Safety Data Sheet

Document group:	38-4058-4	**Version number:**	1.03
Revision date:	10/10/2019	**Supersedes date:**	23/08/2019

Transportation version number: 1.01 (20/02/2019)

This Safety Data Sheet has been prepared in accordance with the REACH Regulation (EC) 1907/2006 and its modifications.

IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier
3M™ Thermally Conductive Adhesive TC-2810

Product Identification Numbers
XA-0068-0025-5

7100170986

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

Identified uses
Conductive adhesive

1.3. Details of the supplier of the safety data sheet

Address:	3M United Kingdom PLC, 3M Centre, Cain Road, Bracknell, Berkshire, RG12 8HT.
Telephone:	+44 (0)1344 858 000
E Mail:	tox.uk@mmm.com
Website:	www.3M.com/uk

1.4. Emergency telephone number
+44 (0)1344 858 000

This product is a kit or a multipart product which consists of multiple, independently packaged components. A Safety Data Sheet for each of these components is included. Please do not separate the component Safety Data Sheets from this cover page. The document numbers of the MSDSs for components of this product are:

16-3330-4, 38-3989-1

TRANSPORTATION INFORMATION

XA-0068-0025-5

ADR/RID: UN2735, AMINES, LIQUID, CORROSIVE, N.O.S. LIMITED QUANTITY, (4,7,10-TRIOXATRIDECANE-1,13-DIAMINE), 8., II , (E), ADR Classification Code: C7.
IMDG-CODE: UN2735, AMINE, LIQUID, CORROSIVE, N.O.S., (4,7,10-TRIOXATRIDECANE-1,13-DIAMINE), 8., II ,

IMDG-Code segregation code: 18- ALKALIS, LIMITED QUANTITY, EMS: F-AS-B.
ICAO/IATA: UN2735, AMINES, LIQUID, CORROSIVE, N.O.S., (4,7,10-TRIOXATRIDECANE-1,13-DIAMINE), 8., II .

KIT LABEL

2.1. Classification of the substance or mixture
CLP REGULATION (EC) No 1272/2008

CLASSIFICATION:
Serious Eye Damage/Eye Irritation, Category 1 - Eye Dam. 1; H318
Skin Corrosion/Irritation, Category 1B - Skin Corr. 1B; H314
Skin Sensitization, Category 1 - Skin Sens. 1; H317
Hazardous to the Aquatic Environment (Chronic), Category 2 - Aquatic Chronic 2; H411

For full text of H phrases, see Section 16.

2.2. Label elements
CLP REGULATION (EC) No 1272/2008

SIGNAL WORD
DANGER.

Symbols:
GHS05 (Corrosion) | GHS07 (Exclamation mark) |GHS09 (Environment) |

Pictograms

Contains:
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane; 3,3'-Oxybis(ethyleneoxy)bis(propylamine); 2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorhydrin

HAZARD STATEMENTS:

H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H411	Toxic to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS

Prevention:

P260A	Do not breathe vapours.
P280D	Wear protective gloves, protective clothing, and eye/face protection.

Response:

P303 + P361 + P353A	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTRE or doctor/physician.

Disposal:

P501	Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

For containers not exceeding 125 ml the following Hazard and Precautionary statements may be used:

<=125 ml Hazard statements

H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.

<=125 ml Precautionary statements

Prevention:

P260A	Do not breathe vapours.
P280D	Wear protective gloves, protective clothing, and eye/face protection.

Response:

P303 + P361 + P353A	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTRE or doctor/physician.

Refer to Safety Data Sheet for component % unknown values (www.3M.com/msds).

Revision information:
Label: CLP Ingredients - kit components information was modified.

Safety Data Sheet

Document group:	16-3330-4	**Version number:**	7.02
Revision date:	04/09/2019	**Supersedes date:**	15/02/2019

Transportation version number: 1.00 (08/02/2011)

This Safety Data Sheet has been prepared in accordance with the REACH Regulation (EC) 1907/2006 and its modifications.

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

1.1. Product identifier
3M™ Thermally Conductive Epoxy Adhesive TC-2810 (Part A)

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

Identified uses
Conductive adhesive.

1.3. Details of the supplier of the safety data sheet

Address:	3M United Kingdom PLC, 3M Centre, Cain Road, Bracknell, Berkshire, RG12 8HT.
Telephone:	+44 (0)1344 858 000
E Mail:	tox.uk@mmm.com
Website:	www.3M.com/uk

1.4. Emergency telephone number
+44 (0)1344 858 000

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture
CLP REGULATION (EC) No 1272/2008

CLASSIFICATION:
Serious Eye Damage/Eye Irritation, Category 1 - Eye Dam. 1; H318
Skin Corrosion/Irritation, Category 1B - Skin Corr. 1B; H314
Skin Sensitization, Category 1 - Skin Sens. 1; H317
Hazardous to the Aquatic Environment (Chronic), Category 3 - Aquatic Chronic 3; H412

For full text of H phrases, see Section 16.

2.2. Label elements
CLP REGULATION (EC) No 1272/2008

SIGNAL WORD
DANGER.

Symbols:
GHS05 (Corrosion) | GHS07 (Exclamation mark) |

Pictograms

Ingredients:

Ingredient	CAS Nbr	EC No.	% by Wt
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	4246-51-9	224-207-2	40 - 50
2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorhydrin	68610-41-3		10 - 30
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	216-823-5	1 - 10

HAZARD STATEMENTS:

H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H412	Harmful to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS

Prevention:

P260A	Do not breathe vapours.
P280D	Wear protective gloves, protective clothing, and eye/face protection.

Response:

P303 + P361 + P353A	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTRE or doctor/physician.

Disposal:

P501	Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

For containers not exceeding 125 ml the following Hazard and Precautionary statements may be used:

<=125 ml Hazard statements

H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H412	Harmful to aquatic life with long lasting effects.

<=125 ml Precautionary statements

Prevention:

P260A	Do not breathe vapours.
P280D	Wear protective gloves, protective clothing, and eye/face protection.

Response:

P303 + P361 + P353A	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTRE or doctor/physician.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.

Contains 18% of components with unknown hazards to the aquatic environment.

2.3. Other hazards

None known.

SECTION 3: Composition/information on ingredients

Ingredient	CAS Nbr	EC No.	REACH Registration No.	% by Wt	Classification
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	4246-51-9	224-207-2	01-2119963377-26	40 - 50	Skin Sens. 1, H317 Skin Corr. 1B, H314
2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorhydrin	68610-41-3			10 - 30	Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1B, H317
Boron Nitride (BN)	10043-11-5	233-136-6		15 - 30	Substance not classified as hazardous
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	216-823-5		1 - 10	Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317 Aquatic Chronic 2, H411
Silane, trimethoxyoctyl-, hydrolysis products with silica	92797-60-9	296-597-2		1 - 5	Substance with a Community level exposure limit in the workplace
2,4,6-Tris(dimethylaminomethyl)phenol	90-72-2	202-013-9	01-2119560597-27	< 3	Acute Tox. 4, H302 Skin Corr. 1C, H314; Eye Dam. 1, H318

Please see section 16 for the full text of any H statements referred to in this section

For information on ingredient occupational exposure limits or PBT or vPvB status, see sections 8 and 12 of this SDS

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation
Remove person to fresh air. If you feel unwell, get medical attention.

Skin contact
Immediately flush with large amounts of water for at least 15 minutes. Remove contaminated clothing. Get immediate

medical attention. Wash clothing before reuse.

Eye contact
Immediately flush with large amounts of water for at least 15 minutes. Remove contact lenses if easy to do. Continue rinsing. Immediately get medical attention.

If swallowed
Rinse mouth. Do not induce vomiting. Get immediate medical attention.

4.2. Most important symptoms and effects, both acute and delayed
See Section 11.1 Information on toxicological effects

4.3. Indication of any immediate medical attention and special treatment required
Not applicable

SECTION 5: Fire-fighting measures

5.1. Extinguishing media
In case of fire: Use a fire fighting agent suitable for ordinary combustible material such as water or foam to extinguish.

5.2. Special hazards arising from the substance or mixture
None inherent in this product.

Hazardous Decomposition or By-Products

Substance	Condition
Aldehydes.	During combustion.
Carbon monoxide.	During combustion.
Carbon dioxide.	During combustion.
Hydrogen Chloride	During combustion.

5.3. Advice for fire-fighters
When fire fighting conditions are severe and total thermal decomposition of the product is possible, wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus,tunic and trousers (leggings),bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapours, in accordance with good industrial hygiene practice. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions
Avoid release to the environment. For larger spills, cover drains and build dykes to prevent entry into sewer systems or bodies of water.

6.3. Methods and material for containment and cleaning up
Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible. Place in a metal container approved for use in transportation by appropriate authorities. The container must be lined with polyethylene plastic or contain a plastic drum liner made of polyethylene. Clean up residue with an appropriate solvent selected by a qualified and authorised person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and Safety Data Sheet. Seal the container. Dispose of collected material as soon as possible.

6.4. Reference to other sections
Refer to Section 8 and Section 13 for more information

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Avoid breathing of vapours created during the cure cycle. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Avoid contact with oxidising agents (eg. chlorine, chromic acid etc.)

7.2. Conditions for safe storage including any incompatibilities
Store away from acids. Store away from oxidising agents.

7.3. Specific end use(s)
See information in Section 7.1 and 7.2 for handling and storage recommendations. See Section 8 for exposure controls and personal protection recommendations.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits
If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	CAS Nbr	Agency	Limit type	Additional comments
Silicon dioxide	92797-60-9	UK HSC	TWA(as inhalable dust):6 mg/m3;TWA(as respirable dust):2.4 mg/m3	

UK HSC : UK Health and Safety Commission
TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

Biological limit values
No biological limit values exist for any of the components listed in Section 3 of this safety data sheet.

Derived no effect level (DNEL)

Ingredient	Degradation Product	Population	Human exposure pattern	DNEL
2,4,6-Tris(dimethylaminomethyl)phenol		Worker	Inhalation, Long-term exposure (8 hours), Systemic effects	0.31 mg/m³
3,3'-Oxybis(ethyleneoxy)bis(propylamine)		Worker	Dermal, Long-term exposure (8 hours), Systemic effects	8.3 mg/kg bw/d
3,3'-Oxybis(ethyleneoxy)bis(propylamine)		Worker	Inhalation, Long-term exposure (8 hours), Local effects	1 mg/m³
3,3'-Oxybis(ethyleneoxy)bis(propylamine)		Worker	Inhalation, Long-term exposure (8 hours), Systemic effects	59 mg/m³
3,3'-Oxybis(ethyleneoxy)bis(propylamine)		Worker	Inhalation, Short-term exposure, Local effects	13 mg/m³

3,3'-Oxybis(ethyleneoxy)bis(propylamine)		Worker	Inhalation, Short-term exposure, Systemic effects	176 mg/m³

Predicted no effect concentrations (PNEC)

Ingredient	Degradation Product	Compartment	PNEC
2,4,6-Tris(dimethylaminomethyl)phenol		Freshwater	0.084 mg/l
2,4,6-Tris(dimethylaminomethyl)phenol		Intermittent releases to water	0.84 mg/l
2,4,6-Tris(dimethylaminomethyl)phenol		Marine water	0.0084 mg/l
2,4,6-Tris(dimethylaminomethyl)phenol		Sewage Treatment Plant	0.2 mg/l
3,3'-Oxybis(ethyleneoxy)bis(propylamine)		Freshwater	0.22 mg/l
3,3'-Oxybis(ethyleneoxy)bis(propylamine)		Freshwater sediments	0.809 mg/kg d.w.
3,3'-Oxybis(ethyleneoxy)bis(propylamine)		Intermittent releases to water	2.2 mg/l
3,3'-Oxybis(ethyleneoxy)bis(propylamine)		Marine water	0.022 mg/l
3,3'-Oxybis(ethyleneoxy)bis(propylamine)		Marine water sediments	0.0809 mg/kg d.w.
3,3'-Oxybis(ethyleneoxy)bis(propylamine)		Sewage Treatment Plant	125 mg/l

Recommended monitoring procedures: Information on recommended monitoring procedures can be obtained from UK HSC

8.2. Exposure controls

In addition, refer to the annex for more information.

8.2.1. Engineering controls

Provide ventilated enclosure for heat curing. Curing enclosures must be exhausted to outdoors or to a suitable emission control device. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapours/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:
Full face shield.
Indirect vented goggles.

Applicable Norms/Standards
Use eye/face protection conforming to EN 166

Skin/hand protection
Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing. Note: Nitrile gloves may be worn over polymer laminate gloves to improve dexterity.
Gloves made from the following material(s) are recommended:

Material	Thickness (mm)	Breakthrough Time
Polymer laminate	No data available	No data available

Applicable Norms/Standards
Use gloves tested to EN 374

If this product is used in a manner that presents a higher potential for exposure (eg. spraying, high splash potential etc.), then use of protective coveralls may be necessary. Select and use body protection to prevent contact based on the results of an exposure assessment. The following protective clothing material(s) are recommended: Apron - polymer laminate

Respiratory protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:
Half facepiece or full facepiece air-purifying respirator suitable for organic vapours and particulates

For questions about suitability for a specific application, consult with your respirator manufacturer.

Applicable Norms/Standards
Use a respirator conforming to EN 140 or EN 136: filter types A & P

8.2.3. Environmental exposure controls
Refer to Annex

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	
Physical state	Liquid.
Colour	White
Specific Physical Form:	Paste
Odor	Epoxy
Odour threshold	*No data available.*
pH	*Not applicable.*
Boiling point/boiling range	>=120 ºC
Melting point	*No data available.*
Flammability (solid, gas)	Not applicable.

Explosive properties	Not classified
Oxidising properties	Not classified
Flash point	>=120 ºC [*Test Method:*Estimated]
Autoignition temperature	*No data available.*
Flammable Limits(LEL)	*No data available.*
Flammable Limits(UEL)	*No data available.*
Vapour pressure	<=0.3 Pa [@ 20 ºC]
Relative density	1.34 [*Ref Std:*WATER=1]
Water solubility	Negligible
Solubility- non-water	*No data available.*
Partition coefficient: n-octanol/water	*No data available.*
Evaporation rate	*Not applicable.*
Vapour density	Negligible
Decomposition temperature	*No data available.*
Viscosity	150,000 mPa-s [@ 20 ºC]
Density	1.34 g/ml

9.2. Other information

EU Volatile Organic Compounds	*No data available.*
Percent volatile	0 % weight

SECTION 10: Stability and reactivity

10.1 Reactivity
This material may be reactive with certain agents under certain conditions - see the remaining headings in this section

10.2 Chemical stability
Stable.

10.3 Possibility of hazardous reactions
Hazardous polymerisation will not occur.

10.4 Conditions to avoid
Heat is generated during cure. Do not cure a mass larger than 50 grams in a confined space to prevent a premature exothermic reaction with production of intense heat and smoke.

10.5 Incompatible materials
Strong acids.
Strong oxidising agents.

10.6 Hazardous decomposition products

Substance	Condition
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

SECTION 11: Toxicological information

The information below may not agree with the EU material classification in Section 2 and/or the ingredient classifications in Section 3 if specific ingredient classifications are mandated by a competent authority. In addition, statements and data presented in Section 11 are based on UN GHS calculation rules and classifications derived from 3M assessments.

11.1 Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation
Respiratory tract irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Skin contact
May be harmful in contact with skin. Corrosive (skin burns): Signs/symptoms may include localised redness, swelling, itching, intense pain, blistering, ulceration, and tissue destruction. Allergic skin reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

Eye contact
Corrosive (eye burns): Signs/symptoms may include cloudy appearance of the cornea, chemical burns, severe pain, tearing, ulcerations, significantly impaired vision or complete loss of vision.

Ingestion
Gastrointestinal corrosion: Signs/symptoms may include severe mouth, throat and abdominal pain, nausea, vomiting, and diarrhea; blood in the faeces and/or vomitus may also be seen.

Toxicological Data
If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Dermal		No data available; calculated ATE2,000 - 5,000 mg/kg
Overall product	Ingestion		No data available; calculated ATE >5,000 mg/kg
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	Dermal	Rabbit	LD50 2,500 mg/kg
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	Ingestion	Rat	LD50 3,160 mg/kg
Boron Nitride (BN)	Dermal	Rabbit	LD50 > 20,000 mg/kg
Boron Nitride (BN)	Ingestion	Rat	LD50 > 50,000 mg/kg
2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorhydrin	Dermal	Not available	LD50 3,000 mg/kg
2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorhydrin	Ingestion	Not available	LD50 > 34,000 mg/kg
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Dermal	Rat	LD50 > 1,600 mg/kg
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Ingestion	Rat	LD50 > 1,000 mg/kg
Silane, trimethoxyoctyl-, hydrolysis products with silica	Dermal		LD50 estimated to be > 5,000 mg/kg
Silane, trimethoxyoctyl-, hydrolysis products with silica	Ingestion	Rat	LD50 > 5,340 mg/kg
2,4,6-Tris(dimethylaminomethyl)phenol	Dermal	Rat	LD50 1,280 mg/kg
2,4,6-Tris(dimethylaminomethyl)phenol	Ingestion	Rat	LD50 1,000 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	Rabbit	Corrosive
2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorhydrin	similar compounds	Irritant
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Rabbit	Mild irritant
2,4,6-Tris(dimethylaminomethyl)phenol	Rabbit	Corrosive

Serious Eye Damage/Irritation

Name	Species	Value
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	similar health hazards	Corrosive
2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorhydrin	similar compounds	Severe irritant
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Rabbit	Moderate irritant
2,4,6-Tris(dimethylaminomethyl)phenol	Rabbit	Corrosive

Skin Sensitisation

Name	Species	Value
2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorhydrin	similar compounds	Sensitising
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Human and animal	Sensitising
2,4,6-Tris(dimethylaminomethyl)phenol	Guinea pig	Not classified

Respiratory Sensitisation

Name	Species	Value
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Human	Not classified

Germ Cell Mutagenicity

Name	Route	Value
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	In vivo	Not mutagenic
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	In Vitro	Some positive data exist, but the data are not sufficient for classification
2,4,6-Tris(dimethylaminomethyl)phenol	In Vitro	Not mutagenic

Carcinogenicity

Name	Route	Species	Value
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Dermal	Mouse	Some positive data exist, but the data are not sufficient for classification

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test result	Exposure Duration
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Ingestion	Not classified for female reproduction	Rat	NOAEL 750 mg/kg/day	2 generation
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Ingestion	Not classified for male reproduction	Rat	NOAEL 750 mg/kg/day	2 generation
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Dermal	Not classified for development	Rabbit	NOAEL 300 mg/kg/day	during organogenesis
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Ingestion	Not classified for development	Rat	NOAEL 750 mg/kg/day	2 generation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
3,3'-	Inhalation	respiratory irritation	Some positive data exist, but the		NOAEL Not	

Oxybis(ethyleneoxy)bis(propylamine)			data are not sufficient for classification		available	
2,4,6-Tris(dimethylaminomethyl)phenol	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification		NOAEL Not available	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Dermal	liver	Not classified	Rat	NOAEL 1,000 mg/kg/day	2 years
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Dermal	nervous system	Not classified	Rat	NOAEL 1,000 mg/kg/day	13 weeks
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Ingestion	auditory system | heart | endocrine system | hematopoietic system | liver | eyes | kidney and/or bladder	Not classified	Rat	NOAEL 1,000 mg/kg/day	28 days
2,4,6-Tris(dimethylaminomethyl)phenol	Dermal	skin | liver | nervous system | auditory system | hematopoietic system | eyes	Not classified	Rat	NOAEL 125 mg/kg/day	28 days

Aspiration Hazard
For the component/components, either no data is currently available or the data is not sufficient for classification.

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

The information below may not agree with the EU material classification in Section 2 and/or the ingredient classifications in Section 3 if specific ingredient classifications are mandated by a competent authority. In addition, statements and data presented in Section 12 are based on UN GHS calculation rules and classifications derived from 3M assessments.

12.1. Toxicity

No product test data available.

Material	CAS #	Organism	Type	Exposure	Test endpoint	Test result
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	4246-51-9	Golden Orfe	Experimental	96 hours	LC50	>1,000 mg/l
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	4246-51-9	Green algae	Experimental	72 hours	EC50	>500 mg/l
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	4246-51-9	Water flea	Experimental	48 hours	EC50	218.16 mg/l
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	4246-51-9	Green algae	Experimental	72 hours	Effect Concentration 10%	5.4 mg/l
2-Propenenitrile, polymer with 1,3-butadiene, carboxy-	68610-41-3		Data not available or insufficient for classification			

terminated, polymers with bisphenol A and epichlorhydrin						
Boron Nitride (BN)	10043-11-5	Rainbow trout	Experimental		LC50	>100 mg/l
Boron Nitride (BN)	10043-11-5	Water flea	Experimental		EC50	>100 mg/l
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Rainbow trout	Estimated	96 hours	LC50	2 mg/l
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Water flea	Estimated	48 hours	EC50	1.8 mg/l
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Green Algae	Experimental	72 hours	EC50	>11 mg/l
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Green Algae	Experimental	72 hours	NOEC	4.2 mg/l
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Water flea	Experimental	21 days	NOEC	0.3 mg/l
Silane, trimethoxyoctyl-, hydrolysis products with silica	92797-60-9	Algae	Experimental	72 hours	EC50	>=10,000 mg/l
Silane, trimethoxyoctyl-, hydrolysis products with silica	92797-60-9	Water flea	Experimental	24 hours	NOEC	>=10,000 mg/l
Silane, trimethoxyoctyl-, hydrolysis products with silica	92797-60-9	Zebra Fish	Experimental	96 hours	NOEC	>=10,000 mg/l
2,4,6-Tris(dimethylaminomethyl)phenol	90-72-2	Common Carp	Experimental	96 hours	LC50	175 mg/l
2,4,6-Tris(dimethylaminomethyl)phenol	90-72-2	Grass Shrimp	Experimental	96 hours	LC50	718 mg/l
2,4,6-Tris(dimethylaminomethyl)phenol	90-72-2	Green algae	Experimental	72 hours	EC50	84 mg/l
2,4,6-Tris(dimethylaminomethyl)phenol	90-72-2	Green algae	Experimental	72 hours	NOEC	6.25 mg/l

12.2. Persistence and degradability

Material	CAS Nbr	Test type	Duration	Study Type	Test result	Protocol
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	4246-51-9	Estimated Photolysis		Photolytic half-life (in air)	2.96 hours (t 1/2)	Other methods
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	4246-51-9	Experimental Biodegradation	25 days	CO2 evolution	-8 %CO2 evolution/THCO2 evolution	OECD 301B - Modified sturm or CO2
2-Propenenitrile, polymer	68610-41-3	Data not availbl-			N/A	

with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorhydrin		insufficient				
Boron Nitride (BN)	10043-11-5	Data not availbl-insufficient			N/A	
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Experimental Hydrolysis		Hydrolytic half-life	117 hours (t 1/2)	Other methods
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Experimental Biodegradation	28 days	BOD	5 %BOD/COD	OECD 301F - Manometric respirometry
Silane, trimethoxyoctyl-, hydrolysis products with silica	92797-60-9	Data not availbl-insufficient			N/A	
2,4,6-Tris(dimethylaminomethyl) phenol	90-72-2	Experimental Biodegradation	28 days	BOD	4 % weight	OECD 301D - Closed bottle test

12.3 : Bioaccumulative potential

Material	Cas No.	Test type	Duration	Study Type	Test result	Protocol
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	4246-51-9	Experimental Bioconcentration		Log Kow	-1.25	Other methods
2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorhydrin	68610-41-3	Data not available or insufficient for classification	N/A	N/A	N/A	N/A
Boron Nitride (BN)	10043-11-5	Data not available or insufficient for classification	N/A	N/A	N/A	N/A
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Experimental Bioconcentration		Log Kow	3.242	Other methods
Silane, trimethoxyoctyl-, hydrolysis products with silica	92797-60-9	Data not available or insufficient for classification	N/A	N/A	N/A	N/A
2,4,6-Tris(dimethylaminomethyl) phenol	90-72-2	Experimental Bioconcentration		Log Kow	-0.66	Other methods

12.4. Mobility in soil
Please contact manufacturer for more details

12.5. Results of the PBT and vPvB assessment

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

12.6. Other adverse effects
No information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of completely cured (or polymerized) material in a permitted industrial waste facility. As a disposal alternative,

incinerate uncured product in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Combustion products will include halogen acid (HCl/HF/HBr). Facility must be capable of handling halogenated materials. If no other disposal options are available, waste product that has been completely cured or polymerised may be placed in a landfill properly designed for industrial waste. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

The coding of a waste stream is based on the application of the product by the consumer. Since this is out of the control of 3M, no waste code(s) for products after use will be provided. Please refer to the European Waste Code (EWC - 2000/532/EC and amendments) to assign the correct waste code to your waste stream. Ensure national and/or regional regulations are complied with and always use a licensed waste contractor.

EU waste code (product as sold)

08 04 09*	Waste adhesives and sealants containing organic solvents or other dangerous substances
20 01 27*	Paint, inks, adhesives and resins containing dangerous substances

SECTION 14: Transportation information

IATA: UN2735; Amines, Liquid, Corrosive, N.O.S (4,7,10-Trioxatridecane-1,13-Diamine); 8; II.
ADR: UN2735; Amines, Liquid, Corrosive, N.O.S (4,7,10-Trioxatridecane-1,13-Diamine); 8; II; (E); C7.
IMDG: UN2735; Amines, Liquid, Corrosive, N.O.S (4,7,10-Trioxatridecane-1,13-Diamine); 8; II; FA, SB.

SECTION 15: Regulatory information

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

Carcinogenicity

Ingredient	CAS Nbr	Classification	Regulation
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Gr. 3: Not classifiable	International Agency for Research on Cancer

15.2. Chemical Safety Assessment

A chemical safety assessment has not been carried out for this mixture. Chemical safety assessments for the contained substances may have been carried out by the registrants of the substances in accordance with Regulation (EC) No 1907/2006, as amended.

SECTION 16: Other information

List of relevant H statements

H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Revision information:
CLP: Ingredient table information was modified.
Label: CLP Precautionary - Disposal information was added.
Label: CLP Precautionary - Response information was modified.
Section 3: Composition/ Information of ingredients table information was modified.
Section 5: Fire - Advice for fire fighters information information was modified.
Section 09: Color information was added.
Section 09: Odor information was added.
Sections 3 and 9: Odour, colour, grade information information was deleted.
Section 11: Acute Toxicity table information was modified.
Section 11: Carcinogenicity Table information was modified.
Section 11: Germ Cell Mutagenicity Table information was modified.
Section 11: Reproductive Toxicity Table information was modified.
Section 11: Respiratory Sensitization Table information was modified.
Section 11: Serious Eye Damage/Irritation Table information was modified.
Section 11: Skin Corrosion/Irritation Table information was modified.
Section 11: Skin Sensitization Table information was modified.
Section 11: Target Organs - Repeated Table information was modified.
Section 12: Component ecotoxicity information information was modified.
Section 12: Persistence and Degradability information information was modified.
Section 12:Bioccumulative potential information information was modified.
Section 13: Standard Phrase Category Waste GHS information was modified.
Section 14: Transportation classification information was modified.
Section 15: Carcinogenicity information information was added.
Section 15: Regulations - Inventories information was deleted.

Annex

1. Title	
Substance identification	3,3'-Oxybis(ethyleneoxy)bis(propylamine); EC No. 224-207-2; CAS Nbr 4246-51-9;
Exposure Scenario Name	Industrial Mixing and Application
Lifecycle Stage	Use at industrial sites
Contributing activities	PROC 04 -Chemical production where opportunity for exposure arises PROC 05 -Mixing or blending in batch processes PROC 13 -Treatment of articles by dipping and pouring ERC 06d -Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
Processes, tasks and activities covered	Charging material in open systems where significant opportunity for exposure arises e.g. charging from open drum. Mixing or blending of solid or liquid materials.
2. Operational conditions and risk management measures	
Operating Conditions	**Physical state:**Liquid. **General operating conditions:** Duration of use: 8 hours/day; Frequency of exposure at workplace [for one worker]: 5 days/week; Indoor use;
Risk management measures	Under the operational conditions described above the following risk management measures apply: **General risk management measures:** **Human health:** Goggles - Chemical resistant; Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Refer to Section 8 of the SDS for specific glove material.;

	Environmental: None needed;
Waste management measures	No use-specific waste management measures are required for this product. Refer to Section 13 of main SDS for disposal instructions:
3. Prediction of exposure	
Prediction of exposure	Human and environmental exposures are not expected to exceed the DNELs and PNECs when the identified risk management measures are adopted.

1. Title	
Substance identification	2,4,6-Tris(dimethylaminomethyl)phenol; EC No. 202-013-9; CAS Nbr 90-72-2;
Exposure Scenario Name	Industrial Mixing and Application
Lifecycle Stage	Use at industrial sites
Contributing activities	PROC 05 -Mixing or blending in batch processes PROC 08a -Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC 08b -Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC 09 -Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC 10 -Roller application or brushing PROC 13 -Treatment of articles by dipping and pouring PROC 15 -Use a laboratory reagent ERC 05 -Use at industrial site leading to inclusion into/onto article ERC 06d -Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
Processes, tasks and activities covered	Application of product with a roller or brush. Application of product with applicator gun. Mixing or blending of solid or liquid materials. Transfer of substances/mixtures into small containers e.g. tubes , bottles or small reservoirs. Transfers with dedicated controls, including loading, filling, dumping, bagging. Transfers without dedicated controls, including loading, filling, dumping, bagging. Use as a laboratory reagent.
2. Operational conditions and risk management measures	
Operating Conditions	**Physical state:**Liquid. **General operating conditions:** Emission days per year: 220 days/year; Indoors with good general ventilation; Processing Temperature:: <= 40 degree Celsius; **Task: Transferring Material**; Duration of use: 4 hours/day; **Task: Mixing**; Duration of use: 8 hours/day; **Task: Laboratory use**; Duration of use: <= 1 hour(s);
Risk management measures	Under the operational conditions described above the following risk management measures apply: **General risk management measures:** **Human health:** Face shield; Local exhaust ventilation; Protective clothing / Wear suitable protective clothing; **Environmental:** None needed; ;

	The following task-specific risk management measures apply in addition to those listed above: **Task: Laboratory use**; **Human Health**; Protective Gloves - Chemical resistant. Refer to Section 8 of the SDS for specific glove material.;
Waste management measures	Send to a municipal sewage treatment plant;
3. Prediction of exposure	
Prediction of exposure	Human and environmental exposures are not expected to exceed the DNELs and PNECs when the identified risk management measures are adopted.

DISCLAIMER: The information on this Safety Data Sheet is based on our experience and is correct to the best of our knowledge at the date of publication, but we do not accept any liability for any loss, damage or injury resulting from its use (except as required by law). The information may not be valid for any use not referred to in this Data Sheet or use of the product in combination with other materials. For these reasons, it is important that customers carry out their own test to satisfy themselves as to the suitability of the product for their own intended applications.

3M United Kingdom MSDSs are available at www.3M.com/uk

Safety Data Sheet

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Revision date:	22/08/2019	**Supersedes date:**	15/02/2019

Transportation version number: 1.00 (15/02/2019)

This Safety Data Sheet has been prepared in accordance with the REACH Regulation (EC) 1907/2006 and its modifications.

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

1.1. Product identifier
3M™ Thermally Conductive Epoxy Adhesive TC-2810 (Part B)

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

Identified uses
Conductive adhesive

1.3. Details of the supplier of the safety data sheet

Address:	3M United Kingdom PLC, 3M Centre, Cain Road, Bracknell, Berkshire, RG12 8HT.
Telephone:	+44 (0)1344 858 000
E Mail:	tox.uk@mmm.com
Website:	www.3M.com/uk

1.4. Emergency telephone number
+44 (0)1344 858 000

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture
CLP REGULATION (EC) No 1272/2008

CLASSIFICATION:
Serious Eye Damage/Eye Irritation, Category 2 - Eye Irrit. 2; H319
Skin Corrosion/Irritation, Category 2 - Skin Irrit. 2; H315
Skin Sensitization, Category 1 - Skin Sens. 1; H317
Hazardous to the Aquatic Environment (Chronic), Category 2 - Aquatic Chronic 2; H411

For full text of H phrases, see Section 16.

2.2. Label elements
CLP REGULATION (EC) No 1272/2008

SIGNAL WORD
WARNING.

Symbols:
GHS07 (Exclamation mark) |GHS09 (Environment) |

Pictograms

Ingredients:

Ingredient	CAS Nbr	EC No.	% by Wt
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	216-823-5	60 - 75

HAZARD STATEMENTS:

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

PRECAUTIONARY STATEMENTS

Prevention:

P280E	Wear protective gloves.
P273	Avoid release to the environment.

Response:

P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.

Disposal:

P501	Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

For containers not exceeding 125 ml the following Hazard and Precautionary statements may be used:

<=125 ml Hazard statements

H317	May cause an allergic skin reaction.

<=125 ml Precautionary statements

Prevention:

P280E	Wear protective gloves.

Response:

P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.

2.3. Other hazards

None known.

SECTION 3: Composition/information on ingredients

Ingredient	CAS Nbr	EC No.	REACH Registration No.	% by Wt	Classification
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	216-823-5	01-2119456619-26	60 - 75	Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317 Aquatic Chronic 2, H411
Boron Nitride (BN)	10043-11-5	233-136-6		20 - 30	Substance not classified as hazardous
MBS POLYMERS	Trade Secret			10 - 20	Substance not classified as hazardous

Please see section 16 for the full text of any H statements referred to in this section

For information on ingredient occupational exposure limits or PBT or vPvB status, see sections 8 and 12 of this SDS

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation
Remove person to fresh air. If you feel unwell, get medical attention.

Skin contact
Immediately wash with soap and water. Remove contaminated clothing and wash before reuse. If signs/symptoms develop, get medical attention.

Eye contact
Flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. If signs/symptoms persist, get medical attention.

If swallowed
Rinse mouth. If you feel unwell, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed
See Section 11.1 Information on toxicological effects

4.3. Indication of any immediate medical attention and special treatment required
Not applicable

SECTION 5: Fire-fighting measures

5.1. Extinguishing media
In case of fire: Use a fire fighting agent suitable for ordinary combustible material such as water or foam to extinguish.

5.2. Special hazards arising from the substance or mixture
None inherent in this product.

Hazardous Decomposition or By-Products

Substance	Condition
Aldehydes.	During combustion.

Carbon monoxide.	During combustion.
Carbon dioxide.	During combustion.
Hydrogen Chloride	During combustion.
Oxides of nitrogen.	During combustion.

5.3. Advice for fire-fighters
Wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapours, in accordance with good industrial hygiene practice. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions
Avoid release to the environment. For larger spills, cover drains and build dykes to prevent entry into sewer systems or bodies of water.

6.3. Methods and material for containment and cleaning up
Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Clean up residue with an appropriate solvent selected by a qualified and authorised person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and Safety Data Sheet. Seal the container. Dispose of collected material as soon as possible.

6.4. Reference to other sections
Refer to Section 8 and Section 13 for more information

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Avoid breathing of vapours created during the cure cycle. Avoid breathing dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Wash contaminated clothing before reuse. Avoid contact with oxidising agents (eg. chlorine, chromic acid etc.)

7.2. Conditions for safe storage including any incompatibilities
Store away from acids. Store away from oxidising agents.

7.3. Specific end use(s)
See information in Section 7.1 and 7.2 for handling and storage recommendations. See Section 8 for exposure controls and personal protection recommendations.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits
No occupational exposure limit values exist for any of the components listed in Section 3 of this Safety Data Sheet.

Biological limit values
No biological limit values exist for any of the components listed in Section 3 of this safety data sheet.

8.2. Exposure controls

8.2.1. Engineering controls
Provide ventilated enclosure for heat curing. Curing enclosures must be exhausted to outdoors or to a suitable emission control device. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapours/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:
Indirect vented goggles.

Applicable Norms/Standards
Use eye protection conforming to EN 166

Skin/hand protection
Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing. Note: Nitrile gloves may be worn over polymer laminate gloves to improve dexterity.
Gloves made from the following material(s) are recommended:

Material	Thickness (mm)	Breakthrough Time
Polymer laminate	No data available	No data available

Applicable Norms/Standards
Use gloves tested to EN 374

If this product is used in a manner that presents a higher potential for exposure (eg. spraying, high splash potential etc.), then use of protective coveralls may be necessary. Select and use body protection to prevent contact based on the results of an exposure assessment. The following protective clothing material(s) are recommended: Apron - polymer laminate

Respiratory protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:
Half facepiece or full facepiece air-purifying respirator suitable for organic vapours and particulates

For questions about suitability for a specific application, consult with your respirator manufacturer.

Applicable Norms/Standards
Use a respirator conforming to EN 140 or EN 136: filter types A & P

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	
Physical state	Liquid.
Colour	Milky Yellow
Specific Physical Form:	Paste
Odor	Epoxy
Odour threshold	*No data available.*
pH	*No data available.*
Boiling point/boiling range	> 170 ºC
Melting point	*Not applicable.*
Flammability (solid, gas)	Not applicable.
Explosive properties	Not classified
Oxidising properties	Not classified
Flash point	>=170 ºC [*Test Method:*Estimated]
Autoignition temperature	*No data available.*
Flammable Limits(LEL)	*No data available.*
Flammable Limits(UEL)	*No data available.*
Vapour pressure	<=2.7 Pa [@ 20 ºC]
Relative density	1.44 [*Ref Std:*WATER=1]
Water solubility	Negligible
Solubility- non-water	*No data available.*
Partition coefficient: n-octanol/water	*No data available.*
Evaporation rate	*Not applicable.*
Vapour density	Nil
Decomposition temperature	*No data available.*
Viscosity	150,000 mPa-s [@ 20 ºC]
Density	1.44 g/ml

9.2. Other information

EU Volatile Organic Compounds	*No data available.*
Percent volatile	0 % weight

SECTION 10: Stability and reactivity

10.1 Reactivity
This material may be reactive with certain agents under certain conditions - see the remaining headings in this section

10.2 Chemical stability
Stable.

10.3 Possibility of hazardous reactions
Hazardous polymerisation will not occur.

10.4 Conditions to avoid
Heat is generated during cure. Do not cure a mass larger than 50 grams in a confined space to prevent a premature exothermic reaction with production of intense heat and smoke.

10.5 Incompatible materials
Strong acids.
Strong oxidising agents.

10.6 Hazardous decomposition products

Substance	Condition
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

SECTION 11: Toxicological information

The information below may not agree with the EU material classification in Section 2 and/or the ingredient classifications in Section 3 if specific ingredient classifications are mandated by a competent authority. In addition, statements and data presented in Section 11 are based on UN GHS calculation rules and classifications derived from 3M assessments.

11.1 Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation
Respiratory tract irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Skin contact
Mild Skin Irritation: Signs/symptoms may include localised redness, swelling, itching, and dryness. Allergic skin reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

Eye contact
Moderate eye irritation: Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Ingestion
Gastrointestinal irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhoea.

Toxicological Data
If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Dermal		No data available; calculated ATE >5,000 mg/kg
Overall product	Ingestion		No data available; calculated ATE >5,000 mg/kg
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Dermal	Rat	LD50 > 1,600 mg/kg
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Ingestion	Rat	LD50 > 1,000 mg/kg
Boron Nitride (BN)	Dermal	Rabbit	LD50 > 20,000 mg/kg
Boron Nitride (BN)	Ingestion	Rat	LD50 > 50,000 mg/kg
MBS POLYMERS	Dermal	Rabbit	LD50 > 5,000 mg/kg
MBS POLYMERS	Ingestion	Rat	LD50 > 5,000 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Rabbit	Mild irritant
MBS POLYMERS	Professional judgement	Minimal irritation

Serious Eye Damage/Irritation

Name	Species	Value
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Rabbit	Moderate irritant
MBS POLYMERS	Professional judgement	Mild irritant

Skin Sensitisation

Name	Species	Value
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Human and animal	Sensitising

Respiratory Sensitisation

Name	Species	Value
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Human	Not classified

Germ Cell Mutagenicity

Name	Route	Value
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	In vivo	Not mutagenic
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	In Vitro	Some positive data exist, but the data are not sufficient for classification

Carcinogenicity

Name	Route	Species	Value
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Dermal	Mouse	Some positive data exist, but the data are not sufficient for classification

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test result	Exposure Duration
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Ingestion	Not classified for female reproduction	Rat	NOAEL 750 mg/kg/day	2 generation
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Ingestion	Not classified for male reproduction	Rat	NOAEL 750 mg/kg/day	2 generation
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Dermal	Not classified for development	Rabbit	NOAEL 300 mg/kg/day	during organogenesis
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Ingestion	Not classified for development	Rat	NOAEL 750 mg/kg/day	2 generation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

For the component/components, either no data is currently available or the data is not sufficient for classification.

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Dermal	liver	Not classified	Rat	NOAEL 1,000 mg/kg/day	2 years
2,2'-[(1-Methylethylidene)bis(4,1-	Dermal	nervous system	Not classified	Rat	NOAEL 1,000	13 weeks

phenyleneoxymethylene)]bisoxirane					mg/kg/day	
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Ingestion	auditory system | heart | endocrine system | hematopoietic system | liver | eyes | kidney and/or bladder	Not classified	Rat	NOAEL 1,000 mg/kg/day	28 days

Aspiration Hazard
For the component/components, either no data is currently available or the data is not sufficient for classification.

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

The information below may not agree with the EU material classification in Section 2 and/or the ingredient classifications in Section 3 if specific ingredient classifications are mandated by a competent authority. In addition, statements and data presented in Section 12 are based on UN GHS calculation rules and classifications derived from 3M assessments.

12.1. Toxicity

No product test data available.

Material	CAS #	Organism	Type	Exposure	Test endpoint	Test result
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Rainbow trout	Estimated	96 hours	LC50	2 mg/l
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Water flea	Estimated	48 hours	EC50	1.8 mg/l
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Green Algae	Experimental	72 hours	EC50	>11 mg/l
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Green Algae	Experimental	72 hours	NOEC	4.2 mg/l
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Water flea	Experimental	21 days	NOEC	0.3 mg/l
Boron Nitride (BN)	10043-11-5	Rainbow trout	Experimental		LC50	>100 mg/l
Boron Nitride (BN)	10043-11-5	Water flea	Experimental		EC50	>100 mg/l
MBS POLYMERS	Trade Secret		Data not available or insufficient for classification			

12.2. Persistence and degradability

Material	CAS Nbr	Test type	Duration	Study Type	Test result	Protocol
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Experimental Hydrolysis		Hydrolytic half-life	117 hours (t 1/2)	Other methods
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Experimental Biodegradation	28 days	BOD	5 %BOD/COD	OECD 301F - Manometric respirometry
Boron Nitride (BN)	10043-11-5	Data not availbl-insufficient			N/A	
MBS POLYMERS	Trade Secret	Data not availbl-insufficient			N/A	

12.3 : Bioaccumulative potential

Material	Cas No.	Test type	Duration	Study Type	Test result	Protocol
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Experimental Bioconcentration		Log Kow	3.242	Other methods
Boron Nitride (BN)	10043-11-5	Data not available or insufficient for classification	N/A	N/A	N/A	N/A
MBS POLYMERS	Trade Secret	Data not available or insufficient for classification	N/A	N/A	N/A	N/A

12.4. Mobility in soil
Please contact manufacturer for more details

12.5. Results of the PBT and vPvB assessment

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

12.6. Other adverse effects
No information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of completely cured (or polymerized) material in a permitted industrial waste facility. Proper destruction may require the use of additional fuel during incineration processes. Combustion products will include halogen acid (HCl/HF/HBr). Facility must be capable of handling halogenated materials. As a disposal alternative, utilize an acceptable permitted waste disposal facility. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

The coding of a waste stream is based on the application of the product by the consumer. Since this is out of the control of 3M, no waste code(s) for products after use will be provided. Please refer to the European Waste Code (EWC - 2000/532/EC and amendments) to assign the correct waste code to your waste stream. Ensure national and/or regional regulations are complied with and always use a licensed waste contractor.

EU waste code (product as sold)
08 04 09* Waste adhesives and sealants containing organic solvents or other dangerous substances

SECTION 14: Transportation information

ADR: UN3082; Environmentally Hazardous Substance, Liquid, N.O.S (4,4-Isopropylidenediphenol-Epichlorohydrin Polymer) 9; III; (-); M6.
IATA: UN3082; Environmentally Hazardous Substance, Liquid, N.O.S (4,4-Isopropylidenediphenol-Epichlorohydrin Polymer) 9; III.
IMDG: UN3082; Environmentally Hazardous Substance, Liquid, N.O.S (4,4-Isopropylidenediphenol-Epichlorohydrin Polymer) 9; III; EMS-Code: FA, SF.
Exemption: For vessels containing a net quantity of 5 l or a net mass of 5 kg or less per single or inner packaging , special provision 375 (ADR), exemption per 2.10.2.7 (IMDG) or special provision A197 (IATA) may be applied, if applicable

SECTION 15: Regulatory information

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

Carcinogenicity

Ingredient	CAS Nbr	Classification	Regulation
2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	Gr. 3: Not classifiable	International Agency for Research on Cancer

15.2. Chemical Safety Assessment
A chemical safety assessment has not been carried out for this mixture. Chemical safety assessments for the contained substances may have been carried out by the registrants of the substances in accordance with Regulation (EC) No 1907/2006, as amended.

SECTION 16: Other information

List of relevant H statements

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

Revision information:
CLP: Ingredient table information was modified.
Section 3: Composition/ Information of ingredients table information was modified.
Section 09: Color information was added.
Section 09: Odor information was added.
Sections 3 and 9: Odour, colour, grade information information was deleted.
Section 11: Acute Toxicity table information was modified.
Section 11: Carcinogenicity Table information was modified.
Section 11: Germ Cell Mutagenicity Table information was modified.
Section 11: Reproductive Toxicity Table information was modified.
Section 11: Respiratory Sensitization Table information was modified.
Section 11: Serious Eye Damage/Irritation Table information was modified.
Section 11: Skin Corrosion/Irritation Table information was modified.
Section 11: Skin Sensitization Table information was modified.
Section 11: Target Organs - Repeated Table information was modified.
Section 12: Component ecotoxicity information information was modified.
Section 12: Persistence and Degradability information information was modified.

Section 12:Bioccumulative potential information information was modified.
Section 15: Carcinogenicity information information was added.
Section 15: Regulations - Inventories information was deleted.

DISCLAIMER: The information on this Safety Data Sheet is based on our experience and is correct to the best of our knowledge at the date of publication, but we do not accept any liability for any loss, damage or injury resulting from its use (except as required by law). The information may not be valid for any use not referred to in this Data Sheet or use of the product in combination with other materials. For these reasons, it is important that customers carry out their own test to satisfy themselves as to the suitability of the product for their own intended applications.

3M United Kingdom MSDSs are available at www.3M.com/uk