pow >7.4 are expected to exhibit low toxicity to aquatic organisms however; the toxicity of phenols with a lower log Pow is variable. Dinitrophenols are more toxic than predicted from QSAR estimates.

For Surfactants: Kow cannot be easily determined due to hydrophilic/hydrophobic properties of the molecules in surfactants. BCF value: 1-350.

For Alkylphenols and their Ethoxylates, or Propoxylates (APE):

Environmental fate: Alkylphenols are found everywhere in the environmental, when released. Releases are generally as wastes; they are extensively used throughout industry and in the home.

For benzyl alcohol: log Kow : 1.1Koc : <5Henry's atm m3 /mol: 3.91E-07BOD 5: 1.55-1.6,33-62%COD : 96%ThOD : 2.519BCF : 4

Bioaccumulation: Not significant

Anaerobic Effects: Significant degradation.

Effects on algae and plankton: Inhibits degradation of glucose

Degradation Biological: Significant processes

Abiotic: RxnOH\*, no photochem

Ecotoxicity: Fish LC50 (48 h): fathead minnow 770 mg/l; (72 h): 480 mg/l; (96 h) 460 mg/l.

Prevent, by any means available, spillage from entering drains or water courses.

**DO NOT discharge into sewer or waterways.**

**Persistence and degradability**

Ingredient	Persistence: Water/Soil	Persistence: Air
4,4'-methylenebis(cyclohexylamine)	HIGH	HIGH
1,3-cyclohexanebis(methylamine)	LOW	LOW
benzyl alcohol	LOW	LOW

## Epoxy 450 Part B

Ingredient	Persistence: Water/Soil	Persistence: Air
2,6-di-tert-butyl-4-methylphenol	HIGH	HIGH
nonylphenol	HIGH	HIGH
phenol	LOW (Half-life = 10 days)	LOW (Half-life = 0.95 days)

## Bioaccumulative potential

Ingredient	Bioaccumulation
4,4'-methylenebis(cyclohexylamine)	LOW (LogKOW = 3.2649)
1,3-cyclohexanebis(methylamine)	LOW (LogKOW = 1.0688)
benzyl alcohol	LOW (LogKOW = 1.1)
2,6-di-tert-butyl-4-methylphenol	HIGH (BCF = 2500)
nonylphenol	LOW (BCF = 271)
phenol	LOW (BCF = 17.5)

## Mobility in soil

Ingredient	Mobility
4,4'-methylenebis(cyclohexylamine)	LOW (KOC = 672.4)
1,3-cyclohexanebis(methylamine)	LOW (KOC = 914.6)
benzyl alcohol	LOW (KOC = 15.66)
2,6-di-tert-butyl-4-methylphenol	LOW (KOC = 23030)
nonylphenol	LOW (KOC = 56010)
phenol	LOW (KOC = 268)



## SECTION 13 Disposal considerations

## Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> <li>▶ Containers may still present a chemical hazard/ danger when empty.</li> <li>▶ Return to supplier for reuse/ recycling if possible.</li> </ul> <p>Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area.</p> <ul style="list-style-type: none"> <li>▶ <b>DO NOT allow wash water from cleaning or process equipment to enter drains.</b></li> <li>▶ It may be necessary to collect all wash water for treatment before disposal.</li> <li>▶ Recycle wherever possible or consult manufacturer for recycling options.</li> <li>▶ Consult State Land Waste Authority for disposal.</li> </ul>
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## SECTION 14 Transport information

## Labels Required

	
Marine Pollutant	

## Land transport (DOT)

UN number	2735	
UN proper shipping name	Amines, liquid, corrosive, n.o.s. (contains 1,3-cyclohexanebis(methylamine))	
Transport hazard class(es)	Class	8
	Subrisk	Not Applicable
Packing group	III	
Environmental hazard	Environmentally hazardous	
Special precautions for user	Hazard Label	8
	Special provisions	IB3, T7, TP1, TP28

## Air transport (ICAO-IATA / DGR)

UN number	2735
UN proper shipping name	Amines, liquid, corrosive, n.o.s. (contains 1,3-cyclohexanebis(methylamine))

## Epoxy 450 Part B

<b>Transport hazard class(es)</b>	ICAO/IATA Class	8
	ICAO / IATA Subrisk	Not Applicable
	ERG Code	8L
<b>Packing group</b>	III	
<b>Environmental hazard</b>	Environmentally hazardous	
<b>Special precautions for user</b>	Special provisions	A3 A803
	Cargo Only Packing Instructions	856
	Cargo Only Maximum Qty / Pack	60 L
	Passenger and Cargo Packing Instructions	852
	Passenger and Cargo Maximum Qty / Pack	5 L
	Passenger and Cargo Limited Quantity Packing Instructions	Y841
	Passenger and Cargo Limited Maximum Qty / Pack	1 L

**Sea transport (IMDG-Code / GGVSee)**

<b>UN number</b>	2735	
<b>UN proper shipping name</b>	AMINES, LIQUID, CORROSIVE, N.O.S. (contains 1,3-cyclohexanebis(methylamine))	
<b>Transport hazard class(es)</b>	IMDG Class	8
	IMDG Subrisk	Not Applicable
<b>Packing group</b>	III	
<b>Environmental hazard</b>	Marine Pollutant	
<b>Special precautions for user</b>	EMS Number	F-A , S-B
	Special provisions	223 274
	Limited Quantities	5 L

**Transport in bulk according to Annex II of MARPOL and the IBC code**

Not Applicable

**Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code**

Product name	Group
4,4'-methylenebis(cyclohexylamine)	Not Available
1,3-cyclohexanebis(methylamine)	Not Available
benzyl alcohol	Not Available
2,6-di-tert-butyl-4-methylphenol	Not Available
nonylphenol	Not Available
phenol	Not Available
bis(2-aminopropyl ether) propoxylated	Not Available

**Transport in bulk in accordance with the ICG Code**

Product name	Ship Type
4,4'-methylenebis(cyclohexylamine)	Not Available
1,3-cyclohexanebis(methylamine)	Not Available
benzyl alcohol	Not Available
2,6-di-tert-butyl-4-methylphenol	Not Available
nonylphenol	Not Available
phenol	Not Available
bis(2-aminopropyl ether) propoxylated	Not Available

**SECTION 15 Regulatory information****Safety, health and environmental regulations / legislation specific for the substance or mixture****4,4'-methylenebis(cyclohexylamine) is found on the following regulatory lists**

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

US TSCA Chemical Substance Inventory - Interim List of Active Substances

**1,3-cyclohexanebis(methylamine) is found on the following regulatory lists**

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

US TSCA Chemical Substance Inventory - Interim List of Active Substances

**benzyl alcohol is found on the following regulatory lists**

Continued...

## Epoxy 450 Part B

US DOE Temporary Emergency Exposure Limits (TEELs)  
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

US Toxicology Excellence for Risk Assessment (TERA) Workplace Environmental Exposure Levels (WEEL)  
US TSCA Chemical Substance Inventory - Interim List of Active Substances

**2,6-di-tert-butyl-4-methylphenol is found on the following regulatory lists**

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs  
US ACGIH Threshold Limit Values (TLV)  
US ACGIH Threshold Limit Values (TLV) - Carcinogens  
US AIHA Workplace Environmental Exposure Levels (WEELs)

US NIOSH Recommended Exposure Limits (RELs)  
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory  
US TSCA Chemical Substance Inventory - Interim List of Active Substances

**nonylphenol is found on the following regulatory lists**

Chemical Footprint Project - Chemicals of High Concern List  
US DOE Temporary Emergency Exposure Limits (TEELs)  
US EPCRA Section 313 Chemical List  
US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory  
US TSCA Chemical Substance Inventory - Interim List of Active Substances  
US TSCA Section 12(b) - List of Chemical Substances Subject to Export Notification Requirements  
US TSCA Section 4/12 (b) - Sunset Dates/Status

**phenol is found on the following regulatory lists**

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs  
US - California Hazardous Air Pollutants Identified as Toxic Air Contaminants  
US ACGIH Threshold Limit Values (TLV)  
US ACGIH Threshold Limit Values (TLV) - Carcinogens  
US AIHA Workplace Environmental Exposure Levels (WEELs)  
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)  
US Clean Air Act - Hazardous Air Pollutants  
US CWA (Clean Water Act) - List of Hazardous Substances  
US CWA (Clean Water Act) - Priority Pollutants  
US CWA (Clean Water Act) - Toxic Pollutants

US DOE Temporary Emergency Exposure Limits (TEELs)  
US EPA Integrated Risk Information System (IRIS)  
US EPCRA Section 313 Chemical List  
US NIOSH Recommended Exposure Limits (RELs)  
US OSHA Permissible Exposure Levels (PELs) - Table Z1  
US OSHA Permissible Exposure Limits - Annotated Table Z-1  
US SARA Section 302 Extremely Hazardous Substances  
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory  
US TSCA Chemical Substance Inventory - Interim List of Active Substances  
US TSCA Section 4/12 (b) - Sunset Dates/Status

**bis(2-aminopropyl ether) propoxylated is found on the following regulatory lists**

US DOE Temporary Emergency Exposure Limits (TEELs)  
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

US TSCA Chemical Substance Inventory - Interim List of Active Substances

**Federal Regulations****Superfund Amendments and Reauthorization Act of 1986 (SARA)****Section 311/312 hazard categories**

Flammable (Gases, Aerosols, Liquids, or Solids)	No
Gas under pressure	No
Explosive	No
Self-heating	No
Pyrophoric (Liquid or Solid)	No
Pyrophoric Gas	No
Corrosive to metal	Yes
Oxidizer (Liquid, Solid or Gas)	No
Organic Peroxide	No
Self-reactive	No
In contact with water emits flammable gas	No
Combustible Dust	No
Carcinogenicity	Yes
Acute toxicity (any route of exposure)	Yes
Reproductive toxicity	Yes
Skin Corrosion or Irritation	Yes
Respiratory or Skin Sensitization	Yes
Serious eye damage or eye irritation	Yes
Specific target organ toxicity (single or repeated exposure)	Yes
Aspiration Hazard	No
Germ cell mutagenicity	Yes
Simple Asphyxiant	No
Hazards Not Otherwise Classified	No

**US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)**

Name	Reportable Quantity in Pounds (lb)	Reportable Quantity in kg
Phenol	1000	454

**State Regulations****US. California Proposition 65**

## Epoxy 450 Part B

None Reported

## National Inventory Status

National Inventory	Status
Australia - AIIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (4,4'-methylenebis(cyclohexylamine); 1,3-cyclohexanebis(methylamine); benzyl alcohol; phenol; bis(2-aminopropyl ether) propoxylated)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	No (bis(2-aminopropyl ether) propoxylated)
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	No (4,4'-methylenebis(cyclohexylamine); 1,3-cyclohexanebis(methylamine))
Vietnam - NCI	Yes
Russia - ARIPS	Yes
<b>Legend:</b>	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)

## SECTION 16 Other information

Revision Date	03/03/2021
Initial Date	06/28/2020

## CONTACT POINT

\*\*PLEASE NOTE THAT TITANIUM DIOXIDE IS NOT PRESENT IN CLEAR OR NEUTRAL BASES\*\*

## SDS Version Summary

Version	Issue Date	Sections Updated
4.5.1.1.1	03/03/2021	Acute Health (inhaled), Chronic Health, Environmental, Exposure Standard, Ingredients, Storage (storage incompatibility)

## Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

## Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average  
 PC—STEL: Permissible Concentration-Short Term Exposure Limit  
 IARC: International Agency for Research on Cancer  
 ACGIH: American Conference of Governmental Industrial Hygienists  
 STEL: Short Term Exposure Limit  
 TEEL: Temporary Emergency Exposure Limit.  
 IDLH: Immediately Dangerous to Life or Health Concentrations  
 OSF: Odour Safety Factor  
 NOAEL :No Observed Adverse Effect Level  
 LOAEL: Lowest Observed Adverse Effect Level  
 TLV: Threshold Limit Value  
 LOD: Limit Of Detection  
 OTV: Odour Threshold Value  
 BCF: BioConcentration Factors  
 BEI: Biological Exposure Index

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