Safety Data Sheet

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This Safety Data Sheet has been prepared in accordance with the Malaysia Occupational Safety and Health (Chemical Classification, Labelling and Safety Data Sheets) Regulations 2013.

SECTION 1: Identification

1.1. Product identifier
3M™ Scotch-Weld™ Epoxy Adhesive 2290, Amber

Product Identification Numbers
62-3847-7530-0 62-3847-7535-9 62-3847-8531-7 62-3847-9530-8

1.2. Recommended use and restrictions on use

Recommended use
Industrial use

1.3. Supplier's details
ADDRESS: 3M Malaysia Sdn. Bhd., Level 8, Block F, Oasis Square, No.2, Jalan PJU 1A/7A, Ara Damansara 47301 Petaling, Jaya, Selangor
Telephone: 03-7884 2888
E Mail: 3mmyehsr@mmm.com
Website: www.3M.com.my

1.4. Emergency telephone number
+60 03-7884 2888

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture
Flammable Liquid: Category 2.
Serious Eye Damage/Irritation: Category 1.
Skin Sensitizer: Category 1.
Germ Cell Mutagenicity: Category 2.
Carcinogenicity: Category 2.
Reproductive Toxicity: Category 1B.
Chronic Aquatic Toxicity: Category 3.

2.2. Label elements
Signal word
Danger

Symbols
Flame |Corrosion |Exclamation mark |Health Hazard |

Pictograms



Hazard Statements:

H225	Highly flammable liquid and vapor.
H318	Causes serious eye damage.
H317	May cause an allergic skin reaction.
H341	Suspected of causing genetic defects.
H351	Suspected of causing cancer.
H360	May damage fertility or the unborn child.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention:

P201	Obtain special instructions before use.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280B	Wear protective gloves, eye protection, and face protection.
P281	Use personal protective equipment as required.

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.
P310	Immediately call a POISON CENTER or doctor.
P333 + P313	If skin irritation or rash occurs: Get medical attention.
P370 + P378	In case of fire: Use a fire fighting agent suitable for flammable liquids such as dry chemical or carbon dioxide to extinguish.

Disposal:

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

2.3. Other hazards
May cause drowsiness or dizziness.

SECTION 3: Composition/information on ingredients

This material is a mixture.

Ingredient	C.A.S. No.	% by Wt
methyl ethyl ketone	78-93-3	55 - 65
tetrahydrofuran	109-99-9	10 - < 20
epoxy resin	25068-38-6	10 - < 15
phenoxy resin	5026-74-4	3 - 7

1-methyl-2-pyrrolidinone	872-50-4	1 - 5
toluene	108-88-3	<= 0.4

Any remaining components do not contribute to the hazards of this material.

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:
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. If you feel unwell, get medical attention.

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

Allergic skin reaction (redness, swelling, blistering, and itching). Serious damage to the eyes (corneal cloudiness, severe pain, tearing, ulcerations, and significantly impaired or loss of vision). Central nervous system depression (headache, dizziness, drowsiness, incoordination, nausea, slurred speech, giddiness, and unconsciousness). Target organ effects following prolonged or repeated exposure. See Section 11 for additional details.

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

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media
In case of fire: Use a fire fighting agent suitable for flammable liquids such as dry chemical or carbon dioxide to extinguish.

5.2. Special hazards arising from the substance or mixture
Closed containers exposed to heat from fire may build pressure and explode.

Hazardous Decomposition or By-Products

Substance	Condition
Aldehydes	During Combustion
Hydrocarbons	During Combustion
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Hydrogen Chloride	During Combustion
Hydrogen Cyanide	During Combustion
Ketones	During Combustion
Ammonia	During Combustion
Oxides of Nitrogen	During Combustion

5.3. Special protective actions for fire-fighters
Water may not effectively extinguish fire; however, it should be used to keep fire-exposed containers and surfaces cool and prevent explosive rupture. 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. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use only non-sparking tools. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Warning! A motor could be an ignition source and could cause flammable gases or vapors in the spill area to burn or explode. Use personal protective equipment based on the results of an exposure assessment. Refer to Section 8 for PPE recommendations. If anticipated exposure resulting from an accidental release exceeds the protective capabilities of the PPE listed in Section 8, or are unknown, select PPE that offers an appropriate level of protection. Consider the physical and chemical hazards of the material when doing so. Examples of PPE ensembles for emergency response could include wearing bunker gear for a release of flammable material; wearing chemical protective clothing if the spilled material is a corrosive, a sensitizer, a significant dermal irritant, or can be absorbed through the skin; or donning a positive pressure supplied-air respirator for chemicals with inhalation hazards. For information regarding physical and health hazards, refer to sections 2 and 11 of the SDS.

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

6.3. Methods and material for containment and cleaning up
Contain spill. Cover spill area with a fire-extinguishing foam. 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 using non-sparking tools. Place in a metal container approved for transportation by appropriate authorities. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and SDS. Seal the container. Dispose of collected material as soon as possible in accordance with applicable local/regional/national/international regulations.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
For industrial/occupational use only. Not for consumer sale or use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe dust/fume/gas/mist/vapors/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. Wash contaminated clothing before reuse. Avoid contact with oxidizing agents (eg. chlorine, chromic acid etc.) Wear low static or properly grounded shoes. Use personal protective equipment (gloves, respirators, etc.) as required. To minimize the risk of ignition, determine applicable electrical classifications for the process using this product and select specific local exhaust ventilation equipment to avoid flammable vapor accumulation. Ground/bond container and receiving equipment if there is potential for static electricity accumulation during transfer.

7.2. Conditions for safe storage including any incompatibilities
Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store away from heat. Store away from acids. Store away from oxidizing agents.

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	C.A.S. No.	Agency	Limit type	Additional Comments
toluene	108-88-3	ACGIH	TWA:20 ppm	A4: Not class. as human carcin,Ototoxicant
toluene	108-88-3	Malaysia OELs	TWA(8 hours):188 mg/m3(50 ppm)	SKIN
tetrahydrofuran	109-99-9	ACGIH	TWA:50 ppm;STEL:100 ppm	A3: Confirmed animal carcin.,Danger of cutaneous absorption
tetrahydrofuran	109-99-9	Malaysia OELs	TWA(8 hours):590 mg/m3(200 ppm)	
methyl ethyl ketone	78-93-3	ACGIH	TWA:75 ppm;STEL:150 ppm	Danger of cutaneous absorption
methyl ethyl ketone	78-93-3	Malaysia OELs	TWA(8 hours):590 mg/m3(200 ppm)	

ACGIH : American Conference of Governmental Industrial Hygienists
CMRG : Chemical Manufacturer's Recommended Guidelines
Malaysia OELs : Malaysia. Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations
TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls
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/vapors/spray. If ventilation is not adequate, use respiratory protection equipment. Use explosion-proof ventilation 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

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: Polymer laminate

If this product is used in a manner that presents a higher potential for exposure (e.g., spraying, high splash potential, etc.), then use of a protective apron may be necessary. See recommended glove material(s) for determining appropriate apron material(s). If a glove material is not available as an apron, polymer laminate is a suitable option.

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 vapors
Half facepiece or full facepiece supplied-air respirator

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

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Liquid
Color	Clear Yellow
Odor	Moderate Ketones
Odor threshold	*No Data Available*
pH	*No Data Available*
Melting point/Freezing point	*No Data Available*
Boiling point/Initial boiling point/Boiling range	66.1 ºC [*Details:*CONDITIONS: THF]
Flash Point	-14.4 ºC [*Test Method:*Tagliabue Closed Cup]
Evaporation rate	>=2 [*Ref Std:*ETHER=1]
Flammability	Flammable Liquid: Category 2.
Flammable Limits(LEL)	2 % volume
Flammable Limits(UEL)	11.8 % volume
Vapor Pressure	19,331.7 Pa [*Details:*CONDITIONS: @ 68F]
Relative Vapor Density	2.5 [*Ref Std:*AIR=1]
Density	0.89 g/ml
Relative Density	0.89 [*Ref Std:*WATER=1]
Water solubility	Slight (less than 10%)
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	*No Data Available*
Decomposition temperature	*No Data Available*
Kinematic Viscosity	75.8 mm2/sec
Volatile Organic Compounds	*No Data Available*
Percent volatile	*No Data Available*
VOC Less H2O & Exempt Solvents	701 g/l [*Test Method:*calculated SCAQMD rule 443.1]
VOC Less H2O & Exempt Solvents	78.8 % [*Test Method:*calculated per CARB title 2]
Molecular weight	*No Data Available*

Particle Characteristics	*Not Applicable*

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 polymerization will not occur.

10.4. Conditions to avoid
Heat
Sparks and/or flames

10.5. Incompatible materials
Strong oxidizing 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 be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

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.

May cause additional health effects (see below).

Skin Contact:
Mild Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, and dryness. Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

May cause additional health effects (see below).

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:
May be harmful if swallowed.
Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

May cause additional health effects (see below).

Additional Health Effects:

Single exposure may cause target organ effects:
Central Nervous System (CNS) Depression: Signs/symptoms may include headache, dizziness, drowsiness, incoordination, nausea, slowed reaction time, slurred speech, giddiness, and unconsciousness.

Prolonged or repeated exposure may cause target organ effects:
Gastrointestinal Effects: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

Reproductive/Developmental Toxicity:
Contains a chemical or chemicals which can cause birth defects or other reproductive harm.

Genotoxicity:
Genotoxicity and Mutagenicity: May interact with genetic material and possibly alter gene expression.

Carcinogenicity:
Contains a chemical or chemicals which can cause cancer.

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	Inhalation-Vapor(4 hr)		No data available; calculated ATE >50 mg/l
Overall product	Ingestion		No data available; calculated ATE >2,000 - =5,000 mg/kg
methyl ethyl ketone	Dermal	Rabbit	LD50 > 8,050 mg/kg
methyl ethyl ketone	Inhalation-Vapor (4 hours)	Rat	LC50 34.5 mg/l
methyl ethyl ketone	Ingestion	Rat	LD50 2,737 mg/kg
tetrahydrofuran	Dermal	Rat	LD50 > 2,000 mg/kg
tetrahydrofuran	Inhalation-Vapor (4 hours)	Rat	LC50 54 mg/l
tetrahydrofuran	Ingestion	Rat	LD50 1,650 mg/kg
epoxy resin	Dermal	Rat	LD50 > 1,600 mg/kg
epoxy resin	Ingestion	Rat	LD50 > 1,000 mg/kg
phenoxy resin	Dermal	Rat	LD50 > 4,000 mg/kg
phenoxy resin	Ingestion	Rat	LD50 1,037 mg/kg
1-methyl-2-pyrrolidinone	Dermal	Rabbit	LD50 4,000 mg/kg
1-methyl-2-pyrrolidinone	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 5.1 mg/l
1-methyl-2-pyrrolidinone	Ingestion	Rat	LD50 4,320 mg/kg
toluene	Dermal	Rat	LD50 12,000 mg/kg
toluene	Inhalation-Vapor (4 hours)	Rat	LC50 30 mg/l
toluene	Ingestion	Rat	LD50 5,550 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
methyl ethyl ketone	Rabbit	Minimal irritation
tetrahydrofuran	Rabbit	Minimal irritation
epoxy resin	Rabbit	Mild irritant
phenoxy resin	Rabbit	No significant irritation
1-methyl-2-pyrrolidinone	Rabbit	Minimal irritation
toluene	Rabbit	Irritant

Serious Eye Damage/Irritation

Name	Species	Value
methyl ethyl ketone	Rabbit	Severe irritant
tetrahydrofuran	Rabbit	Corrosive

epoxy resin	Rabbit	Moderate irritant
phenoxy resin	Rabbit	Mild irritant
1-methyl-2-pyrrolidinone	Rabbit	Severe irritant
toluene	Rabbit	Moderate irritant

Sensitization:

Skin Sensitization

Name	Species	Value
tetrahydrofuran	Human and animal	Not classified
epoxy resin	Human and animal	Sensitizing
phenoxy resin	Mouse	Sensitizing
1-methyl-2-pyrrolidinone	Human and animal	Not classified
toluene	Guinea pig	Not classified

Respiratory Sensitization

Name	Species	Value
epoxy resin	Human	Not classified

Germ Cell Mutagenicity

Name	Route	Value
methyl ethyl ketone	In Vitro	Not mutagenic
tetrahydrofuran	In Vitro	Not mutagenic
tetrahydrofuran	In vivo	Not mutagenic
epoxy resin	In vivo	Not mutagenic
epoxy resin	In Vitro	Some positive data exist, but the data are not sufficient for classification
phenoxy resin	In Vitro	Some positive data exist, but the data are not sufficient for classification
phenoxy resin	In vivo	Mutagenic
1-methyl-2-pyrrolidinone	In vivo	Not mutagenic
1-methyl-2-pyrrolidinone	In Vitro	Some positive data exist, but the data are not sufficient for classification
toluene	In Vitro	Not mutagenic
toluene	In vivo	Not mutagenic

Carcinogenicity

Name	Route	Species	Value
methyl ethyl ketone	Inhalation	Human	Not carcinogenic
tetrahydrofuran	Inhalation	Multiple animal species	Carcinogenic
epoxy resin	Dermal	Mouse	Some positive data exist, but the data are not sufficient for classification
1-methyl-2-pyrrolidinone	Inhalation	Rat	Not carcinogenic
toluene	Dermal	Mouse	Some positive data exist, but the data are not sufficient for classification
toluene	Ingestion	Rat	Some positive data exist, but the data are not sufficient for classification
toluene	Inhalation	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
methyl ethyl ketone	Inhalation	Not classified for development	Rat	LOAEL 8.8 mg/l	during gestation
tetrahydrofuran	Ingestion	Not classified for female reproduction	Rat	NOAEL 782 mg/kg/day	2 generation
tetrahydrofuran	Ingestion	Not classified for male reproduction	Rat	NOAEL 782 mg/kg/day	2 generation
tetrahydrofuran	Ingestion	Not classified for development	Rat	NOAEL 305 mg/kg/day	2 generation
tetrahydrofuran	Inhalation	Not classified for development	Mouse	NOAEL 1.8 mg/l	during gestation
epoxy resin	Ingestion	Not classified for female reproduction	Rat	NOAEL 750 mg/kg/day	2 generation
epoxy resin	Ingestion	Not classified for male reproduction	Rat	NOAEL 750 mg/kg/day	2 generation
epoxy resin	Dermal	Not classified for development	Rabbit	NOAEL 300 mg/kg/day	during organogenesis
epoxy resin	Ingestion	Not classified for development	Rat	NOAEL 750 mg/kg/day	2 generation
phenoxy resin	Ingestion	Not classified for male reproduction	Rat	NOAEL 25 mg/kg/day	2 generation
phenoxy resin	Ingestion	Not classified for development	Rat	NOAEL 15 mg/kg/day	during gestation
phenoxy resin	Ingestion	Toxic to female reproduction	Rat	NOAEL 50 mg/kg/day	28 days
1-methyl-2-pyrrolidinone	Inhalation	Not classified for development	Rat	LOAEL 0.68 mg/l	during gestation
1-methyl-2-pyrrolidinone	Ingestion	Toxic to female reproduction	Rat	LOAEL 50 mg/kg/day	2 generation
1-methyl-2-pyrrolidinone	Ingestion	Toxic to male reproduction	Rat	LOAEL 50 mg/kg/day	2 generation
1-methyl-2-pyrrolidinone	Dermal	Toxic to development	Rat	NOAEL 237 mg/kg/day	during organogenesis
1-methyl-2-pyrrolidinone	Ingestion	Toxic to development	Rat	NOAEL 160 mg/kg/day	2 generation
toluene	Inhalation	Not classified for female reproduction	Human	NOAEL Not available	occupational exposure
toluene	Inhalation	Not classified for male reproduction	Rat	NOAEL 2.3 mg/l	1 generation
toluene	Ingestion	Toxic to development	Rat	LOAEL 520 mg/kg/day	during gestation
toluene	Inhalation	Toxic to development	Human	NOAEL Not available	poisoning and/or abuse

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
methyl ethyl ketone	Inhalation	central nervous system depression	May cause drowsiness or dizziness	official classification	NOAEL Not available	
methyl ethyl ketone	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	
methyl ethyl ketone	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Not available	
methyl ethyl ketone	Ingestion	liver	Not classified	Rat	NOAEL Not available	not applicable
methyl ethyl ketone	Ingestion	kidney and/or bladder	Not classified	Rat	LOAEL 1,080 mg/kg	not applicable

tetrahydrofuran	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
tetrahydrofuran	Inhalation	respiratory irritation	May cause respiratory irritation		NOAEL Not available	
tetrahydrofuran	Inhalation	respiratory system	Not classified	Rabbit	NOAEL 2.9 mg/l	4 hours
tetrahydrofuran	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Rat	NOAEL 180 mg/kg	not applicable
1-methyl-2-pyrrolidinone	Inhalation	respiratory irritation	Not classified	Human	NOAEL 0.05 mg/l	8 hours
toluene	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
toluene	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	
toluene	Inhalation	immune system	Not classified	Mouse	NOAEL 0.004 mg/l	3 hours
toluene	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	poisoning and/or abuse

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
methyl ethyl ketone	Dermal	nervous system	Not classified	Guinea pig	NOAEL Not available	31 weeks
methyl ethyl ketone	Inhalation	liver | kidney and/or bladder | heart | endocrine system | gastrointestinal tract | bone, teeth, nails, and/or hair | hematopoietic system | immune system | muscles	Not classified	Rat	NOAEL 14.7 mg/l	90 days
methyl ethyl ketone	Ingestion	liver	Not classified	Rat	NOAEL Not available	7 days
methyl ethyl ketone	Ingestion	nervous system	Not classified	Rat	NOAEL 173 mg/kg/day	90 days
tetrahydrofuran	Inhalation	liver	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 0.6 mg/l	12 weeks
tetrahydrofuran	Inhalation	respiratory system	Not classified	Rat	NOAEL 2.9 mg/l	12 weeks
tetrahydrofuran	Inhalation	kidney and/or bladder	Not classified	Rat	NOAEL 0.6 mg/l	105 weeks
tetrahydrofuran	Ingestion	liver	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL Not available	2 weeks
epoxy resin	Dermal	liver	Not classified	Rat	NOAEL 1,000 mg/kg/day	2 years
epoxy resin	Dermal	nervous system	Not classified	Rat	NOAEL 1,000 mg/kg/day	13 weeks
epoxy resin	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
phenoxy resin	Ingestion	gastrointestinal tract	May cause damage to organs though prolonged or repeated exposure	Rat	NOAEL 15 mg/kg/day	90 days
phenoxy resin	Ingestion	endocrine system | bone, teeth, nails, and/or hair |	Not classified	Rat	NOAEL 450 mg/kg/day	28 days

		hematopoietic system | liver | immune system | kidney and/or bladder | nervous system				
phenoxy resin	Ingestion	eyes	Not classified	Rat	NOAEL 15 mg/kg/day	90 days
1-methyl-2-pyrrolidinone	Inhalation	bone marrow | immune system | respiratory system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 0.5 mg/l	4 weeks
1-methyl-2-pyrrolidinone	Ingestion	endocrine system	Not classified	Rat	NOAEL 250 mg/kg/day	90 days
1-methyl-2-pyrrolidinone	Ingestion	kidney and/or bladder	Not classified	Rat	NOAEL 2,060 mg/kg/day	4 weeks
1-methyl-2-pyrrolidinone	Ingestion	nervous system	Not classified	Rat	NOAEL 1,057 mg/kg/day	90 days
1-methyl-2-pyrrolidinone	Ingestion	hematopoietic system	Not classified	Mouse	NOAEL 300 mg/kg/day	90 days
1-methyl-2-pyrrolidinone	Ingestion	liver	Not classified	Mouse	NOAEL 150 mg/kg/day	3 months
toluene	Inhalation	auditory system | nervous system | eyes | olfactory system	Causes damage to organs through prolonged or repeated exposure	Human	NOAEL Not available	poisoning and/or abuse
toluene	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Rat	LOAEL 2.3 mg/l	15 months
toluene	Inhalation	heart | liver | kidney and/or bladder	Not classified	Rat	NOAEL 11.3 mg/l	15 weeks
toluene	Inhalation	endocrine system	Not classified	Rat	NOAEL 1.1 mg/l	4 weeks
toluene	Inhalation	immune system	Not classified	Mouse	NOAEL Not available	20 days
toluene	Inhalation	bone, teeth, nails, and/or hair	Not classified	Mouse	NOAEL 1.1 mg/l	8 weeks
toluene	Inhalation	hematopoietic system | vascular system	Not classified	Human	NOAEL Not available	occupational exposure
toluene	Inhalation	gastrointestinal tract	Not classified	Multiple animal species	NOAEL 11.3 mg/l	15 weeks
toluene	Ingestion	nervous system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 625 mg/kg/day	13 weeks
toluene	Ingestion	heart	Not classified	Rat	NOAEL 2,500 mg/kg/day	13 weeks
toluene	Ingestion	liver | kidney and/or bladder	Not classified	Multiple animal species	NOAEL 2,500 mg/kg/day	13 weeks
toluene	Ingestion	hematopoietic system	Not classified	Mouse	NOAEL 600 mg/kg/day	14 days
toluene	Ingestion	endocrine system	Not classified	Mouse	NOAEL 105 mg/kg/day	28 days
toluene	Ingestion	immune system	Not classified	Mouse	NOAEL 105 mg/kg/day	4 weeks

Aspiration Hazard

Name	Value
toluene	Aspiration hazard

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 be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. Additional information leading to material classification in Section 2 is available upon request. In addition, environmental fate and effects data on ingredients may not be reflected in this section because an ingredient is present below the threshold for labeling, an ingredient is not expected to be available for exposure, or the data is considered not relevant to the material as a whole.

12.1. Toxicity

Acute aquatic hazard:
GHS Acute 3: Harmful to aquatic life.

Chronic aquatic hazard:
GHS Chronic 3: Harmful to aquatic life with long lasting effects

No product test data available

Material	Cas #	Organism	Type	Exposure	Test Endpoint	Test Result
methyl ethyl ketone	78-93-3	Fathead Minnow	Experimental	96 hours	LC50	2,993 mg/l
methyl ethyl ketone	78-93-3	Green algae	Experimental	96 hours	ErC50	2,029 mg/l
methyl ethyl ketone	78-93-3	Water flea	Experimental	48 hours	EC50	308 mg/l
methyl ethyl ketone	78-93-3	Green algae	Experimental	96 hours	ErC10	1,289 mg/l
methyl ethyl ketone	78-93-3	Water flea	Experimental	21 days	NOEC	100 mg/l
methyl ethyl ketone	78-93-3	Bacteria	Experimental	16 hours	LOEC	1,150 mg/l
tetrahydrofuran	109-99-9	Activated sludge	Experimental	3 hours	IC50	460 mg/l
tetrahydrofuran	109-99-9	Fathead Minnow	Experimental	96 hours	LC50	2,160 mg/l
tetrahydrofuran	109-99-9	Water flea	Experimental	48 hours	LC50	3,485 mg/l
tetrahydrofuran	109-99-9	Fathead Minnow	Experimental	33 days	NOEC	216 mg/l
epoxy resin	25068-38-6	Rainbow Trout	Estimated	96 hours	LC50	2 mg/l
epoxy resin	25068-38-6	Water flea	Estimated	48 hours	LC50	1.8 mg/l
epoxy resin	25068-38-6	Activated sludge	Experimental	3 hours	IC50	>100 mg/l
epoxy resin	25068-38-6	Green algae	Experimental	72 hours	EC50	>11 mg/l
epoxy resin	25068-38-6	Green algae	Experimental	72 hours	NOEC	4.2 mg/l
epoxy resin	25068-38-6	Water flea	Experimental	21 days	NOEC	0.3 mg/l
phenoxy resin	5026-74-4	Water flea	Analogous Compound	48 hours	EC50	18 mg/l
phenoxy resin	5026-74-4	Bacteria	Experimental	16 hours	EC50	>=10 mg/l
phenoxy resin	5026-74-4	Common Carp	Experimental	96 hours	LC50	4.2 mg/l
phenoxy resin	5026-74-4	Green algae	Experimental	96 hours	ErC50	13 mg/l
phenoxy resin	5026-74-4	Green algae	Experimental	96 hours	NOEC	4.2 mg/l
phenoxy resin	5026-74-4	Water flea	Experimental	21 days	NOEC	0.42 mg/l
1-methyl-2-pyrrolidinone	872-50-4	Grass Shrimp	Experimental	96 hours	EC50	1,107 mg/l
1-methyl-2-pyrrolidinone	872-50-4	Green algae	Experimental	72 hours	EC50	600.5 mg/l
1-methyl-2-pyrrolidinone	872-50-4	Rainbow Trout	Experimental	96 hours	LC50	>500 mg/l
1-methyl-2-pyrrolidinone	872-50-4	Water flea	Experimental	48 hours	EC50	4,897 mg/l
1-methyl-2-pyrrolidinone	872-50-4	Green algae	Experimental	72 hours	EC10	92.6 mg/l
1-methyl-2-pyrrolidinone	872-50-4	Water flea	Experimental	21 days	NOEC	12.5 mg/l
toluene	108-88-3	Coho Salmon	Experimental	96 hours	LC50	5.5 mg/l
toluene	108-88-3	Grass Shrimp	Experimental	96 hours	LC50	9.5 mg/l
toluene	108-88-3	Green algae	Experimental	72 hours	EC50	12.5 mg/l
toluene	108-88-3	Leopard frog	Experimental	9 days	LC50	0.39 mg/l
toluene	108-88-3	Pink Salmon	Experimental	96 hours	LC50	6.41 mg/l
toluene	108-88-3	Water flea	Experimental	48 hours	EC50	3.78 mg/l

toluene	108-88-3	Coho Salmon	Experimental	40 days	NOEC	1.39 mg/l
toluene	108-88-3	Diatom	Experimental	72 hours	NOEC	10 mg/l
toluene	108-88-3	Water flea	Experimental	7 days	NOEC	0.74 mg/l
toluene	108-88-3	Activated sludge	Experimental	12 hours	IC50	292 mg/l
toluene	108-88-3	Bacteria	Experimental	16 hours	NOEC	29 mg/l
toluene	108-88-3	Bacteria	Experimental	24 hours	EC50	84 mg/l
toluene	108-88-3	Redworm	Experimental	28 days	LC50	>150 mg per kg of bodyweight
toluene	108-88-3	Soil microbes	Experimental	28 days	NOEC	<26 mg/kg (Dry Weight)

12.2. Persistence and degradability

Material	CAS No.	Test Type	Duration	Study Type	Test Result	Protocol
methyl ethyl ketone	78-93-3	Experimental Biodegradation	28 days	Biological Oxygen Demand	98 %BOD/ThOD	OECD 301D - Closed Bottle Test
tetrahydrofuran	109-99-9	Experimental Biodegradation	28 days	Biological Oxygen Demand	39 %BOD/ThOD	
epoxy resin	25068-38-6	Experimental Biodegradation	28 days	Biological Oxygen Demand	5 %BOD/COD	OECD 301F - Manometric Respiro
epoxy resin	25068-38-6	Experimental Hydrolysis		Hydrolytic half-life	117 hours (t 1/2)	
phenoxy resin	5026-74-4	Experimental Biodegradation	29 days	Carbon dioxide evolution	≤10 %CO2 evolution/THCO2 evolution	OECD 301B - Mod. Sturm or CO2
phenoxy resin	5026-74-4	Experimental Hydrolysis		Hydrolytic half-life (pH 7)	4.1 days (t 1/2)	OECD 111 Hydrolysis func of pH
1-methyl-2-pyrrolidinone	872-50-4	Experimental Biodegradation	28 days	Biological Oxygen Demand	73 %BOD/ThOD	OECD 301C - MITI (I)
toluene	108-88-3	Experimental Biodegradation	20 days	Biological Oxygen Demand	80 %BOD/ThOD	APHA Std Meth Water/Wastewater
toluene	108-88-3	Experimental Photolysis		Photolytic half-life (in air)	5.2 days (t 1/2)	

12.3. Bioaccumulative potential

Material	CAS No.	Test Type	Duration	Study Type	Test Result	Protocol
methyl ethyl ketone	78-93-3	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	0.3	OECD 117 log Kow HPLC method
tetrahydrofuran	109-99-9	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	0.45	
epoxy resin	25068-38-6	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	3.242	
phenoxy resin	5026-74-4	Modeled Bioconcentration		Log of Octanol/H2O part. coeff	0.87	Episuite™
1-methyl-2-pyrrolidinone	872-50-4	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	-0.46	
toluene	108-88-3	Experimental BCF - Other	72 hours	Bioaccumulation Factor	90	
toluene	108-88-3	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	2.73	

12.4. Mobility in soil

Please contact manufacturer for more details

12.5 Other adverse effects

No information available

SECTION 13: Disposal considerations

13.1. Disposal methods

According to the Environmental Quality (Scheduled Wastes) Regulations 2005, scheduled waste has to be sent to a prescribed premise for recycling, treatment or disposal. Please approach Kualiti Alam for proper schedule waste classification and disposal.

SECTION 14: Transport Information

Marine Transport (IMDG)

UN Number:UN1133
Proper Shipping Name:ADHESIVES CONTAINING FLAMMABLE LIQUID
Technical Name: None assigned.
Hazard Class/Division:3
Subsidiary Risk: None assigned.
Packing Group:II
Limited Quantity: None assigned.
Marine Pollutant: None assigned.
Marine Pollutant Technical Name: None assigned.
Other Dangerous Goods Descriptions:
None assigned.

Air Transport (IATA)

UN Number:UN1133
Proper Shipping Name:ADHESIVES CONTAINING FLAMMABLE LIQUID
Technical Name: None assigned.
Hazard Class/Division: None assigned.
Subsidiary Risk: None assigned.
Packing Group:II
Limited Quantity: None assigned.
Marine Pollutant: None assigned.
Marine Pollutant Technical Name: None assigned.
Other Dangerous Goods Descriptions:
None assigned.

Transportation classifications are provided as a customer service. As for shipping, YOU remain responsible for complying with all applicable laws and regulations, including proper transportation classification and packaging. 3M's transportation classifications are based on product formulation, packaging, 3M policies and 3M's understanding of applicable current regulations. 3M does not guarantee the accuracy of this classification information. This information applies only to transportation classification and not the packaging, labeling or marking requirements. The above information is only for reference. If you are shipping by air or ocean, YOU are advised to check & meet applicable regulatory requirements.

SECTION 15: Regulatory information

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

Global inventory status
Contact 3M for more information. The components of this material are in compliance with the provisions of the Korea Chemical Control Act. Certain restrictions may apply. Contact the selling division for additional information. The

components of this material are in compliance with the provisions of Australia National Industrial Chemical Notification and Assessment Scheme (NICNAS). Certain restrictions may apply. Contact the selling division for additional information. The components of this material are in compliance with the provisions of Japan Chemical Substance Control Law. Certain restrictions may apply. Contact the selling division for additional information. The components of this material are in compliance with the provisions of Philippines RA 6969 requirements. Certain restrictions may apply. Contact the selling division for additional information. The components of this product are in compliance with the new substance notification requirements of CEPA. This product complies with Measures on Environmental Management of New Chemical Substances. All ingredients are listed on or exempt from on China IECSC inventory. The components of this product are in compliance with the chemical notification requirements of TSCA. All required components of this product are listed on the active portion of the TSCA Inventory.

SECTION 16: Other information

DISCLAIMER: The information in this Safety Data Sheet (SDS) 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 SDS or use of the product in combination with other materials. For these reasons, it is important that customers carry out their own evaluation to satisfy themselves as to the suitability of the product for their own intended applications. In addition, this SDS is being provided to convey health and safety information. If you are the importer of record of this product into Malaysia, you are responsible for all applicable regulatory requirements, including, but not limited to, product registrations/notifications, substance volume tracking, and potential substance registration/notification.

3M Malaysia SDSs are available at www.3M.com.my