



Safety Data Sheet

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

EPON(TM) Resin 828

Revision Date 06-JUN-2011

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

1.1. Product identifier

Product name	EPON(TM) Resin 828
SDS Number	K122K_EU
Substance name	reaction product: bisphenol-A-(epichlorhydrin); epoxy resin (number average molecular weight $\leq$ 700)
Registration number	01-2119456619-26-0002
EC number	500-033-5
CAS number	25068-38-6
Product Type	Epoxy Resin

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

Industrial use

Identified use	Process Category (PROC)	Sector of Use (SU)	Environmental Release Category (ERC)*
ES BADGE 1.1S			
Industrial manufacturing including synthesis of the substance and blending, or use as an intermediate or monomer in reactions by the manufacturer or DU.	PROC 1 PROC 2 PROC 3	SU 3 SU 8 SU 9 SU 11 SU 12	mERC 1.1 mERC 1.2
ES BADGE 1.2S			
Industrial manufacturing including synthesis of the substance and blending, or use as an intermediate or monomer in reactions by the manufacturer or DU.	PROC 4 PROC 8a PROC 8b PROC 9	SU 3 SU 8 SU 9 SU 11 SU 12	mERC 1.1 mERC 1.2
ES BADGE 2.1S			
Industrial processes for blending or formulation into a mixture, and packaging of the product or mixtures, including transfers of material or mixtures between vessels, containers and/or shipping tanks. This includes dedicated as well as non-dedicated facilities. This ES covers the activities of most or all of our direct customer DU's.	PROC 5 PROC 8a PROC 8b	SU 3 SU 10	mERC 1.2
ES BADGE 3.1S			

Industrial processes for use and end use in manufacture of an article or finished product, including mixtures and formulations. This includes also blending or formulation into a mixture, and packaging of the product or mixtures as well as packaging into small containers for whole sale or retail sales, including transfers of material or mixtures between vessels, containers and/or shipping tanks for both dedicated and non-dedicated facilities.	PROC 5	SU 1	mERC 1.2
	PROC 6	SU 2a	
	PROC 7	SU 2b	
	PROC 8a	SU 3	
	PROC 8b	SU 5	
	PROC 9	SU 6a	
	PROC 10	SU 6b	
	PROC 13	SU 7	
	PROC 14	SU 8	
	PROC 15	SU 9	
	PROC 16	SU 10	
	PROC 19	SU 11	
		SU 12	
		SU 13	
		SU 15	
		SU 16	
		SU 17	
		SU 18	
		SU 19	
		SU 23	
		SU 24	

Professional use

Identified use	Process Category (PROC)	Sector of Use (SU)	Environmental Release Category (ERC)*
ES BADGE 3.2S			
Professional uses and end uses of an article or product, including mixtures, formulations and transfers of material or mixtures between containers and packaging into containers for whole sale or retail sales.	PROC 5	SU 1	mERC 1.2
	PROC 6	SU 5	
	PROC 8a	SU 6a	
	PROC 8b	SU 6b	
	PROC 9	SU 7	
	PROC 10	SU 8	
	PROC 11	SU 9	
	PROC 13	SU 10	
	PROC 14	SU 11	
	PROC 15	SU 12	
	PROC 16	SU 13	
	PROC 19	SU 15	
	PROC 20	SU 16	
		SU 17	
		SU 18	
		SU 19	
		SU 22	
		SU 24	

The Enviromental Release Category also includes mERC (modified ERC) and spERC (specific ERC)

See Section 16 for the full text of the PROCs, SUs and ERCs declared above.

1.3. Details of the supplier of the safety data sheet

Manufacturer, importer, supplier : Hexion Inc.
180 East Broad Street
Columbus, Ohio
43215 USA

Contact person : 4information@momentive.com

Telephone : **General Information:**
(832) 486-6700(614)225-4778

REACH Reg. Legal Entity : Momentive Specialty Chemicals B.V.
 Seattleweg 17, Building 4,
 3195 ND Pernis - Rotterdam, Netherlands

1.4. Emergency telephone number

: **Emergency telephone:**
 CHEMTREC US Domestic (800) 424-9300
 CHEMTREC International (703) 527-3887

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

<u>Hazard Class</u>	<u>Category</u>	<u>Hazard statement Code(s)</u>
Aquatic Chronic	Category 2	H411
Skin Sens.	Category 1	H317
Skin Corr./Irrit.	Category 2	H315
Eye Dam./Irrit.	Category 2	H319

Classification according to Directive 67/548/EEC (DSD)

The product is classified as dangerous according to Directive 67/548/EEC and its amendments.

Classification : N, R51/53
 R43
 Xi, R36/38

Adverse effects

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

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

2.2. Label elements

Hazard pictograms



Signal word

: Warning

Hazard statements

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

Precautionary statements

Prevention

Wear protective gloves. Wear eye/face protection. Avoid release to the environment. Avoid breathing vapor. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Response

Collect spillage. **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/attention.
IF ON SKIN: Take off contaminated clothing and wash before re-use. Wash with plenty of soap and water. If skin irritation or rash occurs, seek medical advice/attention.

Disposal

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

2.3. Other hazards

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.

SECTION 3: Composition/information on ingredients

Substance/mixture : Mono-constituent substance

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	100
		Aquatic Chronic 2 Skin Sens. 1 Skin Corr./Irrit. 2 Eye Dam./Irrit. 2	H411 H317 H315 H319	

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. 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.

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

- : Wash contaminated skin with 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.

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 known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Skin : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Eyes : No known significant effects or critical hazards.

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 water spray, fog or foam.

Not suitable : 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 : No specific data.

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.

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

Please check the ES Annex for additional recommendations to the identified uses.

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. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8). Avoid breathing vapor or mist.

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** : Move containers from spill area. Dispose of via a licensed waste disposal contractor. Stop leak if without risk. 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.
- Large spill** : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal. Stop leak if without risk. 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). Contaminated absorbent material may pose the same hazard as the spilled product.

SECTION 7: Handling and storage

Please check the ES Annex for additional recommendations to the identified uses.

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. 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.

7.3. Specific end use(s)

Not applicable.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters**Exposure limit values****Ingredient name****Occupational exposure limits****Europe**

No exposure limit value known.

Sweden

No exposure limit value known.

Denmark

No exposure limit value known.

Norway

No exposure limit value known.

France

No exposure limit value known.

Netherlands

No exposure limit value known.

Germany

No exposure limit value known.

Finland

No exposure limit value known.

United Kingdom (UK)

No exposure limit value known.

Austria

No exposure limit value known.

Switzerland

No exposure limit value known.

Belgium

No exposure limit value known.

Spain

No exposure limit value known.

Turkey

No exposure limit value known.

Czech Republic

No exposure limit value known.

Ireland

No exposure limit value known.

Italy

No exposure limit value known.

Estonia

No exposure limit value known.

Lithuania

No exposure limit value known.

Slovakia

No exposure limit value known.

Hungary

No exposure limit value known.

Poland

No exposure limit value known.

Slovenia

No exposure limit value known.

Latvia

No exposure limit value known.

Greece

No exposure limit value known.

Portugal

No exposure limit value known.

Bulgaria

No exposure limit value known.

Romania

No exposure limit value known.

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

Ingredient name **Exposure /Effects**

DNELs

Population

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 ³	Workers
Long term Dermal/Systemic	8.3 mg/kg bw/day	Workers
Long term Inhalation/Systemic	12.3 mg/m ³	Workers
Short term Dermal/Systemic	3.6 mg/kg bw/day	General
Short term Inhalation/Systemic	0.75 mg/m ³	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 ³	General
Long term Oral/Systemic	0.75 mg/kg bw/day	General

PNECs**Ingredient name Compartment Detail PNECs Method Detail**

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

8.2. Exposure controls

Exposure Controls information can be found in the Exposures Scenario(s) attached as Annex to this Safety Data Sheet.

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.

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties****Appearance**

Physical state	: Liquid
Color	: Light yellow
Odor	: Not determined
Odor threshold	: Not determined
pH	: Estimated. 7
Melting Point	: Not determined
Initial boiling point and boiling range	: Greater than 200 °C (392 °F)
Flash point	: Greater than 150 °C (302 °F)
Evaporation rate	: Not determined
Flammability	: Not determined
Explosion limits	
Upper:	: Not determined

Lower:	:	Not determined
Vapor pressure	:	Less than 0.01 Pa @20 °C (68 °F)
Vapor density	:	Not determined
Relative density	:	Not determined
Solubility	:	Estimated. 0.009 kg/m ³ @23 °C(73 °F)
Partition coefficient:	:	LogPow 3
n-octanol/water		
Auto-ignition temperature	:	Greater than 300 °C (572 °F)
Decomposition temperature	:	Not determined
Viscosity	:	Kinematic-Not determined Dynamic- 12 - 14 Pa·s @25 °C (77 °F)
Explosive properties	:	Not determined
Oxidising properties	:	Not determined

9.2. Other information

Not applicable.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reacts with strong oxidising agents. Polymerises exothermically with amines, mercaptans and Lewis acids at ambient temperature and above. Polymerises in contact with caustic soda. Reacts exothermically with bases (eg caustic soda), ammonia, primary and secondary amines, alcohols, water and acids.

10.2. Chemical stability

The product is stable.

10.3. Possibility of hazardous reactions

Hazardous reactions or instability may occur under certain conditions of storage or use.

10.4. Conditions to avoid

Caustic soda (sodium hydroxide) can induce vigorous polymerisation at temperatures around 200 °C.

10.5. Incompatible materials

Reactive or incompatible with the following materials: strong oxidizing agents, sodium hydroxide,

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 toxicological effects

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.

SECTION 12: Ecological information**12.1. Toxicity**

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.

12.2. Persistence and degradability

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.

12.3. Bioaccumulative potential

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.

12.4. Mobility in soil**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.

12.5. Results of PBT and vPvB assessment**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.

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

No known adverse effects.

SECTION 13: Disposal considerations

Please check the ES Annex for additional recommendations to the identified uses.

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
ADR	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (LIQUID EPOXY RESIN)	9	III

RID	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (LIQUID EPOXY RESIN)	9	III
ICAO/IATA	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (LIQUID EPOXY RESIN)	9	III
IMO/IMDG	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (LIQUID EPOXY RESIN)	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.

SECTION 15: Regulatory information

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

SEVESO Directive 96/82/EC	:	<u>Ingredient name</u> <u>reaction product:</u> <i>bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)</i>	<u>Listed</u> yes
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REACH Annex XVII	:	Not listed
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Biocides - Annex I to Directive 98/8/EC	:	Not listed
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Prior Informed Consent. List of chemicals subject to the international PIC procedure (Part I, II, III)	:	None required.
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Integrated pollution prevention and control list (IPPC) - Air	:	Not listed
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Integrated pollution prevention and control list (IPPC) - Water	:	Not listed
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National regulations

Denmark

MAL-code : 00 - 5

Germany

Hazard class for water : WGK 2, Appendix No. 2

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) This material is listed or exempted.
 Canada inventory This material is listed or exempted.
 Japan inventory This material is listed or exempted.
 China inventory (IECSC) This material is listed or exempted.
 Korea inventory This material is listed or exempted.
 New Zealand Inventory (NZIoC) Not determined.
 Philippines inventory (PICCS) This material is listed or exempted.
 United States inventory (TSCA 8b) This material is listed or exempted.

15.2. Chemical Safety Assessment

Chemical Safety Assessment has been completed.

SECTION 16: Other information

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.

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

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.

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

Process Category

PROC 1 Use in closed process, no likelihood of exposure
 PROC 2 Use in closed, continuous process with occasional controlled exposure
 PROC 3 Use in closed batch process (synthesis or formulation)
 PROC 4 Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC 5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
 PROC 6 Calendering operations
 PROC 7 Industrial spraying
 PROC 8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
 PROC 8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC 9 Transfer of substance or preparation into small containers (dedicated filling line, including

	weighing)
PROC 10	Roller application or brushing
PROC 11	Non industrial spraying
PROC 12	Use of blowing agents in manufacture of foam
PROC 13	Treatment of articles by dipping and pouring
PROC 14	Production of preparations or articles by tableting, compression, extrusion, pelletisation
PROC 15	Use as laboratory reagent
PROC 16	Using material as fuel sources, limited exposure to unburned product to be expected
PROC 19	Hand-mixing with intimate contact and only PPE available.
PROC 20	Heat and pressure transfer fluids in dispersive, professional use but closed systems.
PROC 21	Low energy manipulation of substances bound in materials and/or articles
PROC 22	Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting
PROC 23	Open processing and transfer operations with minerals/metals at elevated temperature
PROC 24	High (mechanical) energy work-up of substances bound in materials and/or articles
PROC 24c	High (mechanical) energy work-up of substances bound in materials and/or articles - pt > mp - High Fugacity
PROC 25	Other hot work operations with metals

Sector of Use

SU 1	Agriculture, forestry, fishery
SU 2a	Mining, (without offshore industries)
SU 2b	Offshore industries
SU 3	Uses of substances as such or in preparations at industrial sites
SU 5	Manufacture of textiles, leather, fur
SU 6a	Manufacture of wood and wood products
SU 6b	Manufacture of pulp, paper and paper products
SU 7	Printing and reproduction of recorded media
SU 8	Manufacture of bulk, large scale chemicals (including petroleum products)
SU 9	Manufacture of fine chemicals
SU 10	Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
SU 11	Manufacture of rubber products
SU 12	Manufacture of plastics products, including compounding and conversion
SU 13	Manufacture of other non-metallic mineral products, e.g. plasters, cement
SU 14	Manufacture of basic metals, including alloys
SU 15	Manufacture of fabricated metal products, except machinery and equipment
SU 16	Manufacture of computer, electronic and optical products, electrical equipment
SU 17	General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment.
SU 18	Manufacture of furniture
SU 19	Building and construction work
SU 21	Consumer uses: Private households (= general public = consumers)
SU 22	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
SU 23	Electricity, steam, gas water supply and sewage treatment
SU 24	Scientific research and development

Environmental Release Category

ACEA1	Automotive vehicles - Solids
ACEA2	Automotive vehicles - Volatiles/Solvents
BFL/ZKF1	Acabado de vehículos - Sólidos
BFL/ZKF2	Vehicle Refinishing - Volatiles/Solvents
CEPE1	Formulation of Organic Solvent Borne Coatings and Inks - Large Scale (>100 tpa solvent use) - VOC
CEPE2	Formulation of Organic Solvent Borne Coatings and Inks - Small Scale (<100 tpa solvent use) - VOC
CEPE3	Formulation of Organic Solvent Borne Coatings and Inks - Solids
CEPE4	Formulation of Water Borne Coatings and Inks - Large Scale (>100 tpa solvent use) - VOC
CEPE5	Formulation of Water Borne Coatings and Inks - Small Scale (<100 tpa solvent use) - VOC
CEPE6	Formulation of Water Borne Coatings and Inks - Solids
CEPE7	Formulation of Powder Coatings and Inks - Solids
CEPE8	Formulation of Liquid Coatings and Inks (where specific use not known) - Large Scale(>100 tpa solvent use) - VOC
CEPE9	Formulation of Liquid Coatings and Inks (where specific use not known) - Small Scale (<100 tpa solvent use) - VOC
CEPE10	Formulation of Liquid Coatings and Inks (where specific use not known) - Solids
CEPE11	Wide Dispersive Application of Decorative Coatings - Consumer and Professionals - indoor

	use - Solvents and volatiles
CEPE12	Wide Dispersive Application of Decorative Coatings - Consumer and Professionals - indoor use - Solids
CEPE13	Wide Dispersive Application of Decorative Coatings - Consumer and Professionals - outdoor use - Solvents and Volatiles
CEPE14	Wide Dispersive Application of Decorative Coatings - Consumer and Professionals - outdoor use - Solids
CEPE15	Other spray coating - Volatiles / Abatement
CEPE16a	Other spray coating, indoor use - point sources - Volatiles
CEPE16b	Other spray coating, indoor use - wide dispersive - Volatiles
CEPE17a	Other spray coating, indoor use - point sources - Solids
CEPE17b	Other spray coating, indoor use - wide dispersive - Solids
CEPE18	Powder spraying
COLIPA 12	Formulation of cosmetic products involving cleaning with Organic Solvents (Varnish / Removers, Decorative Cosmetics, Spray, Lacquer, Fine Fragrance, Solar oil, solid products - (medium scale)
COLIPA19	Wide Dispersive Use of Aerosol products for hair and skin care (Non-Propellants)
ECCA1	Industrial Coil Coating - Solids
ECCA2	Industrial Coil Coating - Volatiles
EMPAC1	Industrial Use of Paint, Coatings in metal packaging - Non-Solvents
EMPAC2	Industrial Use of Paint, Coatings in metal packaging - Solvents
ERC 1	Manufacture of substances
ERC 2	Formulation of preparations
ERC 3	Formulation in materials
ERC 4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC 5	Industrial use resulting in inclusion into or onto a matrix
ERC 6a	Industrial use resulting in manufacture of another sub-stance (use of intermediates)
ERC 6b	Industrial use of reactive processing aids
ERC 6c	Industrial use of monomers for manufacture of thermoplastics
ERC 6d	Industrial use of process regu-lators for polymerisation proc-esses in production of resins, rubbers, polymers
ERC 7	Industrial use of substances in closed systems
ERC 8a	Wide dispersive indoor use of processing aids in open systems
ERC 8b	Wide dispersive indoor use of reactive substances in open systems
ERC 8c	Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC 8d	Wide dispersive outdoor use of processing aids in open systems
ERC 8f	Wide dispersive outdoor use resulting in inclusion into or a matrix
ERC 10a	Wide dispersive outdoor use of long-life articles and materials with low release
ERC 11a	Wide dispersive indoor use of long-life articles and materials with low release
ESVOC1	Manufacture of the substance and subsequent recycling/recovery, including material transfers, storage, and maintenance
ESVOC2	Use as a isolated intermediate not under stricitly controlled conditions
ESVOC4	Formulation & packing of mixtures in batch or continuous operations, including storage, materials transfers, large and small scale packing, and maintenance
FEICA1	Formulation of Solventless/ Solvent Borne Adhesives - Solids
FEICA2	Formulation of Solvent Borne adhesives - Volatiles (Large Scale)
FEICA3	Formulation of Solvent Borne adhesives - Volatiles (Small Scale)
FEICA4	Formulation of Water Borne adhesives - Volatiles
FEICA5	Formulation of Water Borne adhesives - Solids
FEICA6	Industrial Use of Substances other than Solvents in Paper, Board and related Products / Woodworking and joinery / Footwear and Leather, Textile, Others Adhesives
FEICA7	Industrial Use of Substances other than Solvents in Transportation (Automotive/aircraft/rail vehicles) / industrial Building Construction Adhesives
FEICA8	Industrial Use of Solvents in Paper, Board and related Products / Woodworking and joinery / Footwear and Leather, Textile, Others Adhesives
FEICA9	Industrial Use of Solvents in Transportation (Automotive/aircraft/rail vehicles) / industrial Building Construction Adhesives
FEICA10	Wide dispersive Use of Substances other than Solvents in Building Construction Adhesives for indoor application
FEICA11	Wide dispersive Use of Substances other than Solvents in Professional and DIY Adhesives
FEICA12	Wide dispersive Use of Solvents in Building Construction Adhesives for indoor application
FEICA13	Wide dispersive Use of Solvents in Professional and DIY Adhesives
FEICA14	Wide dispersive Use of Substances other than Solvents in Building Construction Adhesives for outdoor application
FEICA15	Wide dispersive Use of Solvents in Building Construction Adhesives for outdoor application
mERC 1.1	Environmental releases related to manufacture and use of the substance by the Registrant.
mERC 1.2	Environmental releases related to use of the substance as a reactant, monomer or blending in a mixture by a DU.

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

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