

SAFETY DATA SHEET



According to Regulation (EC) No 1907/2006, Annex II, as amended.

COMMISSION REGULATION (EU) 2015/830 of 28 May 2015.

Version: 1.02

Revision Date: 16.09.2020

Print Date: 16.09.2020

1. Company and Product Identification

1.1 Product Identifiers

Product Name Mechanically Enhanced Prepreg
Product Number GA-MEC -001 / -002 / -003 / -004 / -005 / -006 / -007 / -009
UN3082 FLG

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

Identified Uses Mechanical components or structural composites
ES4: Industrial Uses
ES5: Professional Uses

Uses advised against No specific uses advised against are identified

1.3 Details of the supplier of the safety data sheet

Company Haydale Limited
Clos Fferws, Parc Hendre,
Capel Hendre,
Ammanford,
Carmarthenshire,
SA18 3BL
UNITED KINGDOM

Telephone +44 (0)1269 842946

Fax +44 (0)1269 831062

E-mail address info@haydale.com

1.4 Emergency telephone number

Emergency # +44 (0)1269 842946 Mon – Fri between 09:00 – 16:00 hours

2 Hazards Identification

Classification (EC 1272/2008)

Physical and Chemical Hazards

Human health	Skin Irrit. 2	- H315
	Skin Sens. 1	- H317
	Eye Irrit. 2	- H319
	Resp Irrit.	- H335
Environment	Aquatic Chronic 2	- H411
	Aquatic Chronic 3	- H412

Classification (1999/45/EEC) Xi;R36/38
R43
N; R51/53

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Human health Risk of serious damage to eyes. Irritating to skin. May cause sensitisation by skin contact.

Environment Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Harmful to aquatic life with long-lasting effects.

CONTROLLED DOCUMENT – UNCONTROLLED WHEN PRINTED

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROPRIETRY TO HAYDALE AND ITS SUBSIDIARIES

2.2. Label elements (Pictogram)

Label In Accordance With (EC) No. 1272/2008 and California Proposition 65



Signal Word

Warning

Additional Label Description

California Proposition 65

Reaction product of Bisphenol A and epichlorohydrin, which material classification are listed in California Proposition 65. Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin.

WARNING: This product contains chemicals known to the State of California to cause cancer, and birth defects or other reproductive harm.

ADVERTENCIA: Este producto contiene productos químicos reconocidos por el estado de California que provocan cáncer, defectos de nacimiento u otros daños reproductivos.

Hazard Statements

H315	Causes skin irritation
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H335	May cause respiratory irritation
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to the aquatic environment

Precautionary Statements

Prevention

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P261	Avoid breathing dust/fume/gas/vapours/mist/spray.
P264	Wash skin thoroughly after handling.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Response

P321	Specific treatment (see medical advice on this label).
P370+378	In case of fire: Use foam, carbon dioxide, dry powder or water fog for extinction.
P302+352	IF ON SKIN: Wash with plenty of soap and water.
P303+361+353	IF ON SKIN (or hair): Immediately remove all contaminated clothing. Rinse skin with water/shower.
P304+340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P332+313	If skin irritation occurs: Get medical advice/attention.
P333+313	If skin irritation or rash occurs: Get medical advice/attention.
P337	If eye irritation persists: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage
P403+235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/container in accordance with local regulations

CONTROLLED DOCUMENT – UNCONTROLLED WHEN PRINTED

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROPRIETRY TO HAYDALE AND ITS SUBSIDIARIES

Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

3 Composition and Information On Ingredients

Mixtures

Graphite in the form of graphene (proprietary)		<1% w/w
CAS-No.: ...	EC No.: ...	
Classification (EC 1272/2008) 6 active applications for registration with ECHA for authorisation, 14/08/2019	Classification H319 – Causes serious eye irritant H335 – STOT SE 3 – Resp tract	
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane		25 - 45% w/w
CAS-No.: 1675-54-3	EC No.: 216-823-5	
Classification (EC 1272/2008) Skin Irrit. 1 – H315 Skin Sens. 1 - H317 Eye Irrit. 2 - H319 Aquatic Chronic 3 – H411	Classification (67/548/EEC) Xi; R36/38 R43 N; R51/53	
bisphenol-A-(epichlorhydrin)		1 - 5 % w/w
CAS-No.: 25068-38-6	EC No.: 500-033-5	
Classification (EC 1272/2008) Skin Irrit. 1 – H315 Skin Sens. 1 - H317 Eye Irrit. 2 - H319 Aquatic Chronic 2 – H412	Classification (67/548/EEC) Xi; R36/38 R43 N; R51/53	

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

Composition Comments

Epoxy resin solution with graphite (in the form of graphene) mixture impregnated to carbon textile weave.

California Proposition 65



Reaction product of Bisphenol A and epichlorohydrin, which material classification are listed in California Proposition 65. Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin.

WARNING: This product contains chemicals known to the State of California to cause cancer, and birth defects or other reproductive harm.

ADVERTENCIA: Este producto contiene productos químicos reconocidos por el estado de California que provocan cáncer, defectos de nacimiento u otros daños reproductivos.

CONTROLLED DOCUMENT – UNCONTROLLED WHEN PRINTED

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROPRIETRY TO HAYDALE AND ITS SUBSIDIARIES

4 First Aid Measures

4.1. Description of first aid measures

General Information	Contaminated disposable PPE must go to hazardous waste after use. Wash contaminated workwear and/or clothing before reuse. Seek medical attention if symptoms persist or any discomfort continues. Take this Safety Data Sheet to show the medical personnel.
Skin Contact	It is important to remove the substance from the skin immediately. Remove contamination with soap and plenty of water or recognised skin cleansing agent. Immediately remove contaminated PPE and/or clothing. Seek medical attention if symptoms are severe or persist after washing. In the event of any sensitisation symptoms developing, ensure further exposure is avoided.
Inhalation	Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Loosen tight clothing such as collar, tie or belt. Get medical attention if symptoms are severe or persist.
Eye Contact	Do not rub eye. Remove any contact lenses and open eyelids wide apart. Rinse with water. Get medical attention if any discomfort continues. Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention promptly if symptoms occur after washing. Get medical attention if any discomfort continues.
Ingestion	Rinse mouth thoroughly with water. Keep person under observation. Get medical advice/attention if you feel unwell. Do not induce vomiting unless under the direction of medical personnel.
Protection of First Aiders	First aid personnel should wear appropriate protective equipment during any rescue.

4.2 Most important symptoms and effects, both acute and delayed

General information	The severity of the symptoms described will vary dependent on the concentration and the length or duration of exposure. Treat symptomatically.
Inhalation	No specific symptoms known.
Ingestion	May cause sensitisation or allergic reactions in sensitive individuals. May cause irritation.
Skin contact	Irritating to skin. May cause skin sensitisation or allergic reactions in sensitive individuals.
Eye contact	Irritating to eyes.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor	Treat symptomatically. May cause sensitisation or allergic reactions in sensitive individuals.
-----------------------------	--

5 Firefighting Measures

5.1. Extinguishing media

Fire Hazards	The product is not flammable. Burning will produce toxic fumes. Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog. Use fire-extinguishing media suitable for the surrounding fire.
Extinguishing Media	Fire can be extinguished using: Foam, carbon dioxide or dry powder. Dry chemicals, sand, dolomite etc. Do not use water jet as an extinguisher as this will spread the fire.

CONTROLLED DOCUMENT – UNCONTROLLED WHEN PRINTED

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROPRIETRY TO HAYDALE AND ITS SUBSIDIARIES

Firefighting Instructions If trained and competent to do so; Use pressurised air mask if product is involved in a fire. Cool containers exposed to flames with water continuously until well after the fire is out. Keep run-off water out of sewers and water sources. Protective equipment for fire-fighters, self-contained breathing apparatus and full protective clothing must be worn in case of fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards None known.
Hazardous combustion products Thermal decomposition or combustion products may include the following substances: Harmful gases or vapours, including carbon oxides.

5.3. Advice for firefighters

Protective actions during Firefighting Avoid breathing fire gases or vapours. Evacuate area. Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Cool containers exposed to flames continuously with water until well after the fire is out. Avoid discharge to the aquatic environment. Control run-off water by containing and keeping it out of sewers and watercourses. If risk of water pollution occurs, notify appropriate authorities.

Special protective Equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Firefighter's clothing conforming to European standard EN469 (including helmets, protective boots and gloves) will provide a basic level of protection for chemical incidents.

6 Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Wear protective clothing as described in Section 8 of this safety data sheet. No action shall be taken without appropriate training or involving any personal risk. Do not touch or walk into spilled material. Avoid contact with skin and eyes.

6.2. Environmental precautions

Environmental precautions Avoid discharge into drains or watercourses or onto the ground. Avoid discharge to the aquatic environment.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Wear protective clothing as described in Section 8 of this safety data sheet. Clear up spills immediately and dispose of waste safely. Collect spillage with a shovel and broom, or similar and reuse, if possible. Collect and place in suitable waste disposal containers and seal securely. Flush contaminated area with plenty of water. Wash thoroughly after dealing with a spillage. Dangerous for the environment. Do not empty into drains. For waste disposal, see Section 13.

6.4. Reference to other sections

Reference to other sections For additional information on personal protection, see Section 8.
For additional information on health hazards, see Section 11.
For additional information on ecological hazards, see Section 12.
For additional information on waste disposal, see Section 13.

7 Handling And Storage

7.1. Precautions for safe handling

CONTROLLED DOCUMENT – UNCONTROLLED WHEN PRINTED

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROPRIETRY TO HAYDALE AND ITS SUBSIDIARIES

Usage precautions Wear protective clothing as described in Section 8 of this safety data sheet. Keep away from food, drink and animal feeding stuffs. Keep container tightly sealed when not in use. Avoid discharge to the aquatic environment. Do not handle until all safety precautions have been read and understood. Do not handle broken packages without protective equipment. Do not reuse empty containers.

Advice on general occupational hygiene Wash promptly if skin contact occurs. Take off contaminated clothing. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store away from incompatible materials (see Section 10). Keep only in the original packaging. Refrigerate -18°C. Protect material to avoid damage from impact or crushing.

Storage class Miscellaneous hazardous material storage.

7.3. Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

8 Exposure Controls and Personal Protection

Derived effect levels

Product/ingredient name	Type	Exposure routes	Value	Population	Effects
2,2'-[(1-methylethylidene) bis(4,1-phenylene oxymethylene)]bisoxirane	DNEL	Dermal Short-term exposure	8,33 mg/kg bw/day	Workers	Systemic
-	-	Inhalation Short-term exposure	12,25 mg/m ³	Workers	Systemic
-	-	Inhalation Long-term exposure	12,25 mg/m ³	Workers	Systemic

Predicted effect concentrations

Product/ingredient name	Type	Compartment Detail	Value	Method Detail
2,2'-[(1-methylethylidene) bis(4,1-phenylene oxymethylene)]bisoxirane	PNEC	Fresh water	0,006 mg/l	Assessment Factors
	PNEC	Marine	0,006 mg/l	Assessment Factors
	PNEC	Freshwater - intermittent	0,018 mg/l	Assessment Factors
	PNEC	Fresh water sediment	0,996 mg/kg	Equilibrium Partitioning
	PNEC	Marine water sediment	0,996 mg/kg	Equilibrium Partitioning
	PNEC	Soil	0,196 mg/kg	Equilibrium Partitioning
	PNEC	Sewage treatment plant	10 mg/l	Assessment Factors
	PNEC	Secondary Poisoning	11 mg/l	Assessment Factors

Product/ingredient name	Type	Compartment Detail	Value	Method Detail
Graphite	WEL	Inhalable dust	10 mg/m ³	Long term (UK)
	WEL	Respirable dust	4 mg/m ³	Long term (UK)
	DNEL	inhalational	1.2 mg/m ³	Industry, long term, local effects
	DNEL	Inhalational	0.3 mg/m ³	Consumer, long term, local effects
	DNEL	Oral (bw/day)	813 mg/kg	Consumer, long term, systemic effects

CONTROLLED DOCUMENT – UNCONTROLLED WHEN PRINTED

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROPRIETRY TO HAYDALE AND ITS SUBSIDIARIES

California Proposition 65

Reaction product of Bisphenol A and epichlorohydrin, which material classification are listed in California Proposition 65. Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin.

WARNING: This product contains chemicals known to the State of California to cause cancer, and birth defects or other reproductive harm.

ADVERTENCIA: Este producto contiene productos químicos reconocidos por el estado de California que provocan cáncer, defectos de nacimiento u otros daños reproductivos.

8.1. Control parameters

Ingredient comments Refer to table(s) above for exposure limits known for ingredient(s).

8.2. Exposure controls

Protective equipment



Engineering controls Ventilated workplace. Observe any occupational exposure limits for the product or ingredients, where applicable.

Eye/face protection Wear tight-fitting, chemical splash goggles or face shield. If inhalation hazards exist, a full face respirator with integrated face shield may be required instead.

Hand protection Wear protective gloves. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. To protect hands from chemicals, gloves should comply with European Standard EN374.

Butyl rubber, EVAL; Long term (BTT >480 min)
Neoprene, Nitrile Rubber; Short term/ splash (10 min < BTT < 480 min)

Considering the data specified by the glove manufacturer, check during use that the gloves are retaining their protective properties and change them as soon as any deterioration is detected. Frequent changes are recommended.

Other skin and body protection May cause skin sensitisation or allergic reactions in sensitive individuals. Wear appropriate clothing to prevent repeated or prolonged skin contact.

Hygiene measures Wash after use and before eating, smoking and using the toilet. Do not eat, drink or smoke when using this product.

Respiratory protection Where determined by safety risk assessment to be necessary; respiratory protective equipment must be suitable for its intended use and is obtained from a reputable supplier and 'CE' marked. Check that the respirator fits tightly and the filter is changed regularly. Gas and combination filter cartridges should comply with European Standard EN14387. Full face mask respirators with replaceable filter cartridges should comply with European Standard EN136. Half mask and quarter mask respirators with replaceable filter cartridges should comply with European Standard EN140.

Environment exposure controls Keep container tightly sealed when not in use. 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.

CONTROLLED DOCUMENT – UNCONTROLLED WHEN PRINTED

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROPRIETRY TO HAYDALE AND ITS SUBSIDIARIES

9 Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance	Fibrous solid.
Colour	Amber or Black
Odour	Almost odourless.
Melting point	No information available.
Flash point	No information available.
Flammability (solid, gas)	No specific test data are available.
Vapour pressure	No information available.
Bulk density	~ 1210 kg/m ³
Solubility(ies)	No specific test data are available.
Decomposition	Carbon oxides
Comments	Information declared as "Not available" or "Not applicable" is not considered to be relevant to the implementation of the proper control measures.

9.2. Other information

Other information No other information available.

10 Stability and Reactivity

10.1. Reactivity

Reactivity See the other subsections of this section for further details.

10.2. Chemical stability

Stability Stable at normal ambient temperatures and when used as recommended. Stable under the prescribed storage conditions.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Reaction product of Bisphenol A and epichlorohydrin, which material classification are listed in California Proposition 65. Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin.

10.4. Conditions to avoid

Conditions to avoid There are no known conditions that are likely to result in a hazardous situation.

10.5. Incompatible materials

Materials to avoid No specific material or group of materials is likely to react with the product to produce a hazardous situation.

10.6. Hazardous decomposition products

Hazardous Decomposition Products Does not decompose when used and stored as recommended. Thermal decomposition or combustion products may include carbon dioxide, carbon monoxide and nitrogen oxides.

11 Toxicological Information

CONTROLLED DOCUMENT – UNCONTROLLED WHEN PRINTED

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROPRIETRY TO HAYDALE AND ITS SUBSIDIARIES

Acute Toxicity Data

Product/ingredient name	Test	Result	Route	Species
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylen)]bisoxirane	LC50 Inhalation Vap.	0.00001 ppm	5 Hrs	Rat
	LD50 Dermal	>2000 mg/kg		Rat
	LD50 Oral	>2000 mg/kg		Rat
Graphite (bound in epoxy resin)	LD50 Oral	>2000 mg/kg		Rat
	LC50 inhalation	2000 mg/m3	4 hrs	Rat
	LC50 inhalation	2000 mg/m3	4 hrs	Rat

Product/ingredient name	Test	Species	Route	Result
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylen)]bisoxirane	OECD 404 Acute Dermal Irritation/ Corrosion	Rabbit	Skin	Mild Irritant
	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes	Mild Irritant
Graphite (bound in epoxy resin)	OECD 404 Acute Dermal Irritation/ Corrosion	Rabbit	Skin	No Skin irritation
	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes	No eye irritation

Product/ingredient name	Test	Species	Route	Result
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylen)]bisoxirane	OECD 429 Skin Sensitisation	Mouse	Skin	May Cause skin sensitisation

Product/ingredient name	Test	Metabolic Activation	Concentration	Result
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylen)]bisoxirane	OECD 476 Genotoxicity in vitro	With and without	-	Positive
	OECD 471 Genotoxicity in vitro	With and without	0 – 5000 µg/plate	Positive

Product/ingredient name	Test	Cell Type	Concentration	Result
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylen)]bisoxirane	OECD 478 Genotoxicity in vivo	Germ	-	Negative
	OPPTS 870.5395 Genotoxicity in vivo	Somatic	0 – 5000 mg/kg	Negative

Product/ingredient name	Test	Species	Route	Dose	Result
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylen)]bisoxirane	OECD 453 Carcinogenicity	Rat male & female	Oral	15 mg/kg 7 days/week 24 months	Negative
	OECD 453 Carcinogenicity	Mouse male	Dermal	0.1 mg/kg 3 days/week 24 months	Negative
	OECD 453 Carcinogenicity	Rat female	Dermal	1 mg/kg 5 days/week 24 months	Negative

Product/ingredient name	Test	Species	Route	Dose	Result
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylen)]bisoxirane	OECD 416 Fertility	Rat male & female	Oral	>750 mg/kg No observed effect level 540 mg/kg	No effects
	Other guidelines Foetal Development	Rabbit female	Dermal	No observed effect level 30 mg/kg	No teratogenic effects
	OECD 414 Foetal Development	Rabbit female	Oral	No observed effect level 60 mg/kg	No teratogenic effects
	OECD 414 Foetal Development	Rat female		No observed effect level 180 mg/kg	No teratogenic effects

CONTROLLED DOCUMENT – UNCONTROLLED WHEN PRINTED

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROPRIETRY TO HAYDALE AND ITS SUBSIDIARIES

Product/ingredient name	Test	Species	Route	NOAEL/Dose	Result
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylen)]bisoxirane	Sub-chronic Toxicity Repeated Exposure	Rat male & female	Ingestion	50 mg/kg 7 days/week 14 weeks	Negative
	Sub-chronic Toxicity Repeated Exposure	Rat male & female	Skin Contact	10 mg/kg 5 days/week 13 weeks	Negative
	Sub-chronic Toxicity Repeated Exposure	Mouse male	Skin Contact	100 mg/kg 3 days/week 13 weeks	Negative

12 Ecological Information

Eco-toxicity Toxic to aquatic life with long term effects
Classification based on calculation and concentration thresholds

Product/ingredient name	Test (Species)	Value	Comment
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylen)]bisoxirane	LC50 (fish)	1.5 mg/l	96 hr
	EC50 (aquatic invertebrates)	2.7 mg/l	48 hr
	NOEC (Daphnia magna)	0.3 mg/l	21 days
	EC50 (aquatic algae)	9.4 mg/l	72 hrs
	IC50 (bacteria)	>100 mg/l	3 hrs
Graphite	LC50 (fish)	100 mg/l	96 hr
	NOEC (fish)	100 mg/l	4 days
	EC50 (aquatic invertebrates)	100 mg/l	48 hrs
	EC50 (aquatic algae)	100 mg/l	72 hrs

Persistence and degradability

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

Biodegradability: Inoculum: Sewage (STP effluent)
Concentration: 20 mg/l
Result: Not readily biodegradable.

Biodegradation: 5 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Stability in water: Degradation half-life (DT50): 4,83 d (25 °C)
pH: 4
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half-life (DT50): 7,1 d (25 °C)
pH: 9
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half-life (DT50): 3,58 d (25 °C)
pH: 7
Method: OECD Test Guideline 111
Remarks: Fresh water

Bioaccumulative potential

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

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

CONTROLLED DOCUMENT – UNCONTROLLED WHEN PRINTED

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROPRIETRY TO HAYDALE AND ITS SUBSIDIARIES

Partition coefficient: n-octanol/water:
log Pow: 3,242 (25 °C)
pH: 7,1
Method: OECD Test Guideline 117

Mobility in soil

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

Distribution among environmental compartments:
Koc: 445

Results of PBT and vPvB assessment

Product Assessment: This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Other adverse effects Toxic to aquatic life with long lasting effects.
Harmful to aquatic life with long lasting effects.

12.1. Toxicity

Toxicity Aquatic Chronic 2 – H411 Toxic to aquatic life with long lasting effects.
Aquatic Chronic 3 – H412 Harmful to aquatic life with long lasting effects.

12.2. Persistence and degradability

Persistence and degradability Degradability of the product is not known.

12.3. Bioaccumulative potential

Bioaccumulative potential No data available on bioaccumulation.

12.4. Mobility in soil

Mobility No data available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB results No data available.

12.6. Other adverse effects

Other adverse effects None known.

13 Disposal Considerations

13.1. Waste treatment methods

General information Generation of waste should be minimised or avoided wherever possible. Reuse or recycle products wherever possible. This material and its container must be disposed of in a safe way. When handling waste, the safety precautions applying to handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out. Empty containers or liners may retain some product residues and hence be potentially hazardous.

Disposal methods Do not empty into drains. Dispose of surplus products and those that cannot be recycled via a licensed waste disposal contractor. Waste, residues, empty containers, discarded work clothes and contaminated cleaning materials should be collected in designated containers, labelled with their contents. Incineration or landfill should only be considered when recycling is not feasible.

14 Transport Information

UN number

UN No. (ADR/RID/ADN)	3082 FLG
UN No. (IMDG)	3082 FLG
UN No. (ICAO)	3082 FLG
UN proper shipping name	

Proper Shipping Name

-

Transport hazard class(es) Not applicable

ADR/RID/ADN Class	9
ADR Label No.	9
IMDG Class	9
ICAO Class/Division	9
Transport Labels	

**Packing group** Not applicable

ADR/RID/ADN Packing group	III
IMDG Packing group	III
ICAO Packing group	III

14.5. Environmental hazards**Environmentally Hazardous Substance/Marine Pollutant**
YES

15 Regulatory Information

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

EU Legislation

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

California Proposition 65 

Reaction product of Bisphenol A and epichlorohydrin, which material classification are listed in California Proposition 65. Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin.

WARNING: This product contains chemicals known to the State of California to cause cancer, and birth defects or other reproductive harm.

Known Carcinogen(s): Epichlorohydrin [CAS 106-89-8]

Known Reproductive Toxin(s): Epichlorohydrin [CAS 106-89-8], Bisphenol A [CAS 80-05-7]

ADVERTENCIA: Este producto contiene productos químicos reconocidos por el estado de California que provocan cáncer, defectos de nacimiento u otros daños reproductivos.

For more information: www.P65Warnings.ca.gov

Abbreviations and acronyms used in the safety data sheet	<p>ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.</p> <p>ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.</p> <p>RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.</p> <p>IATA: International Air Transport Association.</p> <p>ICAO-TI: Technical Instructions for the Safe Transport of Dangerous Goods by Air.</p> <p>IMDG: International Maritime Dangerous Goods.</p> <p>CAS: Chemical Abstracts Service.</p> <p>ATE: Acute Toxicity Estimate.</p> <p>LC₅₀: Lethal Concentration to 50 % of a test population.</p> <p>LD₅₀: Lethal Dose to 50% of a test population (Median Lethal Dose).</p> <p>EC₅₀: 50% of maximal Effective Concentration.</p> <p>PBT: Persistent, Bioaccumulative and Toxic substance.</p> <p>vPvB: Very Persistent and Very Bioaccumulative.</p>
Classification abbreviations and acronyms	<p>Eye Irrit. = Eye irritation</p> <p>Skin Irrit. = Skin irritation</p> <p>Skin Sens. = Skin sensitisation</p> <p>Aquatic Chronic = Toxic/Hazardous to the aquatic environment (chronic)</p>
Risk Phrases in Full	
R36/38	Irritating to eyes and skin.
R43	May cause sensitisation by skin contact.
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Harmful to aquatic life with long lasting effects.
Hazard Statements In Full	
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.
H412	harmful to aquatic life with long lasting effects.
General information	-
Classification procedures according to Regulation (EC) 1272/2008	<p>Skin Irrit. 2 - H315: 1 Eye Irrit. 2 - H319: Skin Sens. 1 - H317: Calculation method.</p> <p>Aquatic Chronic 2 – H411 : Calculation method. Aquatic Chronic 3 - H412: Calculation method.</p>
Training advice	Only trained personnel should use this material.
Additional Information	Further information on this product can be found on the Haydale website.
Revision Number	1.02
Revision Date	16/09/2020
Revision Summary	<p>Add GA-MEC suffix -003 / -004 / -005 / -006 / -007 / -009 to HAYD nomenclature Section 1</p> <p>Add GA-MEC suffix -001 / -002 to HAYD nomenclature Section 1</p> <p>Add California Proposition 65 statement and hazard pictogram Section 2, 3, 8 and 15</p> <p>Add bisphenol-A-(epichlorhydrin) and classification Section 3</p> <p>Add ventilation fan pictogram Section 8</p> <p>Add known toxins and carcinogens Section 15</p> <p>Add Transport UN code 3082 FLG and transport hazard pictograms Section 14</p>

SDS Number GA-MEC -001 / -002 / -003 / -004 / -005 / -006 / -007 / -009

SDS Status Approved

The content supplied in this safety data sheet ("Information") supersedes all previous versions supplied

The Information is designed only as guidance for the safe handling, storage, processing and/or use of the **Product**. The Information is correct to the best of the Haydale Group's knowledge and belief at the date of publication (**Haydale Group** means **Haydale Limited** as a subsidiary of **Haydale Graphene Industries plc.** and any subsidiary or holding company from time to time and any subsidiary from time to time of any holding company of Haydale Limited), however no express or implied warranty or guarantee or representation is made regarding the fitness for any particular purpose, merchantability, accuracy or completeness of the Information provided. The Information relates solely to the specific Product designated and may not be valid or applicable where the Product is handled, stored, processed or used in combination with any other materials or in any process other than those described in the Information.