SAFETY DATA SHEET

ARBOKOL® 682 Curing Agent

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

1.1 Product identifier

Product name : ARBOKOL® 682 Curing Agent

Product description : Curing agent component of: Two-component, epoxy-based adhesive.

Other means of identification : ARBOKOL® 682H Curing Agent, ARBOKOL® 682M Curing Agent

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

Identified uses
Curing agent component of: Two-component, epoxy-based adhesive.

Uses advised against	Reason
For professional users only.	-

1.3 Details of the supplier of the safety data sheet

Adshead Ratcliffe & Co. Ltd.
Derby Road, Belper
Derbyshire.
DE56 1WJ
+44 (0)1773 826661

e-mail address of person responsible for this SDS : SDSQueries@carlisleccm.com

1.4 Emergency telephone number

National advisory body/Poison Centre

Telephone number : National Poisons Information Service (NPIS)
Tel: 0344 892 0111 (for healthcare professionals only)
Website: http://www.npis.org/
Members of Public in England, Scotland and Wales can contact NHS 111/NHS 24 by dialling 111. In Northern Ireland contact your local GP.

Supplier

Telephone number : +44 (0)1773 826661
(Office hours: 8.30 - 17.00)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to UK CLP/GHS

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

The product is classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.

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

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

2.2 Label elements

SECTION 2: Hazards identification

Hazard pictograms :

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

Prevention : P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P273 - Avoid release to the environment.
P261 - Avoid breathing vapour.
P264 - Wash contaminated skin thoroughly after handling.

Response : P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention.
P337 + P313 - If eye irritation persists: Get medical advice/attention.

Storage : Not applicable.

Disposal : Not applicable.

Supplemental label elements : Warning! Hazardous respirable dust may be formed when used. Do not breathe dust.

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

Special packaging requirements

Containers to be fitted with child-resistant fastenings : Not applicable.

Tactile warning of danger : Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII : This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Other hazards which do not result in classification : Curing process may release a small amount of methanol which is irritating to mucous membranes and has skin drying and narcotic effects.

SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	%	Classification	Type
Reaction mass of 2,2'-[methylenebis (2,1-phenyleneoxymethylene)]bis (oxirane) and 2,2'-[methylenebis (4,1-phenyleneoxymethylene)]bis (oxirane)and 2-({2-[4-(oxiran-2-ylmethoxy)benzyl] phenoxy}methyl)oxirane	REACH #: 01-2119454392-40 CAS: 9003-36-5	≥25 - ≤50	Skin Irrit. 2, H315 Skin Sens. 1A, H317 Aquatic Chronic 2, H411	[1]
2,2'-[(1-methylethylidene)bis (4,1-phenyleneoxymethylene)] bisoxirane	REACH #: 01-2119456619-26 EC: 216-823-5	≥25 - ≤50	Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317	[1]

SECTION 3: Composition/information on ingredients

	CAS: 1675-54-3 Index: 603-073-00-2		Aquatic Chronic 2, H411	
Talc	EC: 238-877-9 CAS: 14807-96-6	≥10 - ≤25	Not classified.	[2]
silicon dioxide	REACH #: 01-2119379499-16 EC: 231-545-4 CAS: 7631-86-9	≤5	Not classified.	[2]
hexan-6-olide	REACH #: 01-2119485521-38 EC: 207-938-1 CAS: 502-44-3	≤5	Eye Irrit. 2, H319	[1]
titanium dioxide	REACH #: 01-2119489379-17 EC: 236-675-5 CAS: 13463-67-7 Index: 022-006-00-2	≤3	Not classified.	[2]
[3-(2,3-epoxypropoxy)propyl] trimethoxysilane	REACH #: 01-2119513212-58 EC: 219-784-2 CAS: 2530-83-8	<3	Eye Dam. 1, H318 Aquatic Chronic 3, H412	[1]
ethanediol	REACH #: 01-2119456816-28 EC: 203-473-3 CAS: 107-21-1 Index: 603-027-00-1	<1	Acute Tox. 4, H302 STOT RE 2, H373 (kidneys)	[1] [2]
methanol	EC: 200-659-6 CAS: 67-56-1 Index: 603-001-00-X	<0.1	Flam. Liq. 2, H225 Acute Tox. 3, H301 Acute Tox. 3, H311 Acute Tox. 3, H331 STOT SE 1, H370 **See Section 16 for the full text of the H statements declared above.**	[1] [2]

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

[1] Substance classified with a health or environmental hazard
[2] Substance with a workplace exposure limit

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.

SECTION 4: First aid measures

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-aiders : 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

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 : Antidote for methanol poisoning is ethanol.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : In case of fire, use water spray (fog), foam, dry chemical or CO_2.

Unsuitable extinguishing media : Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : 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 combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
metal oxide/oxides
Toxic gases

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.

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 spilt material. 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 spilt 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 : Move containers from spill area. Avoid dust generation. Using a vacuum with HEPA filter will reduce dust dispersal. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

Large spill : Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

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

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). 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 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) 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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Seveso Directive - Reporting thresholds

Danger criteria

SECTION 7: Handling and storage

Category	Notification and MAPP threshold	Safety report threshold
E2	200 tonne	500 tonne

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

Product/ingredient name	Exposure limit values
Talc	**EH40/2005 WELs (United Kingdom (UK), 1/2020).** TWA: 1 mg/m³ 8 hours. Form: respirable dust
silicon dioxide	**EH40/2005 WELs (United Kingdom (UK), 1/2020). [silica, amorphous inhalable dust/respirable dust]** TWA: 2.4 mg/m³ 8 hours. Form: respirable dust TWA: 6 mg/m³ 8 hours. Form: inhalable dust
titanium dioxide	**EH40/2005 WELs (United Kingdom (UK), 1/2020).** TWA: 4 mg/m³ 8 hours. Form: respirable TWA: 10 mg/m³ 8 hours. Form: total inhalable
ethanediol	**EH40/2005 WELs (United Kingdom (UK), 1/2020). Absorbed through skin.** TWA: 10 mg/m³ 8 hours. Form: Particulate TWA: 20 ppm 8 hours. Form: Vapour STEL: 40 ppm 15 minutes. Form: Vapour TWA: 52 mg/m³ 8 hours. Form: Vapour STEL: 104 mg/m³ 15 minutes. Form: Vapour
methanol	**EH40/2005 WELs (United Kingdom (UK), 1/2020). Absorbed through skin.** STEL: 333 mg/m³ 15 minutes. STEL: 250 ppm 15 minutes. TWA: 266 mg/m³ 8 hours. TWA: 200 ppm 8 hours.

Biological exposure indices

No exposure indices known.

Recommended monitoring procedures : Reference should be made to appropriate monitoring standards. 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
Reaction mass of 2,2'-[methylenebis (2,1-phenyleneoxymethylene)]bis (oxirane) and 2,2'-[methylenebis (4,1-phenyleneoxymethylene)]bis (oxirane)and 2-({2-[4-(oxiran-2-ylmethoxy)benzyl]phenoxy}methyl) oxirane	DNEL	Long term Inhalation	29.39 mg/m³	Workers	Systemic
	DNEL	Long term Dermal	104.15 mg/kg bw/day	Workers	Systemic
	DMEL	Short term Dermal	8.3 µg/cm²	Workers	Local
	DNEL	Long term Inhalation	8.7 mg/m³	General population	Systemic
	DNEL	Long term Dermal	62.5 mg/kg bw/day	General population	Systemic

SECTION 8: Exposure controls/personal protection

	DNEL	Long term Oral	6.25 mg/kg bw/day	General population	Systemic
2,2'-[(1-methylethylidene)bis (4,1-phenyleneoxymethylene)] bisoxirane	DNEL	Long term Dermal	89.3 µg/kg bw/day	General population	Systemic
	DNEL	Long term Oral	0.5 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	0.75 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	0.87 mg/m³	General population	Systemic
	DNEL	Long term Inhalation	4.93 mg/m³	Workers	Systemic
Talc	DNEL	Short term Inhalation	1.08 mg/m³	General population	Systemic
	DNEL	Long term Inhalation	1.08 mg/m³	General population	Systemic
	DNEL	Short term Inhalation	1.8 mg/m³	General population	Local
	DNEL	Long term Inhalation	1.8 mg/m³	General population	Local
	DNEL	Short term Inhalation	2.16 mg/m³	Workers	Systemic
	DNEL	Long term Inhalation	2.16 mg/m³	Workers	Systemic
	DNEL	Long term Dermal	2.27 mg/cm²	General population	Local
	DNEL	Short term Inhalation	3.6 mg/m³	Workers	Local
	DNEL	Long term Inhalation	3.6 mg/m³	Workers	Local
	DNEL	Long term Dermal	4.54 mg/cm²	Workers	Local
	DNEL	Long term Dermal	21.6 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	43.2 mg/kg bw/day	Workers	Systemic
	DNEL	Short term Oral	160 mg/kg bw/day	General population	Systemic
	DNEL	Long term Oral	160 mg/kg bw/day	General population	Systemic
hexan-6-olide	DNEL	Long term Dermal	0.25 mg/kg bw/day	General population	Systemic
	DNEL	Long term Oral	0.3 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	1.02 mg/m³	General population	Systemic
	DNEL	Long term Dermal	1.02 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	4.1 mg/m³	Workers	Systemic
	DNEL	Long term Inhalation	7 mg/m³	Workers	Local
[3-(2,3-epoxypropoxy)propyl] trimethoxysilane	DNEL	Long term Oral	5 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	5 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	10 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	17 mg/m³	General population	Systemic
	DNEL	Long term Inhalation	70.5 mg/m³	Workers	Systemic

SECTION 8: Exposure controls/personal protection

	DNEL	Short term Inhalation	26400 mg/m³	General population	Systemic
ethanediol	DNEL	Long term Inhalation	7 mg/m³	General population	Local
	DNEL	Long term Inhalation	35 mg/m³	Workers	Local
	DNEL	Long term Dermal	53 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	106 mg/kg bw/day	Workers	Systemic
methanol	DNEL	Short term Oral	4 mg/kg bw/day	General population	Systemic
	DNEL	Long term Oral	4 mg/kg bw/day	General population	Systemic
	DNEL	Short term Dermal	4 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	4 mg/kg bw/day	General population	Systemic
	DNEL	Short term Dermal	20 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Dermal	20 mg/kg bw/day	Workers	Systemic
	DNEL	Short term Inhalation	26 mg/m³	General population	Local
	DNEL	Long term Inhalation	26 mg/m³	General population	Local
	DNEL	Short term Inhalation	26 mg/m³	General population	Systemic
	DNEL	Long term Inhalation	26 mg/m³	General population	Systemic
	DNEL	Short term Inhalation	130 mg/m³	Workers	Local
	DNEL	Long term Inhalation	130 mg/m³	Workers	Local
	DNEL	Short term Inhalation	130 mg/m³	Workers	Systemic
	DNEL	Long term Inhalation	130 mg/m³	Workers	Systemic

PNECs

Product/ingredient name	Compartment Detail	Value	Method Detail
Reaction mass of 2,2'-[methylenebis (2,1-phenyleneoxymethylene)]bis(oxirane) and 2,2'-[methylenebis (4,1-phenyleneoxymethylene)]bis(oxirane) and 2-({2-[4-(oxiran-2-ylmethoxy)benzyl] phenoxy}methyl)oxirane	Fresh water	0.003 mg/l	-
	Fresh water	0.025 mg/l	-
	Marine water	0.0003 mg/l	-
	Sewage Treatment Plant	10 mg/l	-
	Fresh water sediment	0.294 mg/kg	-
	Marine water sediment	0.0294 mg/kg	-
	Soil	0.237 mg/kg	-
2,2'-[(1-methylethylidene)bis (4,1-phenyleneoxymethylene)]bisoxirane	Fresh water	0.006 mg/l	-
	Fresh water	0.018 mg/l	-
	Marine water	0.001 mg/l	-
	Marine water	0.002 mg/l	-
	Sewage Treatment Plant	10 mg/l	-
	Fresh water sediment	0.341 mg/kg	-
	Marine water sediment	0.034 mg/kg	-

SECTION 8: Exposure controls/personal protection

	Soil	0.065 mg/kg	-
	Secondary Poisoning	11 mg/kg	-
hexan-6-olide	Fresh water	0.204 mg/l	-
	Fresh water	2.04 mg/l	-
	Marine water	0.0204 mg/l	-
	Sewage Treatment Plant	32 mg/l	-
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	Fresh water	0.45 mg/l	-
	Fresh water	0.45 mg/l	-
	Marine water	0.045 mg/l	-
	Sewage Treatment Plant	8.2 mg/l	-
	Fresh water sediment	1.6 mg/kg dwt	-
	Marine water sediment	1.6 mg/kg dwt	-
	Soil	0.063 mg/kg dwt	-

8.2 Exposure controls

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

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

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties

Appearance

Physical state	:	Solid. [Paste.]
Colour	:	Off-white.
Odour	:	Not available.
Odour threshold	:	Not available.
Melting point/freezing point	:	Not available.
Initial boiling point and boiling range	:	Not available.
Flammability (solid, gas)	:	Not available.
Upper/lower flammability or explosive limits	:	Not applicable.
Flash point	:	Not applicable.
Auto-ignition temperature	:	Not applicable.
Decomposition temperature	:	Not available.
pH	:	Not available.
Viscosity	:	Dynamic: 250000 to 600000 mPa·s
Solubility in water	:	Not available.
Partition coefficient: n-octanol/ water	:	Not applicable.
Vapour pressure	:	Not available.
Relative density	:	1.22 to 1.3
Vapour density	:	Not applicable.
Explosive properties	:	Not available.
Oxidising properties	:	Not available.

Particle characteristics

Median particle size	:	Not available.

SECTION 10: Stability and reactivity

10.1 Reactivity : No specific test data related to reactivity available for this product or its ingredients.

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 : exposure to heat

10.5 Incompatible materials : strong acids
strong alkalis
Strong oxidising materials

10.6 Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Small amounts of toxic methanol are released by hydrolysis.
Decomposition products may include the following materials:
carbon oxides
Toxic gases

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Reaction mass of 2,2'-[methylenebis (2,1-phenyleneoxymethylene)] bis(oxirane) and 2,2'-[methylenebis (4,1-phenyleneoxymethylene)] bis(oxirane)and 2-({2-[4-(oxiran-2-ylmethoxy)benzyl] phenoxy}methyl)oxirane	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
2,2'-[(1-methylethylidene)bis (4,1-phenyleneoxymethylene)] bisoxirane	LD50 Dermal	Rabbit	20 g/kg	-
hexan-6-olide	LD50 Oral	Rat	4290 mg/kg	-
[3-(2,3-epoxypropoxy)propyl] trimethoxysilane	LD50 Oral	Rat	7.01 g/kg	-
ethanediol	LD50 Oral	Rat	4700 mg/kg	-
methanol	LC50 Inhalation Gas.	Rat	145000 ppm	1 hours
	LC50 Inhalation Gas.	Rat	64000 ppm	4 hours
	LD50 Dermal	Rabbit	15800 mg/kg	-
	LD50 Oral	Rat	5600 mg/kg	-

Conclusion/Summary : Based on available data, the classification criteria are not met.

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
2,2'-[(1-methylethylidene)bis (4,1-phenyleneoxymethylene)]bisoxirane	N/A	20000	N/A	N/A	N/A
hexan-6-olide	4290	N/A	N/A	N/A	N/A
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	7010	N/A	N/A	N/A	N/A
ethanediol	500	N/A	N/A	N/A	N/A
methanol	100	300	64000	3	N/A

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
2,2'-[(1-methylethylidene)bis (4,1-phenyleneoxymethylene)] bisoxirane	Eyes - Severe irritant	Rabbit	-	24 hours 2 mg	-
	Skin - Mild irritant	Rabbit	-	500 mg	-
Talc	Skin - Mild irritant	Human	-	72 hours 300 ug l	-
silicon dioxide	Eyes - Mild irritant	Rabbit	-	24 hours 25 mg	-
titanium dioxide	Skin - Mild irritant	Human	-	72 hours 300 ug l	-
[3-(2,3-epoxypropoxy)propyl] trimethoxysilane	Eyes - Mild irritant	Rabbit	-	100 mg	-
	Skin - Mild irritant	Rabbit	-	500 mg	-
ethanediol	Eyes - Mild irritant	Rabbit	-	1 hours 100 mg	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Eyes - Moderate irritant	Rabbit	-	6 hours 1440 mg	-
	Skin - Mild irritant	Rabbit	-	555 mg	-
methanol	Eyes - Moderate irritant	Rabbit	-	24 hours 100	-

SECTION 11: Toxicological information

	Eyes - Moderate irritant Skin - Moderate irritant	Rabbit Rabbit	- -	mg 40 mg 24 hours 20 mg	- -

Conclusion/Summary

Skin : Skin Irrit. 2

Eyes : Eye Irrit. 2

Respiratory : Based on available data, the classification criteria are not met.

Sensitisation

Conclusion/Summary

Skin : Skin Sens. 1

Respiratory : Based on available data, the classification criteria are not met.

Mutagenicity

Conclusion/Summary : Based on available data, the classification criteria are not met.

Carcinogenicity

Based on available data, the classification criteria are not met.

Conclusion/Summary : Based on available data, the classification criteria are not met.

Reproductive toxicity

Conclusion/Summary : Based on available data, the classification criteria are not met.

Teratogenicity

Conclusion/Summary : Based on available data, the classification criteria are not met.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
methanol	Category 1	-	-

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
ethanediol	Category 2	-	kidneys

Aspiration hazard

Not available.

Information on likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

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.

SECTION 11: Toxicological information

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

Short term exposure

Potential immediate effects : Causes skin irritation.
Causes serious eye irritation.
May cause skin sensitisation.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

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.

Other information : Curing process may release a small amount of methanol which is irritating to mucous membranes and has skin drying and narcotic effects.

Product may hydrolyse in the gastrointestinal tract to produce methanol. Toxic effects of methanol include eye damage and blindness, metabolic acidosis, dizziness and drowsiness.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
Reaction mass of 2,2'-[methylenebis (2,1-phenyleneoxymethylene)] bis(oxirane) and 2,2'-[methylenebis (4,1-phenyleneoxymethylene)] bis(oxirane)and 2-({2-[4-(oxiran-2-ylmethoxy)benzyl] phenoxy}methyl)oxirane	Acute EC50 >1.8 mg/l Fresh water	Algae - *Raphidocelis subcapitata*	72 hours
	Acute EC50 2.55 mg/l Fresh water	Daphnia - *Daphnia magna*	48 hours
	Acute LC50 2.54 mg/l Fresh water	Fish	96 hours
	Chronic NOEC 0.3 mg/l Fresh water	Daphnia - *Daphnia magna*	21 days
2,2'-[(1-methylethylidene)bis (4,1-phenyleneoxymethylene)] bisoxirane	Acute EC50 >11 mg/l Fresh water	Algae - *Scenedesmus capricornutum*	72 hours
	Acute EC50 1.8 mg/l Fresh water	Daphnia - *Daphnia magna*	48 hours
	Acute LC50 1.5 mg/l Fresh water	Fish - *Oncorhynchus mykiss*	96 hours
	Chronic NOEC 4.2 mg/l Fresh water	Algae - *Scenedesmus capricornutum*	72 hours
	Chronic NOEC 0.3 mg/l Fresh water	Daphnia - *Daphnia magna*	21 days
silicon dioxide	Acute EC50 2.2 g/L Fresh water	Daphnia - Water flea - *Daphnia magna* - Neonate	48 hours
	Chronic NOEC 12.5 mg/l Fresh water	Daphnia - Water flea - *Daphnia magna* - Neonate	21 days
titanium dioxide	Acute LC50 3 mg/l Fresh water	Crustaceans - Water flea - *Ceriodaphnia dubia* - Neonate	48 hours
	Acute LC50 6.5 mg/l Fresh water	Daphnia - Water flea - *Daphnia*	48 hours

SECTION 12: Ecological information

		pulex - Neonate	
	Acute LC50 >1000000 µg/l Marine water	Fish - Mummichog - *Fundulus heteroclitus*	96 hours
ethanediol	Acute LC50 6900000 µg/l Fresh water	Crustaceans - Water flea - *Ceriodaphnia dubia* - Neonate	48 hours
	Acute LC50 41000 mg/l Fresh water	Daphnia - Water flea - *Daphnia magna* - Neonate	48 hours
	Acute LC50 8050000 µg/l Fresh water	Fish - Fathead minnow - *Pimephales promelas*	96 hours
methanol	Acute EC50 16.912 mg/l Marine water	Algae - Green algae - *Ulva pertusa*	96 hours
	Acute LC50 2500000 µg/l Marine water	Crustaceans - Common shrimp, sand shrimp - *Crangon crangon* - Adult	48 hours
	Acute LC50 3289 mg/l Fresh water	Daphnia - Water flea - *Daphnia magna* - Neonate	48 hours
	Acute LC50 290 mg/l Fresh water	Fish - Zebra danio - *Danio rerio* - Egg	96 hours
	Chronic NOEC 9.96 mg/l Marine water	Algae - Green algae - *Ulva pertusa*	96 hours

Conclusion/Summary : Aquatic Chronic 2

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
ethanediol	-	>90 % - Readily - 10 days	-	-

Conclusion/Summary : Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Reaction mass of 2,2'-[methylenebis (2,1-phenyleneoxymethylene)] bis(oxirane) and 2,2'-[methylenebis (4,1-phenyleneoxymethylene)] bis(oxirane)and 2-({2-[4-(oxiran-2-ylmethoxy)benzyl] phenoxy}methyl)oxirane	-	-	Not readily
2,2'-[(1-methylethylidene)bis (4,1-phenyleneoxymethylene)] bisoxirane	-	-	Not readily
ethanediol	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
hexan-6-olide	0.32	-	Low
ethanediol	-1.36	-	Low
methanol	-0.77	<10	Low

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Mobility : insoluble in water.

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.

SECTION 12: Ecological information

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

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised 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 : Yes.

Waste catalogue

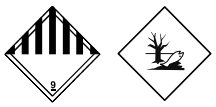
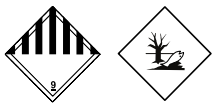
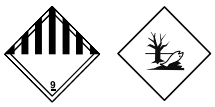
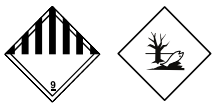
Waste code	Waste designation
08 04 09*	waste adhesives and sealants containing organic solvents or other hazardous substances

Packaging

Methods of disposal : The generation of waste should be avoided or minimised 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 spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	UN3077	UN3077	UN3077	UN3077
14.2 UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (epoxy resins)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (epoxy resins)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (epoxy resins)	Environmentally hazardous substance, solid, n.o.s. (epoxy resins)
14.3 Transport hazard class(es)	9 	9 	9 	9 
14.4 Packing group	III	III	III	III
14.5 Environmental hazards	Yes.	Yes.	Yes.	Yes.

Additional information

ADR/RID : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.
Hazard identification number 90
Limited quantity 5 kg
Special provisions 274, 335, 601, 375
Tunnel code (-)

SECTION 14: Transport information

ADN : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.
Special provisions 274, 335, 375, 601

IMDG : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.
Emergency schedules F-A, S-F
Special provisions 274, 335, 966, 967, 969

IATA : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.
Quantity limitation Passenger and Cargo Aircraft: 400 kg. Packaging instructions: 956. Cargo Aircraft Only: 400 kg. Packaging instructions: 956. Limited Quantities - Passenger Aircraft: 30 kg. Packaging instructions: Y956.
Special provisions A97, A158, A179, A197, A215

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 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

UK (GB)/REACH

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Ozone depleting substances

Not listed.

Prior Informed Consent (PIC)

Not listed.

Persistent Organic Pollutants

Not listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Product/ingredient name	%	Designation [Usage]
methanol	<0.1	69

Labelling : Not applicable.

Seveso Directive

This product is controlled under the Seveso Directive.

Danger criteria

Category
E2

EU regulations

SECTION 15: Regulatory information

Industrial emissions (integrated pollution prevention and control) - Air : Not listed

Industrial emissions (integrated pollution prevention and control) - Water : Not listed

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : Not determined.

Canada : Not determined.

China : Not determined.

Eurasian Economic Union : **Russian Federation inventory**: Not determined.

Japan : **Japan inventory (CSCL)**: Not determined.
Japan inventory (ISHL): Not determined.

New Zealand : Not determined.

Philippines : Not determined.

Republic of Korea : Not determined.

Taiwan : Not determined.

Thailand : Not determined.

Turkey : Not determined.

United States : Not determined.

Viet Nam : Not determined.

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

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
GB CLP = UK CLP (EC No 1272/2008) on the Classification, Labelling and Packaging of Substances and Mixtures as amended by (EU Exit) Regulations 2019 No. 720 and amendments
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = GB 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

SECTION 16: Other information

Procedure used to derive the classification

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

H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H370	Causes damage to organs.
H373	May cause damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Full text of classifications

Acute Tox. 3	ACUTE TOXICITY - Category 3
Acute Tox. 4	ACUTE TOXICITY - Category 4
Aquatic Chronic 2	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2
Aquatic Chronic 3	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3
Eye Dam. 1	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Flam. Liq. 2	FLAMMABLE LIQUIDS - Category 2
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2
Skin Sens. 1	SKIN SENSITISATION - Category 1
Skin Sens. 1A	SKIN SENSITISATION - Category 1A
STOT RE 2	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
STOT SE 1	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 1

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