SAFETY DATA SHEET
Permabond ES5504

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

1.1. Product identifier

Product name Permabond ES5504

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

Identified uses Adhesive.

1.3. Details of the supplier of the safety data sheet

Supplier

Permabond Engineering Adhesives Ltd.
Wessex Way
Colden Common
Winchester
Hampshire. SO21 1WP
United Kingdom
Tel: +44 (0)1962 711 661
Fax: +44 (0)1962 711 662
info.europe@permabond.com

1.4. Emergency telephone number

Emergency telephone UK +44 (0)1962 711 661 USA 0800 640 7599 Asia +86 (0)21 5773 4913

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

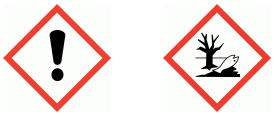
Physical hazards Not Classified

Health hazards Skin Irrit. 2 - H315 Eye Irrit. 2 - H319 Skin Sens. 1 - H317

Environmental hazards Aquatic Chronic 2 - H411

2.2. Label elements

Pictogram



Signal word Warning

Hazard 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.

Precautionary statements

P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302+P352a IF ON SKIN: Wash with plenty of soap and water
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

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Supplemental label information	EUH205 Contains epoxy constituents. May produce an allergic reaction.
Contains	POLYPHENOL CYANATE RESIN, EPOXY RESIN (Number average MW <= 700)
Supplementary precautionary statements	P264 Wash contaminated skin thoroughly after handling. P333+P313 If skin irritation or rash occurs: Get medical advice/ attention. P337+P313 If eye irritation persists: Get medical advice/ attention. P362+P364 Take off contaminated clothing and wash it before reuse. P391 Collect spillage. P501 Dispose of contents/container in accordance with existing Community, National and local regulations.

2.3. Other hazards

None under normal conditions.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

POLYPHENOL CYANATE RESIN **10-30%**

CAS number: 87397-54-4 EC number: 618-010-4

M factor (Acute) = 1 M factor (Chronic) = 1

Classification	Classification (67/548/EEC or 1999/45/EC)
Skin Sens. 1 - H317 Aquatic Acute 1 - H400 Aquatic Chronic 1 - H410	N;R50/53. R43.

EPOXY RESIN (Number average MW <= 700) **10-30%**

CAS number: 25068-38-6 EC number: 500-033-5 REACH registration number: 01-2119456619-26-XXXX

Classification	Classification (67/548/EEC or 1999/45/EC)
Skin Irrit. 2 - H315 Eye Irrit. 2 - H319 Skin Sens. 1 - H317 Aquatic Chronic 2 - H411	R43 Xi;R36/38 N;R51/53

METHYLENE DIPHENYL BIS(DIMETHYL UREA) **1-5%**

CAS number: 10097-09-3 EC number: 423-370-9 REACH registration number: 01-0000016986-54-XXXX

Classification	Classification (67/548/EEC or 1999/45/EC)
Aquatic Chronic 3 - H412	R52/53.

BISPHENOL A EPOXY - CTBN RUBBER ADDUCT **1-5%**

CAS number: 68610-41-3

Classification	Classification (67/548/EEC or 1999/45/EC)
Aquatic Chronic 2 - H411	N;R51/53.

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

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SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation Move the exposed person to fresh air. Get medical attention if any discomfort continues.

Ingestion Rinse mouth thoroughly with water. Give plenty of water to drink. Do not induce vomiting. Get medical attention if any discomfort continues.

Skin contact Remove contaminated clothing immediately and wash skin with soap and water. If symptoms develop, obtain medical attention

Eye contact Remove any contact lenses and open eyelids wide apart. Rinse immediately with plenty of water for 15 minutes holding the eyelids open. Get medical attention if any discomfort continues.

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

Skin contact Skin irritation. Mild dermatitis, allergic skin rash.

Eye contact Irritating and may cause redness and pain.

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

Notes for the doctor No specific recommendations. Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Extinguish with foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products Burning produces irritating, toxic and obnoxious fumes. Carbon monoxide, carbon dioxide, and unknown hydrocarbons.

5.3. Advice for firefighters

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 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.

6.2. Environmental precautions

Environmental precautions Do not discharge into drains or watercourses or onto the ground.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Absorb spillage with sand or other inert absorbent. Transfer to suitable, labelled containers for disposal.

6.4. Reference to other sections

Reference to other sections For personal protection, see Section 8. For waste disposal, see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Avoid contact with skin and eyes. Do not eat, drink or smoke when using the product.

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7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store at temperatures between 2°C and 7°C.

7.3. Specific end use(s)

Specific end use(s) Adhesive.

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

8.2. Exposure controls

Protective equipment

Appropriate engineering controls Provide adequate general and local exhaust ventilation. Observe any occupational exposure limits for the product or ingredients.

Eye/face protection The following protection should be worn: Chemical splash goggles or face shield. Personal eye protection should conform to EN 166

Hand protection Nitrile rubber or Viton™ gloves are recommended. Cotton or other absorbent gloves should not be worn. Gloves should conform to EN 374. 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.

Other skin and body protection Employee must wear appropriate protective clothing and equipment to prevent any possibility of skin contact with this substance.

Hygiene measures Wash at the end of each work shift and before eating, smoking and using the toilet. Promptly remove any clothing that becomes contaminated. Use appropriate skin cream to prevent drying of skin. When using do not eat, drink or smoke. Use of good industrial hygiene practices is required.

Respiratory protection Ensure adequate ventilation of the working area. Respiratory protection may be required if excessive airborne contamination occurs. Respiratory protection complying with an approved standard should be worn if a risk assessment indicates inhalation of contaminants is possible. Organic vapour filter. Type A.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance Liquid.

Colour Grey. Silver.

Odour Mild.

Odour threshold No information available.

pH Not relevant.

Melting point Not available.

Initial boiling point and range Not relevant.

Flash point >100°C

Evaporation rate Not available.

Vapour pressure Not available.

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Vapour density	Not available.
Relative density	1.6
Solubility(ies)	Insoluble in water. Soluble in the following materials: Organic solvents.
Partition coefficient	Not known.
Auto-ignition temperature	Not applicable.
Decomposition Temperature	Not available.
Viscosity	≈210000 mPa s @ 23°C
Explosive properties	Not relevant.
Oxidising properties	Not applicable.

9.2. Other information

Other information	Not relevant.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	The following materials may react with the product: Strong oxidising agents. Acids.

10.2. Chemical stability

Stability	Stable at normal ambient temperatures. Polymerises when heated.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	Reactions with the following materials may generate heat: Amines.

10.4. Conditions to avoid

Conditions to avoid	Do not store near heat sources or expose to high temperatures.

10.5. Incompatible materials

Materials to avoid	Amines. Strong oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products	Thermal decomposition could produce carbon monoxide, carbon dioxide, and unidentified organic compounds.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological effects	The toxicological properties of this product have not been fully evaluated. Avoid direct contact with skin or eyes. Do not ingest or inhale.

Acute toxicity - inhalation

Notes (inhalation LC_{50})	Irritating to respiratory system.

Serious eye damage/irritation

Serious eye damage/irritation	Irritating to eyes.

Skin sensitisation

Skin sensitisation	May cause sensitisation by skin contact.

Aspiration hazard

Aspiration hazard	None under normal conditions.

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Ingestion No harmful effects expected from quantities likely to be ingested by accident.

Toxicological information on ingredients.

EPOXY RESIN (Number average MW <= 700)

Acute toxicity - oral	
Acute toxicity oral (LD_{50} mg/kg)	11,400.0
Species	Rat
ATE oral (mg/kg)	11,400.0
Acute toxicity - dermal	
Acute toxicity dermal (LD_{50} mg/kg)	2,000.1
Species	Rabbit
ATE dermal (mg/kg)	2,000.1

METHYLENE DIPHENYL BIS(DIMETHYL UREA)

Acute toxicity - oral	
Acute toxicity oral (LD_{50} mg/kg)	5,000.0
Species	Rat
ATE oral (mg/kg)	5,000.0
Acute toxicity - dermal	
Acute toxicity dermal (LD_{50} mg/kg)	2,000.1
Species	Rabbit
ATE dermal (mg/kg)	2,000.1

BISPHENOL A EPOXY - CTBN RUBBER ADDUCT

Acute toxicity - oral	
Acute toxicity oral (LD_{50} mg/kg)	2,000.1
Species	Rat
ATE oral (mg/kg)	2,000.1
Acute toxicity - dermal	
Acute toxicity dermal (LD_{50} mg/kg)	2,000.1
Species	Rabbit
ATE dermal (mg/kg)	2,000.1

SECTION 12: Ecological Information

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Ecotoxicity Toxic to aquatic life with long lasting effects.

12.1. Toxicity

Toxicity No data available.

Ecological information on ingredients.

POLYPHENOL CYANATE RESIN

Acute aquatic toxicity

LE(C)$_{50}$	0.1 < L(E)C50 ≤ 1
M factor (Acute)	1
Acute toxicity - fish	LC_{50}, 48 hours: 0.58 mg/l, Oryzias latipes (Red killifish)

Chronic aquatic toxicity

M factor (Chronic)	1

EPOXY RESIN (Number average MW <= 700)

Acute toxicity - fish	LC_{50}, 24 hours: 4.4 mg/l, Onchorhynchus mykiss (Rainbow trout)
Acute toxicity - aquatic invertebrates	LC_{50}, 24 hours: 4.9 mg/l, Daphnia magna
Acute toxicity - aquatic plants	EC_{50}, 48 hours: 9.1 mg/l, Selenastrum capricornutum
Acute toxicity - microorganisms	IC_{50}, 3 hours: > 100 mg/l, Activated sludge
Chronic toxicity - aquatic invertebrates	NOEC, 21 days: 0.3 mg/l, Daphnia magna

METHYLENE DIPHENYL BIS(DIMETHYL UREA)

Acute toxicity - fish	LC_{50}, 96 hours: > 30.2 mg/l, Algae
Acute toxicity - aquatic invertebrates	EC_{50}, 48 hours: > 39.8 mg/l, Daphnia magna
Acute toxicity - aquatic plants	EC_{50}, 96 hours: 29.4 mg/l, Fish

BISPHENOL A EPOXY - CTBN RUBBER ADDUCT

Acute toxicity - fish	LC_{50}, 96 hours: 1 - 100 mg/l, Algae
Acute toxicity - aquatic invertebrates	EC_{50}, 48 hours: 1 - 100 mg/l, Daphnia magna

12.2. Persistence and degradability

Persistence and degradability The product is not readily biodegradable.

Ecological information on ingredients.

POLYPHENOL CYANATE RESIN

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Biodegradation - < 1%: 28 days

EPOXY RESIN (Number average MW <= 700)

Biodegradation Water - 6 - 12%: 28 days

12.3. Bioaccumulative potential

Bioaccumulative potential The product contains potentially bioaccumulating substances.

Partition coefficient Not known.

Ecological information on ingredients.

EPOXY RESIN (Number average MW <= 700)

Bioaccumulative potential BCF: 100 - 3000,

Partition coefficient log Pow: 3.242

METHYLENE DIPHENYL BIS(DIMETHYL UREA)

Bioaccumulative potential log Kow: 1.14,

12.4. Mobility in soil

Mobility No data available. The product has poor water-solubility.

Ecological information on ingredients.

EPOXY RESIN (Number average MW <= 700)

Adsorption/desorption coefficient Water - log Koc: 2.65 @ 20°C

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This substance is not classified as PBT or vPvB according to current EU criteria.

12.6. Other adverse effects

Other adverse effects None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information Waste disposal should be in accordance with existing Community, National and local regulations Empty containers may contain product residue; follow SDS and label warnings even after they have been emptied.

Disposal methods Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

Waste class 08 04 09* waste adhesives and sealants containing organic solvents or other dangerous substances.

SECTION 14: Transport information

Road transport notes Applies only to inner containers >5 litres. See SP 375

Sea transport notes Applies only to inner containers >5 litres. See 2.10.2.7 of the IMDG code.

Air transport notes Applies only to inner containers >5 litres. See SP A197 (375)

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14.1. UN number

3082

14.2. UN proper shipping name

Environmentally hazardous substance, liquid, n.o.s. (contains Epoxy resin)

14.3. Transport hazard class(es)

9

Transport labels

14.4. Packing group

III

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant

14.6. Special precautions for user

Tunnel restriction code (E)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

SECTION 15: Regulatory information

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

National regulations The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 No. 716).

EU legislation Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).
COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Guidance Workplace Exposure Limits EH40.
CHIP for everyone HSG228.
Safety Data Sheets for Substances and Preparations.
Approved Classification and Labelling Guide (Sixth edition) L131.

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

SECTION 16: Other information

Revision date 24/05/2017

Permabond ES5504

Revision	2
Supersedes date	15/06/2015
Hazard statements in full	H315 Causes skin irritation. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H400 Very toxic to aquatic life. H410 Very toxic to aquatic life with long lasting effects. H411 Toxic to aquatic life with long lasting effects. H412 Harmful to aquatic life with long lasting effects.