





**2.2. Label elements**

- Symbol(s)** :   
  
 Irritant  
 Dangerous for the environment.
- Risk phrases** : R36/38 - Irritating to eyes and skin.  
 R43 - May cause sensitization by skin contact.  
 R51/53 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- Safety phrases** : S23 -Do not breathe gas/fumes/vapor/spray.  
 S24 -Avoid contact with skin.  
 S26 -In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
 S37 -Wear suitable gloves.  
 S60 -This material and its container must be disposed of as hazardous waste.  
 S61 -Avoid release to the environment. Refer to special instructions/safety data sheet.
- Contains** : reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700), 1,6-bis(2,3-epoxypropoxy)hexane,
- Product use** : Industrial applications

**2.3. Other hazards**

Based on the substance information, the mixture is not expected to meet the criteria for PBT/vPvB.

**SECTION 3: Composition/information on ingredients**

**Substance/mixture** : Preparation

Ingredient name	REG # /CAS #/EC #	Classification		%
		Symbol(s)/Hazard Class and Category Code(s)	R-Phrases /Hazard statement Code(s)	
reaction product: bisphenol-A-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700)	01-211945661 9-26-0002/ 25068-38-6/ 500-033-5	Xi; N;	Xi; R36/38 R43 N; R51 R53	70 - 90
		Aquatic Chronic 2 Skin Sens. 1 Skin Corr./Irrit. 2 Eye Dam./Irrit. 2	H411 H317 H315 H319	
1,6-bis(2,3-epoxypropoxy)hexane	01-211946347 1-41-0000/ 16096-31-4/ 240-260-4	Xi;	R52/53 R43 Xi; R36/38	15 - 20
		Aquatic Chronic 3 Eye Dam./Irrit. 2 Skin Corr./Irrit. 2 Skin Sens. 1	H412 H319 H315 H317	

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See Section 16 for the full text of the H statements and R phrases declared above.

## **SECTION 4: First aid measures**

### **4.1. Description of first aid measures**

#### **First aid measures**

##### **Inhalation**

- : Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately.

##### **Ingestion**

- : Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

##### **Skin contact**

- : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

##### **Eye contact**

- : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

### **4.2. Most important symptoms and effects, both acute and delayed**

#### **Over-exposure signs/symptoms**

##### **Inhalation**

- : No specific data.

##### **Ingestion**

- : No specific data.

##### **Skin**

- : Adverse symptoms may include the following: irritation, redness,

##### **Eyes**

- : Adverse symptoms may include the following: irritation, watering, redness,

See section 11 for more detailed information on health effects and symptoms.

#### **4.3. Indication of immediate medical attention and special treatment needed**

- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Protection of first aid personnel** : 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. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

### **SECTION 5: Fire-fighting measures**

#### **5.1. Extinguishing media**

- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.

#### **5.2. Special hazards arising from the substance or mixture**

- Hazards from the substance or mixture** : In a fire or if heated, a pressure increase will occur and the container may burst.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials: carbon dioxide, carbon monoxide,

#### **5.3. Special protective actions for fire-fighters**

- Special precautions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. This material is toxic to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

### **SECTION 6: Accidental release measures**

#### **6.1. Personal precautions, protective equipment and emergency procedures**

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

#### **6.2. Environmental precautions**

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

**6.3. Methods and material for containment and cleaning up**

- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

**SECTION 7: Handling and storage****7.1. Precautions for safe handling**

Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Avoid release to the environment. Refer to special instructions/safety data sheet. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**7.2. Conditions for safe storage, including any incompatibilities**

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

**Packaging materials**

**Recommended** : Use original container.

**Specific uses** : Epoxy Resin Systems

**7.3. Specific end use(s)**

Not applicable.

**SECTION 8: Exposure controls/personal protection****8.1. Control parameters****Exposure limit values****Ingredient name****United Kingdom (UK)**

No exposure limit value known.

**Occupational exposure limits**

**Derived No-Effect Levels' (DNEL's) and Predicted No-Effect Concentrations' (PNEC's)****Explanatory note:**

REACH requires manufacturers and importers to establish and report 'Derived No-Effect Levels' (DNEL's) for humans by inhalation, ingestion and dermal routes of exposure and 'Predicted No-Effect Concentrations' (PNEC's) for environmental exposure. DNEL's and PNEC's are established by the registrant without an official consultation process, and are not intended to be directly used for setting workplace or general population exposure limits. They are primarily used as input values in running Quantitative Risk Assessment models (like the ECETOC-TRA model).

Due to differences in calculation methodology the DNEL will tend to be lower (sometimes significantly) than any corresponding health-based OEL for that chemical substance. Further although DNEL's (and PNEC's) are an indication for setting risk reduction measures, it should be recognized that these limits do not have the same regulatory application as officially endorsed governmental OEL's.

**DNELs**

<b>Ingredient name</b>	<b>Exposure /Effects</b>	<b>DNELs</b>	<b>Population</b>
reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight < 700)			
	Short term Dermal/Systemic	8.3 mg/kg bw/day	Workers
	Short term Inhalation/Systemic	12.3 mg/m <sup>3</sup>	Workers
	Long term Dermal/Systemic	8.3 mg/kg bw/day	Workers
	Long term Inhalation/Systemic	12.3 mg/m <sup>3</sup>	Workers
	Short term Dermal/Systemic	3.6 mg/kg bw/day	General
	Short term Inhalation/Systemic	0.75 mg/m <sup>3</sup>	General
	Short term Oral/Systemic	0.75 mg/kg bw/day	General
	Long term Dermal/Systemic	3.6 mg/kg bw/day	General
	Long term Inhalation/Systemic	0.75 mg/m <sup>3</sup>	General
	Long term Oral/Systemic	0.75 mg/kg bw/day	General
1,6-bis(2,3-epoxypropoxy)hexane			
	Long term Inhalation/Systemic	4.9 mg/m <sup>3</sup>	Workers
	Long term Dermal/Local	22.6 µg/cm <sup>2</sup>	Workers
	Long term Dermal/Systemic	2.8 mg/kg bw/day	Workers
	Long term Inhalation/Local	0.44 mg/m <sup>3</sup>	Workers
	Short term Dermal/Systemic	1.7 mg/kg bw/day	General
	Short term Inhalation/Systemic	2.9 mg/m <sup>3</sup>	General
	Short term Oral/Systemic	0.83 mg/kg bw/day	General
	Short term Dermal/Local	13.6 µg/cm <sup>2</sup>	General
	Long term Dermal/Systemic	1.7 mg/kg bw/day	General
	Long term Inhalation/Systemic	2.9 mg/m <sup>3</sup>	General
	Long term Oral/Systemic	0.83 mg/kg bw/day	General
	Long term Dermal/Local	13.6 µg/cm <sup>2</sup>	General
	Long term Inhalation/Local	0.27 mg/m <sup>3</sup>	General

**PNECs**

<b>Ingredient name</b>	<b>Compartment Detail</b>	<b>PNECs</b>	<b>Method Detail</b>
reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight < 700)			
	Fresh water	3 µg/l	
	Marine	0.3 µg/l	
	Sewage Treatment Plant	10 mg/l	

	Fresh water sediment	0.5 mg/kg dwt
	Marine water sediment	0.5 mg/kg dwt
	Sediment	0.05 mg/kg dwt
	Intermittent Releases	0.013 mg/l
1,6-bis(2,3-epoxypropoxy)hexane		
	Fresh water	0.0115 mg/l
	Marine	1.15 µg/l
	Marine water sediment	0.283 mg/kg dwt
	Fresh water sediment	0.283 mg/kg dwt
	Intermittent Releases	0.115 mg/l

## **8.2. Exposure controls**

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.
- Occupational exposure controls** : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hand protection** :  
 - Nitrile rubber gloves  
 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.  
 - Nitrile rubber gloves
- Eye protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

- Skin protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

<b>Appearance</b>	
Physical state	: Liquid
Color	: Yellow
Odor	: characteristic.
Odor threshold	: Not determined
pH	: Not determined
Initial boiling point and boiling range	: Greater than 200 °C (392 °F)
Flash point	: Greater than 200 °C (392 °F)
Evaporation rate	: Not determined
Flammability	: Not determined
<b>Explosion limits</b>	
Upper:	: Not determined
Lower:	: Not determined
Vapor pressure	: Not determined
Vapor density	: Not determined
Relative density	: Not determined
Solubility	: Insoluble
Partition coefficient: n-octanol/water	: Not determined
Auto-ignition temperature	: Not determined
Decomposition temperature	: Not determined
Viscosity	: Kinematic-Not determined Dynamic- 800 - 1,100 mPa·s @25 °C (77 °F) DIN 53015
Explosive properties	: Not determined
Oxidising properties	: Not determined

### 9.2. Other information

Not applicable.

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Stable under normal conditions.

### 10.2. Chemical stability

The product is stable.

### 10.3. Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

### 10.4. Conditions to avoid

Avoid release to the environment. Refer to special instructions/safety data sheet.



**10.5. Incompatible materials**

No specific data.

**10.6. Hazardous decomposition products**

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

**SECTION 11: Toxicological information****Summary of health effects based on the conventional method of Directive 1999/45/EC**

Irritating to eyes and skin. May cause sensitization by skin contact.

**11.1. Information on toxicological effects*****EPIKOTE™ Resin MGS RIMR 135*****Acute toxicity****Oral**

No applicable toxicity data.

**Dermal**

No applicable toxicity data.

**Inhalation**

No applicable toxicity data.

**Other routes**

No applicable toxicity data.

**Irritation/Corrosion**

No applicable toxicity data.

**Skin sensitization**

No applicable toxicity data.

**Respiratory sensitization**

No applicable toxicity data.

**Repeated Dose Toxicity**

No applicable toxicity data.

**Carcinogenicity**

No applicable toxicity data.

**Mutagenicity**

No applicable toxicity data.

**Toxic to Reproduction**

No applicable toxicity data.

***reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)***

**Acute toxicity****Oral**

LD50: Rat 30,000 mg/kg;

Not acutely toxic in multiple mouse and rat studies, LD50 > 2000 mg/kg of body weight.

**Dermal**

LD50: Rat > 1,200 mg/kg;

In a rat OECD no. 402 study the dermal LD50 was > 2000 mg/kg. In multiple rabbit acute dermal studies the LD50 was > 2000 mg/kg. One rabbit study reported an LD50 value of 23 grams/kg.

**Inhalation**

No applicable toxicity data. No known significant effects or critical hazards.

Due to the very low vapor pressure, saturated atmosphere = 0.008 ppb, meaningful acute inhalation studies could not be conducted.

**Other routes**

No applicable toxicity data. No known significant effects or critical hazards.

**Skin corrosion/irritation**

In an OECD No. 404 study conducted on the rabbit with a 4 hr occlusive exposure scores for erythema and oedema were minimal. Therefore, BADGE is not a skin irritant. In other studies conducted with the rabbit a 4 hr occlusive exposure was used. Maximum erythema and oedema scores observed under these extreme conditions were 1.5-2 and 1-1.5 respectively.

**Serious eye damage/irritation**

The results of an OECD No. 405 GLP study conducted in 2007 reported a mean maximum irritation score of 1.7. Therefore BADGE was not an eye irritant in this study. The results of multiple older non-guideline studies support this finding.

**Skin sensitization**

In an OECD No. 429 mouse LLNA study the estimated EC3 was a concentration of 5.7% suggesting that BADGE is a moderate skin sensitizer in this test system. In an OECD No. 406 guinea pig Maximization study BADGE induced positive dermal reaction in 100% of the test animals at a 50% concentration challenge dose. Therefore, BADGE is an "Extreme" skin sensitizer under the conditions of this study. BADGE was also positive for skin sensitization in an OECD No. 406 guinea pig Buehler method study.

**Respiratory sensitization**

No applicable toxicity data. No known significant effects or critical hazards.

**Germ cell mutagenicity**

BADGE induced gene-mutation in Ames/Salmonella tester strains TA1535 and TA100 in multiple studies. Generally, mutagenic activity was greater without liver S9 metabolic activation. Induced gene-mutation in L5178Y mouse lymphoma cells. Induced gene-mutation and chromosome damage in Chinese hamster V79 cells. Induced cell transformation in Syrian hamster BHK cells based on clonal growth in soft agar. Did not induce evidence of chromosome damage in a mouse dominant lethal oral gavage study conducted up to a high dose level of 10 grams/kg and in a mouse micronucleus test conducted up to a high dose of 5000 mg/kg. Negative in a male mouse spermatocyte cytogenetic assay with treatment for 5 days by oral gavage up to a high dose of 3000 mg/kg. Did not induce an increase in the frequency of chromosome damage in a Chinese hamster bone marrow cytogenetic test by oral gavage up to a high dose of 3300 mg/kg. Failed to induce an increase of DNA strand breaks in rat liver cells following oral gavage treatment with 500 mg/kg as measured by alkaline elution.

**Carcinogenicity**

In a rat oral gavage OECD no. 453 study there was no evidence of carcinogenicity up to the high dose level of 100 mg/kg/day. OECD Test Guideline no. 453 dermal exposure studies were conducted on male mice and female rats. No evidence of carcinogenicity was observed in male mice treated up to the high dose of 100 mg/kg/day and female rats exposed up to a high dose level of 1000 mg/kg/day.

**Reproductive toxicity**

No adverse reproductive effects were observed in an O.E.C.D. Test Guideline no. 416 GLP two-generation rat oral gavage study conducted up to a high dose level of 750 mg/kg/day that resulted in adult body weight decrements.

**Developmental / Teratogenicity**

BADGE did not induce any evidence of development toxicity in rats and rabbits exposed by oral gavage or in rabbits treated by the dermal route in OECD Test Guideline no. 414 GLP studies. The oral gavage studies were conducted up to a high dose level of 180 mg/kg/day that produced maternal toxicity based on decreased body weight gain. The rabbit dermal study was conducted up to a high dose of 300 mg/kg/day that induced maternal toxicity based on reduced body weight gain.

**STOT-single exposure**

No applicable toxicity data. No known significant effects or critical hazards.

**STOT-repeated exposure**

In a rat OECD test guideline no. 408 sub chronic oral study the NOAEL was 50 mg/kg/day. Significant dose-related evidence of hematotoxicity was observed at doses of 250 & 1000 mg/kg/day. There was a significant increase of blood urea nitrogen at 250 & 1000 mg/kg/day and slight histopathological evidence of kidney involvement at the high dose of 1000 mg/kg/day. Histological examination identified slight to moderate degeneration of the seminiferous tubules at 1000 mg/kg/day and possible uterine effects at the same dose. The NOAEL for a rat 90-day dermal (5 days/week) study was 100 mg/kg/day due to body weight decrements at 1000 mg/kg/day. Based on chronic dermatitis the LOAEL for adverse dermal effects in this study was 10 mg/kg/day. No evidence of neurotoxicity was observed in a rat 90-day dermal OECD Test Guideline no. 411 GLP study conducted up to a high dose level of 1000 mg/kg/day with FOB, motor activity and neurohistopathological assessments.

**Aspiration hazard**

No applicable toxicity data. No known significant effects or critical hazards.

**Other information**

No applicable toxicity data. No known significant effects or critical hazards.

***1,6-bis(2,3-epoxypropoxy)hexane*****Acute toxicity****Oral**

LD50: Rat 2,900 mg/kg;

1,6-Hexanediol Diglycidylether (HDDGE) was assessed for acute oral toxicity in Sprague-Dawley rats by an O.E.C.D. 401 Testing Guideline study with GLP compliance. The acute oral median lethal dose (LD50) and 95% confidence limits for 1,6-hexanediol diglycidyl ether in Sprague-Dawley rats was 3741 (3341-4085) mg/kg body weight. This degree of oral toxicity does not require classification or labelling according to the criteria of the Commission of the European Communities (Annex VI of Council Directive 67/548/EEC).

**Dermal**

LD50: Rat > 2,000 mg/kg;

1,6-Hexanediol Diglycidylether (HDDGE) was evaluated for acute dermal toxicity potential to rats in an O.E.C.D. 402 Testing Guideline study conducted with GLP compliance. No mortalities were observed in the study. The no observed effect level (NOEL) of the test material, 1,6-Hexanediol Diglycidylether, in the Sprague-Dawley strain rat was found to be greater than 2000 mg/kg bodyweight.

**Inhalation**

No applicable toxicity data. No known significant effects or critical hazards.

1,6-Hexanediol Diglycidylether (HDDGE) was assessed for acute inhalation toxicity potential by an O.E.C.D. 433 Testing Guideline study conducted with GLP compliance. The animals were exposed by whole body inhalation to primarily vapor phase HDDGE. The highest attainable concentration of HDDGE, 0.035 mg/l of air (3.7 ppm), induced no mortalities and was not toxic to rats after a single, 4-hour, whole-body exposure.

**Other routes**

No applicable toxicity data. No known significant effects or critical hazards.

**Skin corrosion/irritation**

1,6-Hexanediol Diglycidylether (HDDGE) was evaluated for skin irritation/corrosion potential in a non-guideline, occlusive, repeated-application study in rabbits. The repeated exposure was for 24 hr with occlusion for 5 consecutive followed by a 5 day recovery period. Under these extreme conditions of treatment 1,6 -Hexanediol Diglycidylether (HDDGE) was found to cause extreme irritation with corrosion when applied to intact and abraded rabbit skin. The calculated primary irritation index was 6.4. Due to the extreme non-guideline, occlusive repeated dermal exposure, the findings from this study should not be used for Classification and Labeling purposes.

**Serious eye damage/irritation**

1,6-Hexanediol Diglycidylether (HDDGE) was accessed for the potential to be a rabbit eye irritant in a Draize method study. Three of the six animals had their treated eye washed with physiological saline approximately 30 seconds following the initiation of treatment. Based on conjunctival irritation scores, 1,6-Hexanediol Diglycidylether is a rabbit eye irritant for Classification and Labeling purposes. However, washing of treated eyes with physiological saline prevented significant irritation.

**Skin sensitization**

1,6-Hexanediol Diglycidylether (HDDGE) was evaluated for skin sensitizing potential in a mouse LLNA O.E.C.D. 429 Testing Guideline study with GLP compliance including test substance stability and concentration verification. HDDGE was found to be a dermal sensitizer in the mouse LLNA assay. The authors concluded that the Estimated Concentration 3 for HDDGE based on DPM data was 1.9% wt/v and judged HDDGE to have moderate dermal sensitizing potential based on the outcome of this study. The Worker Dermal DMEL/DNEL based on the results of this study was estimated to be 22.6 ug/cm<sup>2</sup>.

**Respiratory sensitization**

No applicable toxicity data. No known significant effects or critical hazards.

**Germ cell mutagenicity**

1,6-Hexanediol Diglycidylether (HDDGE) was evaluated for mutagenic potential in an O.E.C.D. bacterial mutation 471 Testing Guideline study with GLP compliance. Dose-related increases of the mutant frequency were observed in tester strains TA 1535, TA 1538 and TA 100. HDDGE was mutagenic to strains TA 1535 and TA 100 with and without rat liver derived S9 metabolic activation preparation. Therefore, under the experimental conditions reported, 1,6-Hexanediol Diglycidylether did induce point mutations by base pair changes (or frameshifts in strain TA 1538) in the genome of the strains used and HDDGE is considered to be mutagenic in this Salmonella typhimurium reverse mutation assay.

**Carcinogenicity**

In accordance with Column 2 of REACH, Annex X, the test (required in Section 8.9.1) does not need to be conducted based on the findings of the Chemical Safety Assessment. Furthermore, 1,6-Hexanediol Diglycidylether is not genotoxic in vivo and is not a Category 3 Mutagen.

**Reproductive toxicity**

An O.E.C.D. 415 "Enhanced" One-Generation Reproduction Toxicity Study or O.E.C.D. 416 Two-Generation Reproduction Toxicity Study in the rat by an appropriate route is proposed by the consortium members, subject to approval of the Test Plan by E.C.H.A.

**Developmental / Teratogenicity**

O.E.C.D. Test Guideline 414 Developmental studies in the rat and rabbit by an appropriate route are proposed by the consortium members as per RIP 3.3. Chapter R.7A, Section R.7.6.6.4. Elements of ITS, subject to approval of the Test Plan by E.C.H.A.

**STOT-single exposure**

No applicable toxicity data. No known significant effects or critical hazards.

**STOT-repeated exposure**

An O.E.C.D. Testing Guideline No 422 study was conducted at the oral gavage dose level of 1,6-Hexanediol Diglycidylether (HDDGE) of 0, 50, 200 and 500 mg/kg/day with GLP compliance. No adverse reproductive effects were observed in this study. Therefore, the NOAEL for reproductive effects in this study is > 500 mg/kg/day. The adult animal NOAEL is judged to be 200 mg/kg/day based on high dose level body weight decrements, reduced feed consumption, significantly reduced female rat WBC counts and possible liver, kidney and fore stomach effects.

**Aspiration hazard**

No applicable toxicity data. No known significant effects or critical hazards.

**Other information**

No applicable toxicity data. No known significant effects or critical hazards.

<b>SECTION 12: Ecological information</b>
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**Summary of environmental hazards based on the conventional method of Directive 1999/45/EC**

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

**12.1. Toxicity*****EPIKOTE™ Resin MGS RIMR 135***

No applicable toxicity data.

***reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)***

FISH - The acute 96 hr static exposure LC50 for trout based on the results of OECD No. 203 studies is 1.3 mg/L. Daphnia - The acute 48 hr acute static exposure EC50 value for Daphnia based on the outcome of OECD No. 202 studies is 2.1 mg/L. A NOEC of 0.3 mg/L was observed in a Daphnia 21-day semi-static OECD No. 211 Reproduction study. Daphnia survival, growth and reproduction were significantly reduced at concentrations of 1 mg/L and higher. Algae- The 72 hr algal LC50 value is > 11 mg/L. The activated sewage sludge respiration inhibition 3 hr EC50 value based on an EC test method was > 100 mg/L. The growth inhibitory concentration for Pseudomonas in an 18 hr static exposure study was > 42.6 mg/L.

***1,6-bis(2,3-epoxypropoxy)hexane***

Fresh water LC50: 30 mg/l/3 d Rainbow trout, donaldson trout  
 Fresh water EC50: 67 mg/l/1 d Water flea  
 Fresh water EC50: 47 mg/l/2 d Water flea  
 Fresh water LC50: 23.1 mg/l/2 d Algae  
 Fresh water IC50: > 100 mg/l/28 d Soil organisms

The acute toxicity of 1,6 -Hexanediol diglycidylether to rainbow trout was determined in an O.E.C.D. Testing Guideline 203 study conducted under the GLP regulations with concentration and stability verification. The estimated 96 hr LC50 value for 1,6-Hexanediol diglycidylether to rainbow trout was 30 mg/L with 95% Confidence Limits of 25-36 mg/L.

**12.2. Persistence and degradability*****EPIKOTE™ Resin MGS RIMR 135***

No data available.

**reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)**

The level of biodegradation in an "enhanced" OECD 301F study was 5% within the 28 day contact period. Biodegradation reached 6 - 12 % after 28 days of contact in an OECD test guideline no. 301B study. Therefore, BADGE is not readily biodegradable under the conditions of the studies.

**1,6-bis(2,3-epoxypropoxy)hexane**

1,6 -Hexanediol diglycidylether was assessed for ready biodegradability in an O.E.C.D. Testing Guideline 301D Closed Bottle study. The test substance reached a level of biodegradation of approximately 47% within 28 days of treatment under the conditions of the study.

**12.3. Bioaccumulative potential**

**EPIKOTE™ Resin MGS RIMR 135**

No data available.

**reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)**

The OASIS CATALOGIC QSAR estimated Bioconcentration Factor of 3 - 31 and Log Pow of 3.24 @ 25 C suggest low potential to bioaccumulate in aquatic organisms.

**1,6-bis(2,3-epoxypropoxy)hexane**

The QSAR program of Advanced Chemistry Developmental (ACD/Labs) Software V9.04 for Solaris (ACS SciFinder Database September 2009) estimated a Bioconcentration Factor for 1,6 -Hexanediol glycidylether of 3.57.

**12.4. Mobility in soil**

**EPIKOTE™ Resin MGS RIMR 135**

No data available.

**reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)**

The KOCWIN QSAR estimated adsorption/desorption coefficient Log Koc = 2.65 suggesting moderated sorption to organic matter and limited soil mobility.

**1,6-bis(2,3-epoxypropoxy)hexane**

An estimation of the Log Koc for 1,6-Hexanediol Diglycidylether (HDDGE) was made by an O.E.C.D. Testing Guideline No. 121 study with GLP compliance. The Log Koc for 1,6-Hexanediol Diglycidylether (HDDGE) was approximately 2.98 suggesting low potential for adsorption to soil, sewage sludge and sediment.

**12.5. Results of PBT and vPvB assessment**

**EPIKOTE™ Resin MGS RIMR 135**

Based on the substance information, the mixture is not expected to meet the criteria for PBT/vPvB.

**reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)**

Based upon a low potential to bioaccumulate and EC50/LC50 values of > 0.1 mg/L BADGE is not PBT.

**1,6-bis(2,3-epoxypropoxy)hexane**

A detailed analysis of the Persistence, Bioaccumulation and Toxicity has been brought together into a clear conclusion on whether 1,6 -Hexanediol diglycidylether is not a PBT/vPvB substance. 1,6 -Hexanediol diglycidylether is not readily biodegradable under the conditions of the study, however, it is unlikely to meet the P Criteria.. Applicable QSAR results show that 1,6 -Hexanediol diglycidylether is not B. The toxicity studies value is greater than the 0.1 mg/L and does not meet the T criteria. The data show that the properties of the substance do not meet the specific criteria detailed in Annex XIII and, consequently, that the substance is not considered a PBT/vPvB.

**12.6. Other adverse effects**

**EPIKOTE™ Resin MGS RIMR 135**

No known adverse effects.

**reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)**

No known adverse effects.

**1,6-bis(2,3-epoxypropoxy)hexane**

No known adverse effects.

## SECTION 13: Disposal considerations

**13.1. Waste treatment methods**

- Methods of disposal** : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
- Hazardous waste** : The classification of the product may meet the criteria for a hazardous waste.

## SECTION 14: Transport information

Regulatory information	14.1. UN number	14.2. UN proper shipping name	14.3. Transport hazard class(es)	14.4. Packing group

<b>ADR</b>	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (EPOXIDE DERIVATIVES)	9	III
<b>RID</b>	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (EPOXIDE DERIVATIVES)	9	III
<b>ICAO/IATA</b>	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (EPOXIDE DERIVATIVES)	9	III
<b>IMO/IMDG</b>	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (EPOXIDE DERIVATIVES)	9	III

**14.5. Environmental hazards**

Environmentally hazardous and/or Marine Pollutant : Yes.

**14.6. Special precautions for user**

Not applicable.

**14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**

Not applicable.

<b>SECTION 15: Regulatory information</b>
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**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****EU regulations**

<b>SEVESO Directive 96/82/EC</b>	:	<b><u>Ingredient name</u></b>	<b><u>Listed</u></b>
		<i>reaction product:</i>	yes
		<i>bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight &lt;= 700)</i>	
		<i>1,6-bis(2,3-epoxypropoxy)hexane</i>	No.

REACH Annex XVII :

Biocides - Annex I to Directive 98/8/EC : Not listed

Prior Informed Consent. List of chemicals subject to the international PIC procedure (Part I, II, III) : Not listed

Integrated pollution prevention and control list (IPPC) - Air : Not listed



**Integrated pollution prevention and control list (IPPC) - Water** : Not listed

### International regulations

**Chemical inventories** REACH Status The substance(s) in this product has (have) been Pre-Registered and/or Registered, or are exempted from registration, according to Regulation (EC) No. 1907/2006 (REACH).  
 Australia inventory (AICS) All components are listed or exempted.  
 Canada inventory All components are listed or exempted.  
 Japan inventory All components are listed or exempted.  
 China inventory (IECSC) All components are listed or exempted.  
 Korea inventory All components are listed or exempted.  
 New Zealand Inventory (NZIoC) Not determined.  
 Philippines inventory (PICCS) All components are listed or exempted.  
 United States inventory (TSCA 8b) All components are listed or exempted.

### 15.2. Chemical Safety Assessment

Chemical Safety Assessment not applicable.

## **SECTION 16: Other information**

The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

**Full text of abbreviated H statements** : H411 - Toxic to aquatic life with long lasting effects.  
 H317 - May cause an allergic skin reaction.  
 H315 - Causes skin irritation.  
 H319 - Causes serious eye irritation.  
 H412 - Harmful to aquatic life with long lasting effects.  
 H319 - Causes serious eye irritation.  
 H315 - Causes skin irritation.  
 H317 - May cause an allergic skin reaction.

**Full text of classifications (CLP)** : AQUATIC TOXICITY (CHRONIC) Category 2 - H411  
 SKIN SENSITIZATION Category 1 - H317  
 SKIN CORROSION/IRRITATION Category 2 - H315  
 SERIOUS EYE DAMAGE/ EYE IRRITATION Category 2 - H319  
 AQUATIC TOXICITY (CHRONIC) Category 3 - H412  
 SERIOUS EYE DAMAGE/ EYE IRRITATION Category 2 - H319  
 SKIN CORROSION/IRRITATION Category 2 - H315  
 SKIN SENSITIZATION Category 1 - H317

**Full text of abbreviated R phrases** : R36/38- Irritating to eyes and skin.  
 R43- May cause sensitization by skin contact.  
 R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.  
 R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Full text of classification (DSD/DPD)** : Xi Irritant  
 N Dangerous for the environment.

**Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II**

### History

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