Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Commission Regulation (EU) 2020/878

SAFETY DATA SHEET

FOR PROFESSIONAL and/or INDUSTRIAL USE ONLY

EPIKOTE™ RESIN MGS DFR20

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name	:	EPIKOTE™ RESIN MGS DFR20
SDS Number	:	300000034535
Product type	:	Epoxy Resin
Other means of identification	:	UFI: 8CKH-D7YM-MYD7-H89U

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses
Not applicable.

Uses advised against
Not applicable.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier/Importer	:	Westlake Epoxy B.V. Seattleweg 17 3195 ND Pernis - Rotterdam The Netherlands
Contact person	:	epoxyservice@westlake.com
Telephone	:	General information +31 (0) 10 295 4011

1.4 Emergency telephone number

Supplier	:	CARECHEM24
Telephone number	:	+44 (0) 1235 239 670

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Skin Corr./Irrit. 2 H315
Eye Dam./Irrit. 2 H319
Skin Sens. 1 H317
Aquatic Chronic 2 H411

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

2.2 Label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
Toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention : Wear protective gloves.
Wear eye or face protection.
Avoid release to the environment.
Avoid breathing vapor.
Wash thoroughly after handling.

Response : Collect spillage.
Take off contaminated clothing and wash it before reuse.
IF ON SKIN:
Wash with plenty of water.
If skin irritation or rash occurs:
Get medical advice or attention.
IF IN EYES:
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists:
Get medical advice or attention.

Storage : Not applicable.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous ingredients : bis-[4-(2,3-epoxipropoxi)phenyl]propane
Bisphenol F diglycidyl ether, reaction mass of isomers
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.

Supplemental label elements : Not applicable.

2.3 Other hazards

Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII : Not applicable.

Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII : Not applicable.

Other hazards which do not result in classification : None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	%	Classification	Specific Conc. Limits, M-factors and ATEs	Type
bis-[4-(2,3-epoxipropoxi)phenyl]propane	RRN : 01-2119456619-26 EC : 216-823-5 CAS : 1675-54-3 Index : 603-073-00-2	>= 50 - <= 75	Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317 Aquatic Chronic 2, H411	Skin Irrit. 2, H315: >= 5 % Eye Irrit. 2, H319: >= 5 %	[1]
Bisphenol F diglycidyl ether, reaction mass of isomers	RRN : 01-2119454392-40 EC : 701-263-0	>= 10 - <= 25	Skin Irrit. 2, H315 Skin Sens. 1A, H317 Aquatic Chronic 2, H411	-	[1]
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	RRN : 01-2119485289-22 EC : 271-846-8 CAS : 68609-97-2 Index : 603-103-00-4	> 0 - <= 5	Skin Irrit. 2, H315 Skin Sens. 1, H317	-	[1]

See Section 16 for the full text of the H statements declared above.
There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section.

Type
Substance classified with a health or environmental hazard
[1] Substance classified with a health or environmental hazard

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

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.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. Get medical attention if adverse health effects persist or are severe. 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 : Wash with plenty of soap and 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.

Ingestion : Wash out mouth with water. Remove dentures if any. 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.

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.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.
Inhalation : No known significant effects or critical hazards.
Skin contact : Causes skin irritation. May cause an allergic skin reaction.
Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use dry chemical, CO2, alcohol-resistant foam or water spray (fog).
Unsuitable extinguishing media : Do not use water jet.

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. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained

and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
halogenated compounds

5.3 Advice for firefighters

Special protective actions 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.

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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

Additional information : Not available

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : 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.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

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. Collect spillage.

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. Alternatively, or if water-insoluble, 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. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product.

6.4 Reference to other sections

: See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.

See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures	:	Put on appropriate personal protective equipment (see section 8 of SDS). 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. 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.
Advice on general occupational hygiene	:	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. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

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 of SDS) 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.

7.3 Specific end use(s)

Recommendations	:	Not available
Industrial sector specific solutions	:	Not available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

No exposure limit value known.

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 monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
bis-[4-(2,3-epoxipropoxi)phenyl]propane	DNEL	Short term Dermal	8.3 mg/kg bw/day	Workers	Systemic
bis-[4-(2,3-epoxipropoxi)phenyl]propane	DNEL	Short term Inhalation	12.3 mg/m³	Workers	Systemic
bis-[4-(2,3-epoxipropoxi)phenyl]propane	DNEL	Long term Dermal	8.3 mg/kg bw/day	Workers	Systemic
bis-[4-(2,3-epoxipropoxi)phenyl]propane	DNEL	Long term Inhalation	12.3 mg/m³	Workers	Systemic
bis-[4-(2,3-epoxipropoxi)phenyl]propane	DNEL	Short term Dermal	3.6 mg/kg bw/day	General population	Systemic
bis-[4-(2,3-epoxipropoxi)phenyl]propane	DNEL	Short term Inhalation	0.75 mg/m³	General population	Systemic
bis-[4-(2,3-epoxipropoxi)phenyl]propane	DNEL	Short term Oral	0.75 mg/kg bw/day	General population	Systemic
bis-[4-(2,3-epoxipropoxi)phenyl]propane	DNEL	Long term Dermal	3.6 mg/kg bw/day	General population	Systemic
bis-[4-(2,3-epoxipropoxi)phenyl]propane	DNEL	Long term Inhalation	0.75 mg/m³	General population	Systemic
bis-[4-(2,3-epoxipropoxi)phenyl]propane	DNEL	Long term Oral	0.75 mg/kg bw/day	General population	Systemic
Bisphenol F diglycidyl ether, reaction mass of isomers	DNEL	Short term Dermal	8.3 µg/cm²	Workers	Local
Bisphenol F diglycidyl ether, reaction mass of isomers	DNEL	Long term Dermal	104.15 mg/kg bw/day	Workers	Systemic
Bisphenol F diglycidyl ether, reaction mass of isomers	DNEL	Long term Inhalation	29.39 mg/m³	Workers	Systemic
Bisphenol F diglycidyl ether, reaction mass of isomers	DNEL	Long term Dermal	62.5 mg/kg bw/day	General population	Systemic
Bisphenol F diglycidyl ether, reaction mass of isomers	DNEL	Long term Inhalation	8.7 mg/m³	General population	Systemic
Bisphenol F diglycidyl ether, reaction mass of isomers	DNEL	Long term Oral	6.25 mg/kg bw/day	General population	Systemic

oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	DNEL	Long term Inhalation	3.6 mg/m³	Workers	Systemic
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	DNEL	Long term Inhalation	0.87 mg/m³	General population	Systemic
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	DNEL	Long term Dermal	1.0 mg/kg bw/day	Workers	Systemic
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	DNEL	Long term Dermal	0.5 mg/kg bw/day	General population	Systemic
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	DNEL	Long term Oral	0.5 mg/kg bw/day	General population	Systemic

DNEL/DMEL Summary **:** Not available

PNECs

Product/ingredient name	Type	Compartment Detail	Value	Method Detail
bis-[4-(2,3-epoxipropoxi)phenyl]propane	PNEC	Fresh water	6 µg/l	
bis-[4-(2,3-epoxipropoxi)phenyl]propane	PNEC	Marine	1 µg/l	
bis-[4-(2,3-epoxipropoxi)phenyl]propane	PNEC	Sewage Treatment Plant	10 mg/l	
bis-[4-(2,3-epoxipropoxi)phenyl]propane	PNEC	Fresh water sediment	0.341 mg/kg dwt	
bis-[4-(2,3-epoxipropoxi)phenyl]propane	PNEC	Marine water sediment	0.034 mg/kg dwt	
bis-[4-(2,3-epoxipropoxi)phenyl]propane	PNEC	Soil	0.065 mg/kg dwt	
Bisphenol F diglycidyl ether, reaction mass of isomers	PNEC	Fresh water	0.003 mg/l	
Bisphenol F diglycidyl ether, reaction mass of isomers	PNEC	Marine	0.0003 mg/l	
Bisphenol F diglycidyl ether, reaction mass of isomers	PNEC	Sewage Treatment Plant	10 mg/l	
Bisphenol F diglycidyl ether, reaction mass of isomers	PNEC	Fresh water sediment	0.294 mg/kg dwt	
Bisphenol F diglycidyl ether, reaction mass of isomers	PNEC	Marine water sediment	0.0294 mg/kg dw	
Bisphenol F diglycidyl	PNEC	Soil	0.237 mg/kg dwt	

ether, reaction mass of isomers				
Bisphenol F diglycidyl ether, reaction mass of isomers	PNEC	Intermittent Releases	0.0254 mg/l	
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	PNEC	Fresh water	0.0072 mg/l	
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	PNEC	Marine	0.72 µg/l	
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	PNEC	Sewage Treatment Plant	10 mg/l	
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	PNEC	Fresh water sediment	307.16 mg/kg dv	
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	PNEC	Marine water sediment	30.716 mg/kg dv	
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	PNEC	Soil	61.42 mg/kg dwt	

PNEC Summary : Not available

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.

8.2 Exposure controls

Appropriate engineering 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.

Individual protection measures

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. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face 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, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection	:	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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
Body 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.
Other skin protection	:	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	:	Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.
Environmental exposure controls	:	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	:	Liquid
Color	:	Not available (not measured)
Odor	:	Not available (not measured)
Odor threshold	:	Not available (not measured)
pH	:	Not available (not measured)
Melting point/freezing point	:	Not available (not measured)
Initial boiling point and boiling range	:	Not available (not measured)
Flash point	:	Not available (not measured)
Evaporation rate	:	Not available (not measured)
Upper/lower flammability or explosive limits	:	**Lower:** Not available (not measured) **Upper:** Not available (not measured)
Vapor pressure	:	Not available (not measured)
Vapor density	:	Not available (not measured)
Relative density	:	Not available (not measured)
Solubility(ies)	:	Not available (not measured)
Solubility in water	:	Not available (not measured)
Partition coefficient: n-octanol/water	:	Not applicable.
Auto-ignition temperature	:	Not available (not measured)
Decomposition temperature	:	Not available (not measured)
Viscosity	:	**Dynamic:** Not available (not measured) **Kinematic:** Not available (not measured)
Explosive properties	:	Not available (not measured)
Oxidizing properties	:	Not available (not measured)

Particle characteristics

Median particle size : Not applicable.

9.2 Other information
No additional information.

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 : No specific data.

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

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
bis-[4-(2,3-epoxipropoxi)phenyl]propane				
	LD50 Oral	Rat	11,400 mg/kg	-
Remarks - Oral:	Not acutely toxic in multiple mouse and rat studies, LD50 > 2000 mg/kg of body weight.			
	LD50 Oral	Rat	11,400 mg/kg	-
Remarks - Inhalation:	Due to the very low vapor pressure, saturated atmosphere = 0.008 ppb, meaningful acute inhalation studies could not be conducted.			
Remarks - Dermal:	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.			
	LD50 Dermal	Rat	2,000 mg/kg	-
	LD50 Dermal	Rat	2,000 mg/kg	-
Bisphenol F diglycidyl ether, reaction mass of isomers				
	LD50 Oral	Rat	> 2,000 mg/kg	-
Remarks - Oral:	The acute oral median lethal dose (LD50) in the Fischer 344 strain rat was found to be greater than 2000 mg/kg bodyweight.			
	LD50 Oral	Rat	> 2,000 mg/kg	-
Remarks - Inhalation:	In accordance with REACH Annex VII, the acute inhalation study does not need to be conducted as oral and dermal studies are available for this substance.			
	LD50 Dermal	Rabbit	> 2,000 mg/kg	-
	LD50 Dermal	Rabbit	> 2,000 mg/kg	-
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.				
	LD50 Oral	Rat	17,100 mg/kg	-

	LD50 Oral	Rat	26,800 mg/kg	-
	LD50 Oral	Rat	17,100 mg/kg	-
	LD50 Dermal	Rabbit	> 4,000 mg/kg	-
	LD50 Dermal	Rabbit	> 4,000 mg/kg	-

Conclusion/Summary : Not available

Acute toxicity estimates

Product/ingredient name	Oral	Dermal	Inhalation (gases)	Inhalation (vapors)	Inhalation (dusts and mists)
bis-[4-(2,3-epoxipropoxi)phenyl]propane	11,400 mg/kg	N/A	N/A	N/A	N/A
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	17,100 mg/kg	N/A	N/A	N/A	N/A

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
bis-[4-(2,3-epoxipropoxi)phenyl]propane	Skin - Erythema/Eschar 404 Acute Dermal Irritation/Corrosion	Rabbit	1.5 - 2		-
	Skin - Edema 404 Acute Dermal Irritation/Corrosion	Rabbit	1.0 - 1.5		-
	eyes - - 405 Acute Eye Irritation/Corrosion	Rabbit	0		-
	eyes - Redness of the conjunctivae	Rabbit	0.7		-
	Skin - Moderate irritant	Rabbit	-	24 hrs	-
	Skin - Severe irritant	Rabbit	-	24 hrs	-
	eyes - Mild irritant	Rabbit	-		-
Bisphenol F diglycidyl ether, reaction mass of isomers	Skin - Erythema/Eschar 404 Acute Dermal Irritation/Corrosion	Rabbit	0.7	4 hrs	72 hrs
	Skin - Edema 404 Acute Dermal Irritation/Corrosion	Rabbit	0	4 hrs	4 - 504 hrs
	eyes - Cornea opacity 405 Acute Eye Irritation/Corrosion	Rabbit	0		1 - 168 hrs
	eyes - Iris lesion 405 Acute Eye Irritation/Corrosion	Rabbit	0		1 - 168 hrs
	eyes - Redness of the conjunctivae 405 Acute Eye Irritation/Corrosion	Rabbit	0		1 - 168 hrs
	eyes - Edema of	Rabbit	0		1 - 168 hrs

	the conjunctivae 405 Acute Eye Irritation/Corrosion				
	Skin - Mild irritant	Rabbit	-	24 hrs	-
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	Skin - Primary dermal irritation index (PDII) OTS 798.4470 Acute Dermal Irritation	Rabbit	4.1	24 hrs	72 hrs
	Skin - Primary dermal irritation index (PDII) 404 Acute Dermal Irritation/Corrosion	Rabbit	5.75	24 hrs	72 hrs
	eyes - Cornea opacity 405 Acute Eye Irritation/Corrosion	Rabbit	2		1 - 24 hrs
	Skin - Moderate irritant	Rabbit	-	24 hrs	-

Conclusion/Summary

Skin : Not available
eyes : Not available
Respiratory : Not available

Sensitization

Product/ingredient name	Route of exposure	Species	Result
bis-[4-(2,3-epoxipropoxi)phenyl]propane	Skin	See Remarks	Sensitizing
Remarks:	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.		
Bisphenol F diglycidyl ether, reaction mass of isomers	Skin	Guinea pig	Sensitizing
Remarks:	The Buehler method was employed to evaluate the dermal sensitization potential of Liquid BPFDGE Epoxy Resin. Ten male guinea pigs received 0.4 ml of test substance topically once a week for three weeks. A positive control of Liquid BPFDGE Epoxy Resin was used on ten additional animals. The challenge phase began two weeks later with an addition 5 animals exposed to 0.4 ml of Liquid BPFDGE Epoxy Resin. The negative control had 0 positive reactions; the Liquid BPFDGE Epoxy Resin had 4 of 10 with positive reactions and the positive control had 8 of ten positive reactions. Under the conditions of this study, the test material caused delayed hypersensitivity in guinea pigs.		
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	Skin	Guinea pig	Sensitizing
Remarks:	Sensitizing in a U.S. E.P.A. OTS test guideline no. 870.2600 Buehler method study demonstrating positive dermal reactions in 20/20 guinea pigs. An extreme sensitizer in an O.E.C.D. test guideline no. 406 guinea pig Maximization study.		
	Skin	Guinea pig	Sensitizing OECD Test Guideline 406

Conclusion/Summary

Skin : Not available

Respiratory : Not available

Mutagenicity

Product/ingredient name	Test	Experiment	Result
bis-[4-(2,3-epoxipropoxi)phenyl]propane	-	Subject: See Remarks	Positive
Remarks:	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.		
	-	Subject: Mammalian-Animal	Negative
Remarks:	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.		
Bisphenol F diglycidyl ether, reaction mass of isomers	-	Subject: See Remarks Experiment: In vitro	Positive
Remarks:	Bisphenol F Diglycidylether induced gene-mutation in the Ames/Salmonella mutation test and chromosomal aberrations in human lymphocytes in multiple independent testing guideline GLP studies. Furthermore, the structural analog, Bisphenol A Diglycidylether (BPADGE) induce a significant increase of the mutant frequency in L5178Y mouse lymphoma cells in culture supporting the other findings. Therefore, BPFDGE is genotoxic in vitro.		
	-	Subject: Mammalian-Animal Experiment: In vivo	Negative
Remarks:	When Bisphenol F Diglycidylether was evaluated for genotoxicity potential in multiple GLP in vivo assays including the mouse micronucleus, rat in vivo/in vitro UDS and MutaMouse tests no evidence of genotoxicity was observed. The results of other in vivo tests for genotoxicity also supported these negative findings for BPFDGE. Therefore, Bisphenol F Diglycidylether is not genotoxic in vivo.		
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	OECD-Guideline 471 (Genetic Toxicology: Salmonella typhimurium, Reverse Mutation Assay)	Subject: Bacteria Experiment: In vitro	Positive
Remarks:	Positive in an O.E.C.D. test guideline no. 471 bacterial mutation assay in Salmonella tester strain TA1535 with and without S9 metabolic activation. Negative in an O.E.C.D. test guideline no. 476 Chinese hamster ovary cell (CHO) HGPRT gene-mutation assay conducted up to cytotoxic does levels with and without S9 metabolic activation. Negative in a L5178Y mouse lymphoma cell TK gene-mutation assay tested up to cytotoxic dose levels.		
	474 Mammalian Erythrocyte Micronucleus Test	Subject: Mammalian-Animal Experiment: In vivo	Negative
Remarks:	Negative for micronucleus (chromosome damage) induction in an O.E.C.D. test guideline no. 474 mouse study conducted up to a high I.P. injection dose of 4.0 grams/kg. Negative in a rat bone marrow chromosome aberration study conducted in a manner similar to O.E.C.D. test guideline no. 475 by I.P.		

	injection up to a high dose of approximately 700 mg/kg.		
	476 In vitro Mammalian Cell Gene Mutation Test	Subject: Mammalian-Animal Experiment: In vitro	Negative
	479 Genetic Toxicology: In vitro Sister Chromatid Exchange Assay in Mammalian Cells	Subject: Mammalian-Animal Experiment: In vitro	Negative
	475 Mammalian Bone Marrow Chromosomal Aberration Test	Subject: Mammalian-Animal Experiment: In vitro	Negative

Conclusion/Summary : Not available

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
bis-[4-(2,3-epoxipropoxi)phenyl]propane	Negative - Unreported - NOEL	See Remarks		
Remarks:	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.			
Bisphenol F diglycidyl ether, reaction mass of isomers	Negative - Dermal - NOEL	Mouse		
Remarks:	Bisphenol F Diglycidylether (BPFDGE) was evaluated for the potential to induce local and systemic tumors in a mouse skin-painting 24 month study. Dermal treatment of mice twice a week with up to a 10% solution of Bisphenol F Diglycidylether (BPFDGE) did not induce any adverse findings of tumor incidence or local dermal effects. Therefore, BPFDGE is not a mouse carcinogen under the conditions of this study. The NOAEL was estimated to be approximately 800 mg/kg/day.			

Conclusion/Summary : Not available

Reproductive toxicity

Conclusion/Summary : Not available

Teratogenicity

Product/ingredient name	Result	Species	Dose	Exposure
bis-[4-(2,3-epoxipropoxi)phenyl]propane	Negative - Oral	Rabbit	-	-
Remarks:	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 base on decreased body weight gain. The rabbit dermal study was conduced up to a high dose of 300 mg/kg/day that induced maternal toxicity based on reduced body weight gain.			
Bisphenol F diglycidyl ether, reaction mass of isomers	Negative - Dermal	Rabbit	-	-
Remarks:	Diglycidyl ether of bisphenol A (DGEBPA) was tested for its embryo/fetal toxicity and teratogenicity in pregnant rabbits. DGEBPA was applied daily to the backs (clipped free of hair) of New Zealand White rabbits at dose levels of 0			

	(polyethylene glycol, vehicle control), 30, 100 or 300 mg/kg body weight/day at a dose volume of 1 ml/kg body weight/day on days 6 through 18 of gestation. Twenty six inseminated rabbits were used per dose group resulting in a minimum of 20 pregnant rabbits per exposure level. An occlusive bandage of absorbent gauze and non-absorbent cotton was placed over the dosing area on the back of each rabbit. The bandage was held in place for a minimum of 6 hours/day using a lycra/spandex jacket. Following the occlusion period the bandage and jacket were removed. Maternal toxicity was observed among pregnant rabbits in the 300 mg/kg dose group as evidenced by moderate to severe erythema, fissures, hemorrhage and slight edema at the exposure site. Similar, but less severe skin lesions were observed in pregnant rabbits in the 100 mg/kg/day exposure group. Skin effects (slight erythema) observed in pregnant rabbits in the 30 mg/kg/day dose group were not considered toxicicologically significant. No evidence of embryo/fetal toxicity or teratogenicity was observed at any dose level resulting in a embryo/fetal no-observed-effect level of 300 mg/kg body weight/day.			
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	Negative - Dermal OECD Test Guideline 414	Rat	-	-
Remarks:	In a U.S. E.P. A. OTS 798.4420 and O.E.C.D. test guideline no. 414 developmental toxicity study conducted by the dermal route in the rat, the NOAEL for both maternal and developmental adverse effects was greater than the high dose level of 200 mg/kg/day.			

Conclusion/Summary : Not available

Specific target organ toxicity (single exposure)

Not available

Specific target organ toxicity (repeated exposure)

Not available

Aspiration hazard

Not available

Information on likely routes of exposure : Not available

Potential acute health effects

Eye contact : Causes serious eye irritation.
Inhalation : No known significant effects or critical hazards.
Skin contact : Causes skin irritation. May cause an allergic skin reaction.
Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following: pain or irritation, watering, redness
Inhalation : No specific data.
Skin contact : Adverse symptoms may include the following: irritation, redness
Ingestion : No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available
Potential delayed effects : Not available

Long term exposure

Potential immediate effects : Not available
Potential delayed effects : Not available

Potential chronic health effects

Product/ingredient name	Result	Species	Dose	Exposure
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	NOAEL Dermal	Rat	1 mg/kg/d Repeated dose 411 Subchronic Dermal Toxicity: 90-day Study	90 days Repeated dose; 5 days per week Repeated dose

Conclusion/Summary : Not available

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Reproductive toxicity : No known significant effects or critical hazards.

11.2. Information on other hazards

11.2.1 Endocrine disrupting properties : Not available
11.2.2 Other information : Not available

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
bis-[4-(2,3-epoxipropoxi)phenyl]propane			
	Acute LC50 1.3 mg/l - 203 Fish, Acute Toxicity Test	Fish	96 h
	Acute LC50 1.3 mg/l 203 Fish, Acute Toxicity Test	Fish	96 h
	Acute EC50 2.1 mg/l - 202 Daphnia sp. Acute Immobilization Test and Reproduction Test	Water flea	48 h
	Acute LC50 > 11 mg/l -	Algae	72 h
	Acute LC50 > 11 mg/l	Algae	72 h
	Chronic No-observable-effect-concentration 0.3 mg/l semi-static test 211 Daphnia Magna Reproduction Test	Water flea	21 d
Bisphenol F diglycidyl ether, reaction mass of isomers			
	Acute LC50 2.54 mg/l -	Fish	96 h
	Acute LC50 2.54 mg/l	Fish	96 h
	Acute EC50 2.55 mg/l - 202 Daphnia sp. Acute Immobilization Test and Reproduction Test	Water flea	48 h
	Acute EC50 > 1,000 mg/l - 201 Alga, Growth Inhibition Test	Algae	72 h
	Acute EC50 > 1,000 mg/l 201 Alga, Growth Inhibition Test	Algae	72 h
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.			
	Acute LC50 > 1.8 g/l - 203	Rainbow trout,donaldson	96 h

	Fish, Acute Toxicity Test	trout	
	Acute LC50 > 5.0 g/l - 203 Fish, Acute Toxicity Test	Bluegill	96 h
	Acute LC50 > 100.0 mg/l - 203 Fish, Acute Toxicity Test	Rainbow trout,donaldson trout	96 h
	Acute EC50 7.2 mg/l - 202 Daphnia sp. Acute Immobilization Test and Reproduction Test	Water flea	48 h
	Acute EC50 844 mg/l - 201 Alga, Growth Inhibition Test	Algae	72 h
	Acute EC50 844 mg/l 201 Alga, Growth Inhibition Test	Algae	72 h
	Acute EC50 > 100 mg/l Fresh water OECD-Guideline No. 209	activated sludge, domestic (adaptation not specified)	3 h

Conclusion/Summary : Not available

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
bis-[4-(2,3-epoxipropoxi)phenyl]propane	OECD-Guideline 301 F (Manometric Respirometry Test)	6 - 12 % - No biodegradation - 28 d	-	Activated sludge
Remarks:	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.			
Bisphenol F diglycidyl ether, reaction mass of isomers	OECD-Guideline 301 B (CO2 Evolution Test)	16 % - No biodegradation - 28 d	10 mg/l	Activated sludge
Remarks:	Bisphenol F Diglycidylether was not readily biodegradable under the conditions of the O.E.C.D. 301 B and 301 D screening studies. The maximum percent biodegradation observed in one of the O.E.C.D. 301 B studies was 16% for 10 mg/L at 28 days of contact.			
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	OECD-Guideline 301 F (Manometric Respirometry Test)	87 % - Readily biodegradable - 28 d	-	Activated sludge

Conclusion/Summary : Not available

12.3 Bioaccumulative potential

Product/ingredient name	LogPow	BCF	Potential
bis-[4-(2,3-epoxipropoxi)phenyl]propane	2.64 - 3.78	3 - 31 31.00	low
Bisphenol F diglycidyl ether, reaction mass of isomers	3.3	150 150.00	low
oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	3.77	160 - 263 160.00	low

12.4 Mobility in soil

Soil/water partition coefficient (KOC)	:	Not available
Mobility	:	Not available

12.5 Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

12.6 Endocrine disrupting properties : Not available

12.7 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal	:	The generation of waste should be avoided or minimized wherever possible. 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. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.
Hazardous waste	:	The classification of the product may meet the criteria for a hazardous waste.

Packaging

Methods of disposal	:	The generation of waste should be avoided or minimized wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.
Special precautions	:	This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

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
ADR/ADN	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (EPOXIDE DERIVATIVES)	9	III
RID	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (EPOXIDE DERIVATIVES)	9	III

ICAO/IATA	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (EPOXIDE DERIVATIVES)	9	III
IMO/IMDG	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 : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Maritime transport in bulk according to IMO instruments : Not available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorization

Annex XIV

None required.

Substances of very high concern

None required.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Other EU regulations

REACH Status : The substance(s) in this product has (have) been Registered, or are exempted from registration, according to Regulation (EC) No. 1907/2006 (REACH).

Prior Informed Consent (PIC) (649/2012/EU)

None required.

Seveso Directive

This product is controlled under the Seveso Directive.

Danger criteria

Category
E2

National regulations

Storage class (TRGS 510) : 12

Hazardous incident ordinance

This product is controlled under the Germany Hazardous Incident Ordinance.

Danger criteria

Category	Reference number
E2	

Hazard class for water : WGK 2

Technical instruction on air quality control : TA-Luft Number 5.2.5: 74 %
TA-Luft Number 5.2.5: Class I - 20.7 %

AOX : The product contains organically bound halogens and can contribute to the AOX value in waste water.

International regulations

International lists : 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 (KECI) All components are listed or exempted.
New Zealand Inventory (NZIoC) All components are listed or exempted.
Philippines inventory (PICCS) All components are listed or exempted.
Taiwan inventory (TCSI) All components are listed or exempted.
Thailand inventory Not determined.
United States inventory (TSCA 8b) All components are active or exempted.
Vietnam inventory Not determined.

15.2 Chemical Safety Assessment : This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
N/A = Not available
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
SGG = Segregation Group
vPvB = Very Persistent and Very Bioaccumulative

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification

Skin Irrit. 2, H315	Calculation method
Eye Irrit. 2, H319	Calculation method
Skin Sens. 1, H317	Calculation method
Aquatic Chronic 2, H411	Calculation method

Full text of abbreviated H statements

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H411	Toxic to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS]

Aquatic Chronic 2	AQUATIC HAZARD (LONG-TERM) - Category 2
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2
Skin Sens. 1	SKIN SENSITISATION - Category 1
Skin Irrit. 2	SKIN CORROSION/IRRITATION
Skin Sens. 1	SKIN SENSITISATION
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION
Aquatic Chronic 2	AQUATIC HAZARD (LONG-TERM)

Date of printing : 06.03.2024
Date of issue/ Date of revision : 30.05.2023
Date of previous issue : 04.01.2023
Version : 5.0

Notice to reader

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.