Safety Data Sheet

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Document Group:	35-1661-4	**Version Number:**	3.00
Issue Date:	27/12/2025	**Supersedes Date:**	02/12/2020

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™ Electrical Insulating Sealer 1601-C, Clear

Product Identification Numbers
80-6116-1660-0

1.2. Recommended use and restrictions on use

Recommended use
Electrical

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
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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 Aerosol: Category 2.
Gas Under Pressure: Liquefied gas.
Serious Eye Damage/Irritation: Category 2.
Carcinogenicity: Category 2.
Reproductive Toxicity: Category 1B.
Specific Target Organ Toxicity (single exposure): Category 1.
Specific Target Organ Toxicity (single exposure): Category 3.
Chronic Aquatic Toxicity: Category 3.

2.2. Label elements
Signal word

Danger

Symbols
Flame |Gas cylinder |Exclamation mark |Health Hazard |

Pictograms



Hazard Statements:

H223	Flammable aerosol.
H280	Contains gas under pressure; may explode if heated.
H319	Causes serious eye irritation.
H351	Suspected of causing cancer.
H360	May damage fertility or the unborn child.
H335	May cause respiratory irritation.
H370	Causes damage to organs: cardiovascular system.
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.
P211	Do not spray on an open flame or other ignition source.
P251	Do not pierce or burn, even after use.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
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.
P308 + P313	IF exposed or concerned: Get medical attention.

Storage:

P403	Store in a well-ventilated place.
P410 + P412	Protect from sunlight. Do not expose to temperatures exceeding 122°F (50°C).

Disposal:

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

2.3. Other hazards
Intentional misuse by deliberately concentrating and inhaling contents can be harmful or fatal., May cause drowsiness or dizziness., May displace oxygen and cause rapid suffocation., Repeated exposure may cause skin dryness or cracking.

SECTION 3: Composition/information on ingredients

This material is a mixture.

Ingredient	C.A.S. No.	% by Wt
Methyl Acetate	79-20-9	33 - 35
Methyl Ethyl Ketone	78-93-3	24 - 26
Propane	74-98-6	12 - 14
Butane	106-97-8	11 - 13
Resin Epoxy Ester	Trade Secret	5 - 10
BISPHENOL A-FORMALDEHYDE RESIN	25085-75-0	2 - 5
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	6846-50-0	2 - 4
MIBK	108-10-1	1 - 3
N-Butyl Acetate	123-86-4	1 - 3
Ca 2-Ethylhexanoate	136-51-6	<= 1
Zirconium Alkonate	22464-99-9	<= 1

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Remove person to fresh air. Get medical attention.

Skin Contact:
Wash with soap and water. If signs/symptoms develop, get medical attention.

Eye Contact:
Immediately flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. 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

Irritating to the respiratory tract (coughing, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain). Central nervous system depression (headache, dizziness, drowsiness, incoordination, nausea, slurred speech, giddiness, and unconsciousness). Target organ effects. See Section 11 for additional details.

4.3. Indication of any immediate medical attention and special treatment required
Exposure may increase myocardial irritability. Do not administer sympathomimetic drugs unless absolutely necessary.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media
Use a fire fighting agent suitable for the surrounding fire.

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
Carbon monoxide	During Combustion
Carbon dioxide	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.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
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. 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.

6.2. Environmental precautions
Avoid release to the environment.

6.3. Methods and material for containment and cleaning up
If possible, seal leaking container. Place leaking containers in a well-ventilated area, preferably an operating exhaust hood, or if necessary outdoors on an impermeable surface until appropriate packaging for the leaking container or its contents is available. Contain spill. Cover spill area with a fire extinguishing foam that is resistant to polar solvents. 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
Do not use in a confined area with minimal air exchange. Keep out of reach of children. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not spray on an open flame or other ignition source. Do not pierce or burn, even after use. 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. Avoid contact with oxidizing agents (eg. chlorine, chromic acid etc.) Use personal protective equipment (gloves, respirators, etc.) as required.

7.2. Conditions for safe storage including any incompatibilities
Store in a well-ventilated place. Keep container tightly closed. Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F. 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
Butane	106-97-8	Malaysia OELs	TWA(8 hours):1900 mg/m3(800 ppm)	
MIBK	108-10-1	ACGIH	TWA:20 ppm;STEL:75 ppm	A3: Confirmed animal carcin.
MIBK	108-10-1	Malaysia OELs	TWA(8 hours):205 mg/m3(50 ppm)	
Butyl acetates, all isomers	123-86-4	ACGIH	TWA:50 ppm;STEL:150 ppm	
N-Butyl Acetate	123-86-4	Malaysia OELs	TWA(8 hours):713 mg/m3(150 ppm)	
Zirconium and compounds, as Zr	22464-99-9	ACGIH	TWA(as Zr):5 mg/m3;STEL(as Zr):10 mg/m3	A4: Not class. as human carcin
Zirconium and compounds, as Zr	22464-99-9	Malaysia OELs	TWA(as Zr)(8 hours):5 mg/m3	
Propane	74-98-6	ACGIH	Limit value not established:	simple asphyxiant
Propane	74-98-6	Malaysia OELs	TWA(8 hours):2500 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)	
Methyl Acetate	79-20-9	ACGIH	TWA:200 ppm;STEL:250 ppm	
Methyl Acetate	79-20-9	Malaysia OELs	TWA(8 hours):606 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
Do not remain in area where available oxygen may be reduced. 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.

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:
Safety Glasses with side shields
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

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 and particulates
Half facepiece or full facepiece supplied-air respirator
Organic vapor cartridges may have short service life.

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
Specific Physical Form:	Aerosol
Color	Colorless
Odor	Pungent Methyl Ethyl Ketone
Odor threshold	*No Data Available*
pH	*No Data Available*
Melting point/Freezing point	*Not Applicable*
Boiling point/Initial boiling point/Boiling range	*No Data Available*
Flash Point	-29 ºC [*Test Method:*Pensky-Martens Closed Cup]
Evaporation rate	5.6 [*Ref Std:*BUOAC=1]
Flammability	Flammable Aerosol: Category 2.
Flammable Limits(LEL)	1.38 %
Flammable Limits(UEL)	16 %
Vapor Pressure	13.5 kPa
Relative Vapor Density	1.55 [*Ref Std:*AIR=1]
Density	0.7 kg/l
Relative Density	0.76 [*Ref Std:*WATER=1]
Water solubility	*No Data Available*
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	20.5 mm2/sec
Volatile Organic Compounds	*No Data Available*
Percent volatile	*No Data Available*
VOC Less H2O & Exempt Solvents	*No Data Available*
Molecular weight	*Not Applicable*

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
Sparks and/or flames

10.5. Incompatible materials
Not determined

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:
May be harmful if inhaled.
Simple Asphyxiation: Signs/symptoms may include increased heart rate, rapid respirations, drowsiness, headache, incoordination, altered judgement, nausea, vomiting, lethargy, seizures, coma, and may be fatal.

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:
Prolonged or repeated exposure may cause: Dermal Defatting: Signs/symptoms may include localized redness, itching, drying and cracking of skin.

Eye Contact:
Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.

Ingestion:
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.

Respiratory Effects: Signs/symptoms may include cough, shortness of breath, chest tightness, wheezing, increased heart rate, bluish colored skin (cyanosis), sputum production, changes in lung function tests, and/or respiratory failure.

Single exposure, above recommended guidelines, may cause: Cardiac Sensitization: Signs/symptoms may include irregular heartbeat (arrhythmia), faintness, chest pain, and may be fatal.

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

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	Inhalation-Vapor(4 hr)		No data available; calculated ATE >20 - =50 mg/l
Overall product	Ingestion		No data available; calculated ATE >5,000 mg/kg
Methyl Acetate	Dermal	Rat	LD50 > 2,000 mg/kg
Methyl Acetate	Inhalation-Vapor (4 hours)	Rat	LC50 > 49 mg/l
Methyl Acetate	Ingestion	Rat	LD50 > 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
Propane	Inhalation-Gas (4 hours)	Rat	LC50 > 200,000 ppm
Butane	Inhalation-Gas (4 hours)	Rat	LC50 277,000 ppm
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	Dermal	Guinea pig	LD50 > 18,800 mg/kg
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 8 mg/l
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	Ingestion	Rat	LD50 > 3,200 mg/kg
MIBK	Dermal	Rabbit	LD50 > 16,000 mg/kg
MIBK	Inhalation-Vapor (4 hours)	Rat	LC50 11 mg/l
MIBK	Ingestion	Rat	LD50 3,038 mg/kg
N-Butyl Acetate	Dermal	Rabbit	LD50 > 14,112 mg/kg
N-Butyl Acetate	Inhalation-Dust/Mist (4 hours)	Rat	LC50 1.8 mg/l
N-Butyl Acetate	Inhalation-Vapor (4 hours)	Rat	LC50 > 21 mg/l
N-Butyl Acetate	Ingestion	Rat	LD50 > 10,760 mg/kg
Ca 2-Ethylhexanoate	Dermal	Rabbit	LD50 > 5,000 mg/kg
Ca 2-Ethylhexanoate	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 1.2 mg/l
Ca 2-Ethylhexanoate	Ingestion	Rat	LD50 >300, <2000 mg/kg

Zirconium Alkonate	Dermal	similar compounds	LD50 > 2,000 mg/kg
Zirconium Alkonate	Inhalation-Dust/Mist (4 hours)	similar compounds	LC50 > 4.3 mg/l
Zirconium Alkonate	Ingestion	similar compounds	LD50 2,043 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Methyl Acetate	Rabbit	No significant irritation
Methyl Ethyl Ketone	Rabbit	Minimal irritation
Propane	Rabbit	Minimal irritation
Butane	Professional judgement	No significant irritation
MIBK	Rabbit	Mild irritant
N-Butyl Acetate	Rabbit	No significant irritation
Ca 2-Ethylhexanoate	Rabbit	No significant irritation
Zirconium Alkonate	Rabbit	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value
Methyl Acetate	Rabbit	Moderate irritant
Methyl Ethyl Ketone	Rabbit	Severe irritant
Propane	Rabbit	Mild irritant
Butane	Rabbit	No significant irritation
MIBK	Rabbit	Mild irritant
N-Butyl Acetate	Human	Mild irritant
Ca 2-Ethylhexanoate	Rabbit	Corrosive
Zirconium Alkonate	Rabbit	No significant irritation

Sensitization:

Skin Sensitization

Name	Species	Value
Methyl Acetate	Human	Not classified
MIBK	Guinea pig	Not classified
N-Butyl Acetate	Multiple animal species	Not classified
Zirconium Alkonate	similar compounds	Not classified

Respiratory Sensitization

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

Germ Cell Mutagenicity

Name	Route	Value
Methyl Acetate	In Vitro	Not mutagenic
Methyl Acetate	In vivo	Not mutagenic
Methyl Ethyl Ketone	In Vitro	Not mutagenic

Propane	In Vitro	Not mutagenic
Butane	In Vitro	Not mutagenic
MIBK	In Vitro	Not mutagenic
N-Butyl Acetate	In Vitro	Not mutagenic
Ca 2-Ethylhexanoate	In Vitro	Not mutagenic

Carcinogenicity

Name	Route	Species	Value
Methyl Ethyl Ketone	Inhalation	Human	Not carcinogenic
MIBK	Inhalation	Multiple animal species	Carcinogenic

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
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	Ingestion	Toxic to development	Rabbit	NOAEL 300 mg/kg/day	during gestation
MIBK	Inhalation	Not classified for female reproduction	Multiple animal species	NOAEL 8.2 mg/l	2 generation
MIBK	Ingestion	Not classified for male reproduction	Rat	NOAEL 1,000 mg/kg/day	13 weeks
MIBK	Inhalation	Not classified for male reproduction	Multiple animal species	NOAEL 8.2 mg/l	2 generation
MIBK	Inhalation	Not classified for development	Mouse	NOAEL 12.3 mg/l	during organogenesis
N-Butyl Acetate	Inhalation	Not classified for female reproduction	Rat	NOAEL 9.5 mg/l	2 generation
N-Butyl Acetate	Inhalation	Not classified for male reproduction	Rat	NOAEL 9.5 mg/l	2 generation
N-Butyl Acetate	Inhalation	Not classified for development	Rat	NOAEL 3.6 mg/l	2 generation
Ca 2-Ethylhexanoate	Ingestion	Not classified for female reproduction	similar compounds	NOAEL 800 mg/kg/day	2 generation
Ca 2-Ethylhexanoate	Ingestion	Not classified for male reproduction	similar compounds	NOAEL 800 mg/kg/day	2 generation
Ca 2-Ethylhexanoate	Ingestion	Toxic to development	similar compounds	NOAEL 100 mg/kg/day	during gestation
Zirconium Alkonate	Ingestion	Not classified for female reproduction	similar compounds	NOAEL 800 mg/kg/day	1 generation
Zirconium Alkonate	Ingestion	Not classified for male reproduction	similar compounds	NOAEL 800 mg/kg/day	1 generation
Zirconium Alkonate	Ingestion	Toxic to development	similar compounds	NOAEL 100 mg/kg/day	during organogenesis

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Methyl Acetate	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and	NOAEL Not available	

				animal		
Methyl Acetate	Inhalation	respiratory irritation	May cause respiratory irritation	Human and animal	NOAEL Not available	
Methyl Acetate	Inhalation	blindness	Not classified		NOAEL Not available	
Methyl Acetate	Ingestion	central nervous system depression	May cause drowsiness or dizziness		NOAEL Not available	
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
Propane	Inhalation	cardiac sensitization	Causes damage to organs	Human	NOAEL Not available	
Propane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
Propane	Inhalation	respiratory irritation	Not classified	Human	NOAEL Not available	
Butane	Inhalation	cardiac sensitization	Causes damage to organs	Human	NOAEL Not available	
Butane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and animal	NOAEL Not available	
Butane	Inhalation	heart	Not classified	Dog	NOAEL 5,000 ppm	25 minutes
Butane	Inhalation	respiratory irritation	Not classified	Rabbit	NOAEL Not available	
MIBK	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	LOAEL 0.1 mg/l	2 hours
MIBK	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	
MIBK	Inhalation	vascular system	Not classified	Dog	NOAEL Not available	not available
MIBK	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Rat	LOAEL 900 mg/kg	not applicable
N-Butyl Acetate	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	not available
N-Butyl Acetate	Inhalation	respiratory irritation	May cause respiratory irritation	Human	NOAEL Not available	not available
N-Butyl Acetate	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Not available	
Ca 2-Ethylhexanoate	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	similar health hazards	NOAEL not available	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Methyl Acetate	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 1.1 mg/l	28 days
Methyl Acetate	Inhalation	endocrine system	Not classified	Rat	NOAEL 6.1 mg/l	28 days
Methyl Acetate	Inhalation	hematopoietic	Not classified	Rat	NOAEL 6.1	28 days

		system			mg/l	
Methyl Acetate	Inhalation	liver	Not classified	Rat	NOAEL 6.1 mg/l	28 days
Methyl Acetate	Inhalation	immune system	Not classified	Rat	NOAEL 6.1 mg/l	28 days
Methyl Acetate	Inhalation	kidney and/or bladder	Not classified	Rat	NOAEL 6.1 mg/l	28 days
Methyl Ethyl Ketone	Dermal	nervous system	Not classified	Guinea pig	NOAEL Not available	31 weeks
Methyl Ethyl Ketone	Inhalation	liver	Not classified	Rat	NOAEL 14.7 mg/l	90 days
Methyl Ethyl Ketone	Inhalation	kidney and/or bladder	Not classified	Rat	NOAEL 14.7 mg/l	90 days
Methyl Ethyl Ketone	Inhalation	heart	Not classified	Rat	NOAEL 14.7 mg/l	90 days
Methyl Ethyl Ketone	Inhalation	endocrine system	Not classified	Rat	NOAEL 14.7 mg/l	90 days
Methyl Ethyl Ketone	Inhalation	gastrointestinal tract	Not classified	Rat	NOAEL 14.7 mg/l	90 days
Methyl Ethyl Ketone	Inhalation	bone, teeth, nails, and/or hair	Not classified	Rat	NOAEL 14.7 mg/l	90 days
Methyl Ethyl Ketone	Inhalation	hematopoietic system	Not classified	Rat	NOAEL 14.7 mg/l	90 days
Methyl Ethyl Ketone	Inhalation	immune system	Not classified	Rat	NOAEL 14.7 mg/l	90 days
Methyl Ethyl Ketone	Inhalation	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
Butane	Inhalation	kidney and/or bladder	Not classified	Rat	NOAEL 4,489 ppm	90 days
Butane	Inhalation	blood	Not classified	Rat	NOAEL 4,489 ppm	90 days
MIBK	Inhalation	liver	Not classified	Rat	NOAEL 0.41 mg/l	13 weeks
MIBK	Inhalation	heart	Not classified	Multiple animal species	NOAEL 0.8 mg/l	2 weeks
MIBK	Inhalation	kidney and/or bladder	Not classified	Multiple animal species	NOAEL 0.4 mg/l	90 days
MIBK	Inhalation	respiratory system	Not classified	Multiple animal species	NOAEL 4.1 mg/l	14 weeks
MIBK	Inhalation	endocrine system	Not classified	Multiple animal species	NOAEL 0.41 mg/l	90 days
MIBK	Inhalation	hematopoietic system	Not classified	Multiple animal species	NOAEL 0.41 mg/l	90 days
MIBK	Inhalation	nervous system	Not classified	Multiple animal species	NOAEL 0.41 mg/l	13 weeks
MIBK	Ingestion	endocrine system	Not classified	Rat	NOAEL 1,000 mg/kg/day	13 weeks
MIBK	Ingestion	hematopoietic system	Not classified	Rat	NOAEL 1,000 mg/kg/day	13 weeks
MIBK	Ingestion	liver	Not classified	Rat	NOAEL 1,000 mg/kg/day	13 weeks
MIBK	Ingestion	kidney and/or bladder	Not classified	Rat	NOAEL 1,000 mg/kg/day	13 weeks

MIBK	Ingestion	heart	Not classified	Rat	NOAEL 1,040 mg/kg/day	120 days
MIBK	Ingestion	immune system	Not classified	Rat	NOAEL 1,040 mg/kg/day	120 days
MIBK	Ingestion	muscles	Not classified	Rat	NOAEL 1,040 mg/kg/day	120 days
MIBK	Ingestion	nervous system	Not classified	Rat	NOAEL 1,040 mg/kg/day	120 days
MIBK	Ingestion	respiratory system	Not classified	Rat	NOAEL 1,040 mg/kg/day	120 days
N-Butyl Acetate	Inhalation	endocrine system	Not classified	Rat	NOAEL 9.6 mg/l	13 weeks
N-Butyl Acetate	Inhalation	hematopoietic system	Not classified	Rat	NOAEL 9.6 mg/l	13 weeks
N-Butyl Acetate	Inhalation	liver	Not classified	Rat	NOAEL 9.6 mg/l	13 weeks
N-Butyl Acetate	Inhalation	nervous system	Not classified	Rat	NOAEL 9.6 mg/l	13 weeks
N-Butyl Acetate	Inhalation	kidney and/or bladder	Not classified	Rat	NOAEL 9.6 mg/l	13 weeks
N-Butyl Acetate	Inhalation	gastrointestinal tract	Not classified	Rat	NOAEL 4.8 mg/l	13 weeks
N-Butyl Acetate	Inhalation	respiratory system	Not classified	Rat	NOAEL 4.8 mg/l	13 weeks
N-Butyl Acetate	Inhalation	heart	Not classified	Rat	NOAEL 9.6 mg/l	13 weeks
N-Butyl Acetate	Inhalation	bone, teeth, nails, and/or hair	Not classified	Rat	NOAEL 9.6 mg/l	13 weeks
N-Butyl Acetate	Inhalation	immune system	Not classified	Rat	NOAEL 9.6 mg/l	13 weeks
N-Butyl Acetate	Inhalation	eyes	Not classified	Rat	NOAEL 9.6 mg/l	13 weeks
N-Butyl Acetate	Inhalation	vascular system	Not classified	Rat	NOAEL 9.6 mg/l	13 weeks

Aspiration Hazard

Name	Value
MIBK	Some positive data exist, but the data are 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 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 Acetate	79-20-9	Green algae	Experimental	72 hours	ErC50	>120 mg/l
Methyl Acetate	79-20-9	Water flea	Experimental	48 hours	EC50	1,026.7 mg/l
Methyl Acetate	79-20-9	Zebra Fish	Experimental	96 hours	LC50	250 mg/l
Methyl Acetate	79-20-9	Green algae	Experimental	72 hours	NOEC	120 mg/l
Methyl Acetate	79-20-9	Bacteria	Experimental	16 hours	EC50	6,000 mg/l
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
Propane	74-98-6	N/A	Data not available or insufficient for classification	N/A	N/A	N/A
Butane	106-97-8	N/A	Data not available or insufficient for classification	N/A	N/A	N/A
Resin Epoxy Ester	Trade Secret	N/A	Data not available or insufficient for classification	N/A	N/A	N/A
BISPHENOL A-FORMALDEHYDE RESIN	25085-75-0	N/A	Data not available or insufficient for classification	N/A	N/A	N/A
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	6846-50-0	Green algae	Experimental	72 hours	EbC50	8 mg/l
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	6846-50-0	Medaka	Experimental	96 hours	LC50	18 mg/l
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	6846-50-0	Green algae	Experimental	72 hours	NOEC	5.3 mg/l
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	6846-50-0	Water flea	Experimental	21 days	NOEC	0.7 mg/l
MIBK	108-10-1	Green algae	Experimental	96 hours	EC50	400 mg/l
MIBK	108-10-1	Water flea	Experimental	48 hours	EC50	>200 mg/l
MIBK	108-10-1	Zebra Fish	Experimental	96 hours	LC50	>179 mg/l
MIBK	108-10-1	Fathead Minnow	Experimental	32 days	NOEC	56.2 mg/l
MIBK	108-10-1	Water flea	Experimental	21 days	NOEC	78 mg/l
MIBK	108-10-1	Activated sludge	Experimental	30 minutes	EC50	>1,000
N-Butyl Acetate	123-86-4	Green algae	Analogous Compound	72 hours	ErC50	397 mg/l
N-Butyl Acetate	123-86-4	Fathead Minnow	Experimental	96 hours	LC50	18 mg/l
N-Butyl Acetate	123-86-4	Water flea	Experimental	48 hours	EC50	44 mg/l
N-Butyl Acetate	123-86-4	Green algae	Analogous Compound	72 hours	NOEC	196 mg/l
N-Butyl Acetate	123-86-4	Water flea	Analogous	21 days	NOEC	23.2 mg/l

			Compound			
N-Butyl Acetate	123-86-4	Ciliated protozoa	Experimental	40 hours	IC50	356 mg/l
N-Butyl Acetate	123-86-4	Lettuce	Experimental	14 days	EC50	>1,000 mg/kg (Dry Weight)
Ca 2-Ethylhexanoate	136-51-6	Activated sludge	Transformation Product	30 minutes	EC20	740 mg/l
Ca 2-Ethylhexanoate	136-51-6	Green algae	Transformation Product	72 hours	ErC50	56 mg/l
Ca 2-Ethylhexanoate	136-51-6	Medaka	Transformation Product	96 hours	LC50	>113 mg/l
Ca 2-Ethylhexanoate	136-51-6	Water flea	Transformation Product	48 hours	EC50	97 mg/l
Ca 2-Ethylhexanoate	136-51-6	Green algae	Transformation Product	96 hours	ErC10	28 mg/l
Ca 2-Ethylhexanoate	136-51-6	Water flea	Transformation Product	21 days	NOEC	28 mg/l
Zirconium Alkonate	22464-99-9	Green algae	Analogous Compound	96 hours	ErC50	44.4 mg/l
Zirconium Alkonate	22464-99-9	Medaka	Analogous Compound	96 hours	LC50	>100 mg/l
Zirconium Alkonate	22464-99-9	Water flea	Analogous Compound	48 hours	EC50	85.4 mg/l
Zirconium Alkonate	22464-99-9	Green algae	Analogous Compound	96 hours	ErC10	27.9 mg/l
Zirconium Alkonate	22464-99-9	Water flea	Analogous Compound	21 days	NOEC	18 mg/l
Zirconium Alkonate	22464-99-9	Activated sludge	Analogous Compound	30 minutes	EC20	650 mg/l
Zirconium Alkonate	22464-99-9	Bacteria	Analogous Compound	17 hours	EC50	112.1 mg/l

12.2. Persistence and degradability

Material	CAS No.	Test Type	Duration	Study Type	Test Result	Protocol
Methyl Acetate	79-20-9	Experimental Biodegradation	28 days	Biological Oxygen Demand	70 %BOD/ThOD	OECD 301D - Closed Bottle Test
Methyl Acetate	79-20-9	Experimental Aquatic Inherent Biodegrad.	6 days	Dissolv. Organic Carbon Deplet	>95 %removal of DOC	OECD 302B Zahn-Wellens/EVPA
Methyl Acetate	79-20-9	Experimental Photolysis		Photolytic half-life (in air)	94 days (t 1/2)	
Methyl Acetate	79-20-9	Experimental Hydrolysis		Hydrolytic half-life	44 days (t 1/2)	
Methyl Ethyl Ketone	78-93-3	Experimental Biodegradation	28 days	Biological Oxygen Demand	98 %BOD/ThOD	OECD 301D - Closed Bottle Test
Propane	74-98-6	Experimental Photolysis		Photolytic half-life (in air)	27.5 days (t 1/2)	
Butane	106-97-8	Experimental Photolysis		Photolytic half-life (in air)	12.3 days (t 1/2)	
Resin Epoxy Ester	Trade Secret	Data not availbl-insufficient	N/A	N/A	N/A	N/A
BISPHENOL A-FORMALDEHYDE RESIN	25085-75-0	Data not availbl-insufficient	N/A	N/A	N/A	N/A
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	6846-50-0	Experimental Biodegradation	28 days	Carbon dioxide evolution	70.73 %CO2 evolution/THCO2 evolution (does not pass 10-day window)	OECD 301B - Mod. Sturm or CO2
MIBK	108-10-1	Experimental Biodegradation	28 days	Biological Oxygen Demand	83 %BOD/ThOD	OECD 301F - Manometric Respiro
MIBK	108-10-1	Experimental Photolysis		Photolytic half-life (in air)	2.3 days (t 1/2)	
N-Butyl Acetate	123-86-4	Experimental	28 days	Biological Oxygen	83 %BOD/ThOD	OECD 301D - Closed Bottle

		Biodegradation		Demand		Test
N-Butyl Acetate	123-86-4	Experimental Photolysis		Photolytic half-life (in air)	6.3 days (t 1/2)	
N-Butyl Acetate	123-86-4	Experimental Hydrolysis		Hydrolytic half-life (pH 7)	3.1 years (t 1/2)	
Ca 2-Ethylhexanoate	136-51-6	Transformation product Biodegradation	28 days	Dissolv. Organic Carbon Deplet	99 %removal of DOC	OECD 301E - Modif. OECD Screen
Zirconium Alkonate	22464-99-9	Experimental Biodegradation	28 days	Carbon dioxide evolution	73.82 %CO2 evolution/THCO2 evolution (does not pass 10-day window)	OECD 301B - Mod. Sturm or CO2
Zirconium Alkonate	22464-99-9	Analogous Compound Biodegradation	28 days	Dissolv. Organic Carbon Deplet	99 %removal of DOC	OECD 301E - Modif. OECD Screen
Zirconium Alkonate	22464-99-9	Analogous Compound Aquatic Inherent Biodegrad.	5 days	Dissolv. Organic Carbon Deplet	>95 %removal of DOC	OECD 302B Zahn-Wellens/EVPA

12.3. Bioaccumulative potential

Material	CAS No.	Test Type	Duration	Study Type	Test Result	Protocol
Methyl Acetate	79-20-9	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	0.18	
Methyl Ethyl Ketone	78-93-3	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	0.3	OECD 117 log Kow HPLC method
Propane	74-98-6	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	2.36	
Butane	106-97-8	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	2.89	
Resin Epoxy Ester	Trade Secret	Data not available or insufficient for classification	N/A	N/A	N/A	N/A
BISPHENOL A-FORMALDEHYDE RESIN	25085-75-0	Estimated Bioconcentration		Bioaccumulation Factor	7.4	
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	6846-50-0	Experimental BAF - Fish	42 days	Bioaccumulation Factor	≤31	OECD305-Bioconcentration
MIBK	108-10-1	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	1.9	OECD 117 log Kow HPLC method
N-Butyl Acetate	123-86-4	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	2.3	OECD 117 log Kow HPLC method
Ca 2-Ethylhexanoate	136-51-6	Transformation product Bioconcentration		Log of Octanol/H2O part. coeff	2.7	similar to OECD 107
Zirconium Alkonate	22464-99-9	Analogous Compound Bioconcentration		Log of Octanol/H2O part. coeff	2.7	similar to OECD 107

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:UN1950
Proper Shipping Name:AEROSOLS, FLAMMABLE
Technical Name: None assigned.
Hazard Class/Division:2.1
Subsidiary Risk: None assigned.
Packing Group: None assigned.
Limited Quantity: Yes
Marine Pollutant: None assigned.
Marine Pollutant Technical Name: None assigned.
Other Dangerous Goods Descriptions:
None assigned.

Air Transport (IATA)

UN Number:UN1950
Proper Shipping Name:AEROSOLS, FLAMMABLE
Technical Name: None assigned.
Hazard Class/Division:2.1
Subsidiary Risk: None assigned.
Packing Group: None assigned.
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 product are in compliance with the new substance notification requirements of CEPA. 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.

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