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™ Zinc Spray 16-501

Product Identification Numbers
80-6109-2798-2 80-6116-1654-3

1.2. Recommended use and restrictions on use

Recommended use
PROTECTIVE COATING, protective coating

Restrictions on use
INDUSTRIAL USE ONLY

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

2.2. Label elements
Signal word
Danger

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

Pictograms

Hazard Statements

H222	Extremely flammable aerosol.
H280	Contains gas under pressure; may explode if heated.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H360	May damage fertility or the unborn child.
H370	Causes damage to organs: cardiovascular system |
H373	May cause damage to organs through prolonged or repeated exposure: nervous system | sensory organs |
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention:

P201	Obtain special instructions before use.
P210	Keep away from heat/sparks/open flames/hot surfaces. - 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.
P280A	Wear eye/face protection.
P281	Use personal protective equipment as required.
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.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P332 + P313	If skin irritation occurs: Get medical advice/attention.
P307 + P311	IF exposed: Call a POISON CENTER or doctor/physician.

Storage:

P410 + P412	Protect from sunlight. Do not expose to temperatures exceeding 50C/122F.
P403	Store in a well-ventilated place.
P405	Store locked up.

Disposal:

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

2.3. Other hazards

Intentional misuse by deliberately concentrating and inhaling contents can be harmful or fatal.
May cause drowsiness or dizziness.

SECTION 3: Composition/information on ingredients

This material is a mixture.

Ingredient	C.A.S. No.	% by Wt
ZINC	7440-66-6	45 - 53
BUTANE	106-97-8	10 - 15
PROPANE	74-98-6	10 - 15
METHYL ETHYL KETONE (MEK)	78-93-3	8 - 13
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	64742-89-8	4 - 9
HEPTANE	142-82-5	2 - 5
Resin Epoxy Ester	66070-75-5	1 - 5
TOLUENE	108-88-3	2 - 5

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

No critical symptoms or effects. See Section 11.1, information on toxicological effects.

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

In case of fire: Use a carbon dioxide or dry chemical extinguisher 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
Carbon monoxide	During Combustion

Carbon dioxide	During Combustion
Oxides of Lead	During Combustion
Oxides of Zinc	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
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. 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
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. 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. 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 use in a confined area with minimal air exchange. 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 50C/122F. Store away from heat. Store away from acids. Store away from strong bases. 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	ACGIH	STEL:1000 ppm	
BUTANE	106-97-8	Malaysia OELs	TWA(8 hours):1900 mg/m3(800 ppm)	

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
HEPTANE	142-82-5	ACGIH	TWA:400 ppm;STEL:500 ppm	
HEPTANE	142-82-5	Malaysia OELs	TWA(8 hours):1640 mg/m3(400 ppm)	
Naphtha	64742-89-8	Malaysia OELs	TWA(8 hours):1590 mg/m3(400 ppm)	
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 (MEK)	78-93-3	ACGIH	TWA:200 ppm;STEL:300 ppm	
METHYL ETHYL KETONE (MEK)	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
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:
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 respirators 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:	Compressed Gas
Color	Gray
Odor	Hydrocarbon
Odor threshold	*No Data Available*
pH	*Not Applicable*
Melting point/Freezing point	*Not Applicable*
Boiling point/Initial boiling point/Boiling range	-42.2 - 162.8 ºC
Flash Point	-61.1 ºC [*Test Method:*Closed Cup] [*Details:*Based on butane]
Evaporation rate	>=1 [*Ref Std:*ETHER=1]
Flammability (solid, gas)	Not Applicable
Flammable Limits(LEL)	0.9 %
Flammable Limits(UEL)	Approximately 10 %
Vapor Pressure	*No Data Available*
Vapor Density and/or Relative Vapor Density	*No Data Available*
Density	1,144 kg/l
Relative Density	1.15 [*Ref Std:*WATER=1] [*Details:*Reference standard: 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*
Viscosity/Kinematic Viscosity	*No Data Available*
Volatile Organic Compounds	Approximately 52 g/l *No Data Available*
Percent volatile	Approximately 88 % volume
VOC Less H2O & Exempt Solvents	*No Data Available*

Nanoparticles
This material does not contain nanoparticles.

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 acids
Strong bases

Strong oxidizing agents

10.6. Hazardous decomposition products

Substance	Condition
Hydrocarbons	Normal Use
Ketones	Normal Use
Toxic Vapor, Gas, Particulate	Normal Use

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:
Mild Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, and dryness.

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

Cardiac Sensitization: Signs/symptoms may include irregular heartbeat (arrhythmia), faintness, chest pain, and may be fatal.

Prolonged or repeated exposure may cause target organ effects:
Ocular Effects: Signs/symptoms may include blurred or significantly impaired vision.

Auditory Effects: Signs/symptoms may include hearing impairment, balance dysfunction and ringing in the ears.

Olfactory Effects: Signs/symptoms may include decreased ability to detect odors and/or complete loss of smell.

Neurological Effects: Signs/symptoms may include personality changes, lack of coordination, sensory loss, tingling or numbness of the extremities, weakness, tremors, and/or changes in blood pressure and heart rate.

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

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-Dust/Mist(4 hr)		No data available; calculated ATE5 - 12.5 mg/l
Overall product	Ingestion		No data available; calculated ATE >5,000 mg/kg
ZINC	Dermal	Professional judgement	LD50 estimated to be > 5,000 mg/kg
ZINC	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 5.41 mg/l
ZINC	Ingestion	Rat	LD50 > 2,000 mg/kg
PROPANE	Inhalation-Gas (4 hours)	Rat	LC50 > 200,000 ppm
METHYL ETHYL KETONE (MEK)	Dermal	Rabbit	LD50 > 8,050 mg/kg
METHYL ETHYL KETONE (MEK)	Inhalation-Vapor (4 hours)	Rat	LC50 34.5 mg/l
METHYL ETHYL KETONE (MEK)	Ingestion	Rat	LD50 2,737 mg/kg
BUTANE	Inhalation-Gas (4 hours)	Rat	LC50 277,000 ppm
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
HEPTANE	Dermal	Rabbit	LD50 3,000 mg/kg
HEPTANE	Inhalation-Vapor (4 hours)	Rat	LC50 103 mg/l
HEPTANE	Ingestion	Rat	LD50 > 15,000 mg/kg
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	Dermal	Rabbit	LD50 3,000 mg/kg
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	Inhalation-Vapor (4 hours)	Rat	LC50 > 5.2 mg/l
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	Ingestion	Rat	LD50 > 5,000 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value

PROPANE	Rabbit	Minimal irritation
METHYL ETHYL KETONE (MEK)	Rabbit	Minimal irritation
BUTANE	Professional judgement	No significant irritation
TOLUENE	Rabbit	Irritant
HEPTANE	Human	Mild irritant
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	Rabbit	Irritant

Serious Eye Damage/Irritation

Name	Species	Value
ZINC	Rabbit	No significant irritation
PROPANE	Rabbit	Mild irritant
METHYL ETHYL KETONE (MEK)	Rabbit	Severe irritant
BUTANE	Rabbit	No significant irritation
TOLUENE	Rabbit	Moderate irritant
HEPTANE	Professional judgement	Moderate irritant
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	Rabbit	No significant irritation

Sensitization:

Skin Sensitization

Name	Species	Value
TOLUENE	Guinea pig	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
PROPANE	In Vitro	Not mutagenic
METHYL ETHYL KETONE (MEK)	In Vitro	Not mutagenic
BUTANE	In Vitro	Not mutagenic
TOLUENE	In Vitro	Not mutagenic
TOLUENE	In vivo	Not mutagenic
HEPTANE	In Vitro	Not mutagenic
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	In Vitro	Not mutagenic

Carcinogenicity

Name	Route	Species	Value
METHYL ETHYL KETONE (MEK)	Inhalation	Human	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
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	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
METHYL ETHYL KETONE (MEK)	Inhalation	Not classified for development	Rat	LOAEL 8.8 mg/l	during gestation
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
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	
METHYL ETHYL KETONE (MEK)	Inhalation	central nervous system depression	May cause drowsiness or dizziness	official classification	NOAEL Not available	
METHYL ETHYL KETONE (MEK)	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	
METHYL ETHYL KETONE (MEK)	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Not available	
METHYL ETHYL KETONE (MEK)	Ingestion	liver	Not classified	Rat	NOAEL Not available	not applicable
METHYL ETHYL KETONE (MEK)	Ingestion	kidney and/or bladder	Not classified	Rat	LOAEL 1,080 mg/kg	not applicable
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	
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
HEPTANE	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
HEPTANE	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	
HEPTANE	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and animal	NOAEL Not available	

SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification		NOAEL Not available	
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Not available	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
METHYL ETHYL KETONE (MEK)	Dermal	nervous system	Not classified	Guinea pig	NOAEL Not available	31 weeks
METHYL ETHYL KETONE (MEK)	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 (MEK)	Ingestion	liver	Not classified	Rat	NOAEL Not available	7 days
METHYL ETHYL KETONE (MEK)	Ingestion	nervous system	Not classified	Rat	NOAEL 173 mg/kg/day	90 days
BUTANE	Inhalation	kidney and/or bladder | blood	Not classified	Rat	NOAEL 4,489 ppm	90 days
TOLUENE	Inhalation	auditory system | eyes | olfactory system	Causes damage to organs through prolonged or repeated exposure	Human	NOAEL Not available	poisoning and/or abuse
TOLUENE	Inhalation	nervous system	May cause damage to organs though 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
HEPTANE	Inhalation	liver | nervous	Not classified	Rat	NOAEL 12	26 weeks

		system | kidney and/or bladder			mg/l	

Aspiration Hazard

Name	Value
TOLUENE	Aspiration hazard
HEPTANE	Aspiration hazard
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	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

Chronic aquatic hazard:
GHS Chronic 1: Very toxic to aquatic life with long lasting effects.

No product test data available

Material	Cas #	Organism	Type	Exposure	Test Endpoint	Test Result
ZINC	7440-66-6	Bacteria	Estimated	30 minutes	Effect Concentration 10%	0.3 mg/l
ZINC	7440-66-6	Green Algae	Estimated	72 hours	Effect Concentration 50%	0.042 mg/l
ZINC	7440-66-6	Rainbow Trout	Estimated	96 hours	Lethal Concentration 50%	0.169 mg/l
ZINC	7440-66-6	Water flea	Estimated	48 hours	Effect Concentration 50%	0.06 mg/l
ZINC	7440-66-6	Green Algae	Estimated	72 hours	No obs Effect Conc	0.005 mg/l
ZINC	7440-66-6	Water flea	Estimated	7 days	No obs Effect Conc	0.013 mg/l
BUTANE	106-97-8		Data not available or insufficient for classification			N/A
PROPANE	74-98-6		Data not available or insufficient for classification			N/A
METHYL ETHYL KETONE (MEK)	78-93-3	Activated sludge	Experimental	12 hours	Inhibitory Concentration 50%	1,873 mg/l

METHYL ETHYL KETONE (MEK)	78-93-3	Bacteria	Experimental	16 hours	No obs Effect Conc	1,150 mg/l
METHYL ETHYL KETONE (MEK)	78-93-3	Fathead Minnow	Experimental	96 hours	Lethal Concentration 50%	2,993 mg/l
METHYL ETHYL KETONE (MEK)	78-93-3	Green algae	Experimental	96 hours	Effect Concentration 50%	2,029 mg/l
METHYL ETHYL KETONE (MEK)	78-93-3	Water flea	Experimental	48 hours	Effect Concentration 50%	308 mg/l
METHYL ETHYL KETONE (MEK)	78-93-3	Green Algae	Experimental	96 hours	Effect Concentration 10%	1,289 mg/l
METHYL ETHYL KETONE (MEK)	78-93-3	Water flea	Experimental	21 days	No obs Effect Conc	100 mg/l
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	64742-89-8	Fathead Minnow	Estimated	96 hours	Lethal Level 50%	4.1 mg/l
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	64742-89-8	Water flea	Estimated	48 hours	Effect Level 50%	4.5 mg/l
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	64742-89-8	Green algae	Experimental	72 hours	Effect Level 50%	11 mg/l
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	64742-89-8	Water flea	Estimated	21 days	No obs Effect Level	2.6 mg/l
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	64742-89-8	Green algae	Experimental	72 hours	No obs Effect Level	0.1 mg/l
HEPTANE	142-82-5	Water flea	Experimental	48 hours	Effect Concentration 50%	1.5 mg/l
HEPTANE	142-82-5	Water flea	Estimated	21 days	No obs Effect Conc	0.17 mg/l
Resin Epoxy	66070-75-5		Data not			n/a

Ester			available or insufficient for classification			
TOLUENE	108-88-3	Activated sludge	Experimental	12 hours	Inhibitory Concentration 50%	292 mg/l
TOLUENE	108-88-3	Bacteria	Experimental	3 hours	Effect Concentration 50%	193 mg/l
TOLUENE	108-88-3	Coho Salmon	Experimental	96 hours	Lethal Concentration 50%	5.5 mg/l
TOLUENE	108-88-3	Fish other	Experimental	96 hours	Lethal Concentration 50%	6.41 mg/l
TOLUENE	108-88-3	Green Algae	Experimental	72 hours	Effect Concentration 50%	12.5 mg/l
TOLUENE	108-88-3	Water flea	Experimental	48 hours	Effect Concentration 50%	3.78 mg/l
TOLUENE	108-88-3	Coho salmon	Experimental	40 days	No obs Effect Conc	3.2 mg/l
TOLUENE	108-88-3	Water flea	Experimental	7 days	No obs Effect Conc	0.74 mg/l

12.2. Persistence and degradability

Material	CAS No.	Test Type	Duration	Study Type	Test Result	Protocol
ZINC	7440-66-6	Data not availbl-insufficient			N/A	
BUTANE	106-97-8	Experimental Photolysis		Photolytic half-life (in air)	12.3 days (t 1/2)	Non-standard method
PROPANE	74-98-6	Experimental Photolysis		Photolytic half-life (in air)	27.5 days (t 1/2)	Non-standard method
METHYL ETHYL KETONE (MEK)	78-93-3	Experimental Biodegradation	28 days	Biological Oxygen Demand	98 % BOD/ThBOD	OECD 301D - Closed Bottle Test
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	64742-89-8	Estimated Biodegradation	28 days	Biological Oxygen Demand	77.05 % BOD/ThBOD	OECD 301F - Manometric Respiro
HEPTANE	142-82-5	Experimental Photolysis		Photolytic half-life (in air)	4.24 days (t 1/2)	Non-standard method
HEPTANE	142-82-5	Experimental Biodegradation	28 days	Biological Oxygen Demand	101 % BOD/ThBOD	OECD 301C - MITI (I)
Resin Epoxy Ester	66070-75-5	Data not availbl-insufficient			N/A	
TOLUENE	108-88-3	Experimental		Photolytic half-	5.2 days (t 1/2)	Non-standard method

		Photolysis		life (in air)		
TOLUENE	108-88-3	Experimental Biodegradation	20 days	Biological Oxygen Demand	80 % BOD/ThBOD	

12.3. Bioaccumulative potential

Material	CAS No.	Test Type	Duration	Study Type	Test Result	Protocol
ZINC	7440-66-6	Estimated BCF-Carp	56 days	Bioaccumulation Factor	242	Non-standard method
BUTANE	106-97-8	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	2.89	Non-standard method
PROPANE	74-98-6	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	2.36	Non-standard method
METHYL ETHYL KETONE (MEK)	78-93-3	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	0.29	Non-standard method
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	64742-89-8	Data not available or insufficient for classification	N/A	N/A	N/A	N/A
HEPTANE	142-82-5	Estimated Bioconcentration		Bioaccumulation Factor	105	Est: Bioconcentration factor
Resin Epoxy Ester	66070-75-5	Data not available or insufficient for classification	N/A	N/A	N/A	N/A
TOLUENE	108-88-3	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	2.73	Non-standard method

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: None assigned.
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 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 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 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 Malaysia SDSs are available at www.3M.com.my