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™ VHB™ Tape Universal Primer UV

Product Identification Numbers
70-0075-0487-4 70-0075-0502-0 70-0075-0505-3 70-0075-0506-1 70-0075-0507-9
70-0075-0508-7

1.2. Recommended use and restrictions on use

Recommended use
Adhesion Promoter

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 2.
Skin Corrosion/Irritation: Category 2.
Skin Sensitizer: Category 1.
Aspiration Hazard: Category 1.
Specific Target Organ Toxicity (single exposure): Category 3.
Chronic Aquatic Toxicity: Category 3.

2.2. Label elements
Signal word
Danger

Symbols
Flame | Exclamation mark | Health Hazard |

Pictograms

Hazard Statements

H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H304	May be fatal if swallowed and enters airways.
H335	May cause respiratory irritation.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statements
General:

P102	Keep out of reach of children.
P101	If medical advice is needed, have product container or label at hand.

Prevention:

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233	Keep container tightly closed.
P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P271	Use only outdoors or in a well-ventilated area.
P280B	Wear protective gloves and eye/face protection.

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.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.
P331	Do NOT induce vomiting.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P370 + P378G	In case of fire: Use a fire fighting agent suitable for flammable liquids such as dry chemical or carbon dioxide to extinguish.

Storage:

P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.

Disposal:

P501	Dispose of contents/container in accordance with applicable local/regional/national/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
Heptane, branched, cyclic and linear	426260-76-6	40 - 60
Methyl acetate	79-20-9	30 - 50
2-Methylhexane	591-76-4	10 - 20
3-Methylhexane	589-34-4	10 - 20
Non-volatile polymeric components	Trade Secret	1 - 6
Citric acid, tributyl ester, acetate	77-90-7	< 2
Dimethylcyclopentane	2532-58-3	< 2
Cyclohexane	110-82-7	< 1
Maleic Anhydride	108-31-6	< 0.1
Methylcyclohexane	108-87-2	< 1

SECTION 4: First aid measures

4.1. Description of first aid measures

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

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

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

If Swallowed:
Do not induce vomiting. Get immediate 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). Allergic skin reaction (redness, swelling, blistering, and itching). Aspiration pneumonitis (coughing, gasping, choking, burning of the mouth, and difficulty breathing). Central nervous system depression (headache, dizziness, drowsiness, incoordination, nausea, slurred speech, giddiness, and unconsciousness).

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
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. 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. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions
Avoid release to the environment. For larger spills, cover drains and build 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 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
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use only non-sparking tools. Take precautionary measures against static discharge. Avoid breathing 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. 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. Protect from sunlight. 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

Maleic Anhydride	108-31-6	ACGIH	TWA(inhalable fraction and vapor):0.01 mg/m3	A4: Not class. as human carcin, Dermal/Respiratory Sensitizer
Maleic Anhydride	108-31-6	Malaysia OELs	TWA(8 hours):1 mg/m3(0.25 ppm)	
Methylcyclohexane	108-87-2	ACGIH	TWA:400 ppm	
Methylcyclohexane	108-87-2	Malaysia OELs	TWA(8 hours):1610 mg/m3(400 ppm)	
Cyclohexane	110-82-7	ACGIH	TWA:100 ppm	
Cyclohexane	110-82-7	Malaysia OELs	TWA(8 hours):1030 mg/m3(300 ppm)	
3-Methylhexane	589-34-4	ACGIH	TWA:400 ppm;STEL:500 ppm	
Heptane, all isomers	589-34-4	Malaysia OELs	TWA(8 hours):1640 mg/m3(400 ppm)	
2-Methylhexane	591-76-4	ACGIH	TWA:400 ppm;STEL:500 ppm	
Heptane, all isomers	591-76-4	Malaysia OELs	TWA(8 hours):1640 mg/m3(400 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
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:
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 (eg. spraying, high splash potential etc.), then use of protective coveralls may be necessary. Select and use body protection to prevent contact based on the results of an exposure assessment. The following protective clothing material(s) are recommended: Apron - polymer laminate

Respiratory protection

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

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:	Liquid
Color	Colorless
Odor	Solvent
Odor threshold	*No Data Available*
pH	4.4
Melting point/Freezing point	*Not Applicable*
Boiling point/Initial boiling point/Boiling range	61.9 ºC [@ 101,324.72 Pa]
Flash Point	-10 ºC [*Test Method:*Closed Cup]
Evaporation rate	*No Data Available*
Flammability (solid, gas)	Not Applicable
Flammable Limits(LEL)	1.2 % [*Details:*Heptane]
Flammable Limits(UEL)	16 % [*Details:*Methyl Acetate]
Vapor Pressure	20,318.3 Pa [@ 20 ºC]
Vapor Density and/or Relative Vapor Density	*No Data Available*
Density	0.77 g/ml [@ 23 ºC]
Relative Density	0.77 [@ 23 ºC] [*Ref Std:*WATER=1]
Water solubility	23 % [@ 23 ºC]
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	1.9 mPa-s [@ 23.5 ºC]
Volatile Organic Compounds	429 g/l [*Test Method:*calculated SCAQMD rule 443.1]
Percent volatile	<=96 % weight [*Test Method:*Estimated]
VOC Less H2O & Exempt Solvents	700 g/l [*Test Method:*calculated SCAQMD rule 443.1]
Molecular weight	*Not Applicable*

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 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:
May be harmful if inhaled.
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:
Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, dryness, cracking, blistering, and pain.
Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

Eye Contact:
Moderate Eye Irritation: Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Ingestion:
Chemical (Aspiration) Pneumonitis: Signs/symptoms may include coughing, gasping, choking, burning of the mouth, difficulty breathing, bluish colored skin (cyanosis), and may be fatal.

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.

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 ATE20 - 50 mg/l
Overall product	Ingestion		No data available; calculated ATE >5,000 mg/kg
Heptane, branched, cyclic and linear	Dermal	Rabbit	LD50 > 2,920 mg/kg
Heptane, branched, cyclic and linear	Inhalation-Vapor (4 hours)	Rat	LC50 > 23.3 mg/l
Heptane, branched, cyclic and linear	Ingestion	Rat	LD50 > 5,840 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
3-Methylhexane	Dermal	Rabbit	LD50 3,000 mg/kg
3-Methylhexane	Inhalation-Vapor (4 hours)	Rat	LC50 > 80 mg/l
3-Methylhexane	Ingestion	Rat	LD50 17,000 mg/kg
2-Methylhexane	Dermal	Rabbit	LD50 3,000 mg/kg
2-Methylhexane	Inhalation-Vapor (4 hours)	Rat	LC50 > 80 mg/l
2-Methylhexane	Ingestion	Rat	LD50 17,000 mg/kg
Citric acid, tributyl ester, acetate	Dermal	Professional judgement	LD50 estimated to be > 5,000 mg/kg
Citric acid, tributyl ester, acetate	Ingestion	Rat	LD50 > 25,000 mg/kg
Dimethylcyclopentane	Ingestion		LD50 estimated to be 300 - 2,000 mg/kg
Methylcyclohexane	Inhalation-Vapor (4 hours)	Mouse	LC50 26 mg/l
Methylcyclohexane	Dermal	Rabbit	LD50 > 86,700 mg/kg
Methylcyclohexane	Ingestion	Rat	LD50 > 3,200 mg/kg
Cyclohexane	Dermal	Rat	LD50 > 2,000 mg/kg
Cyclohexane	Inhalation-Vapor (4 hours)	Rat	LC50 > 32.9 mg/l
Cyclohexane	Ingestion	Rat	LD50 6,200 mg/kg
Maleic Anhydride	Dermal	Rabbit	LD50 2,620 mg/kg
Maleic Anhydride	Ingestion	Rat	LD50 1,030 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Heptane, branched, cyclic and linear	Rabbit	Irritant
Methyl acetate	Rabbit	No significant irritation
3-Methylhexane	Rabbit	Minimal irritation
2-Methylhexane	Rabbit	Minimal irritation
Methylcyclohexane	Rabbit	Minimal irritation
Cyclohexane	Rabbit	Mild irritant
Maleic Anhydride	Human and animal	Corrosive

Serious Eye Damage/Irritation

Name	Species	Value
Heptane, branched, cyclic and linear	Rabbit	Mild irritant
Methyl acetate	Rabbit	Moderate irritant
3-Methylhexane	Rabbit	No significant irritation
2-Methylhexane	Rabbit	No significant irritation
Methylcyclohexane	Rabbit	Mild irritant
Cyclohexane	Rabbit	Mild irritant
Maleic Anhydride	Rabbit	Corrosive

Sensitization:

Skin Sensitization

Name	Species	Value
Heptane, branched, cyclic and linear	Guinea pig	Not classified
Methyl acetate	Human	Not classified
Maleic Anhydride	Multiple animal species	Sensitizing

Respiratory Sensitization

Name	Species	Value
Maleic Anhydride	Human	Sensitizing

Germ Cell Mutagenicity

Name	Route	Value
Heptane, branched, cyclic and linear	In Vitro	Not mutagenic
Methyl acetate	In Vitro	Not mutagenic
Methyl acetate	In vivo	Not mutagenic
Cyclohexane	In Vitro	Not mutagenic
Cyclohexane	In vivo	Some positive data exist, but the data are not sufficient for classification
Maleic Anhydride	In vivo	Not mutagenic
Maleic Anhydride	In Vitro	Some positive data exist, but the data are not sufficient for classification

Carcinogenicity

Name	Route	Species	Value
Methylcyclohexane	Inhalation	Multiple animal species	Not carcinogenic

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
Heptane, branched, cyclic and linear	Not Specified	Not classified for female reproduction	Rat	NOAEL Not available	2 generation
Heptane, branched, cyclic and linear	Not Specified	Not classified for male reproduction	Rat	NOAEL Not available	2 generation
Heptane, branched, cyclic and linear	Not Specified	Not classified for development	Rat	NOAEL Not available	2 generation
Cyclohexane	Inhalation	Not classified for female reproduction	Rat	NOAEL 24 mg/l	2 generation
Cyclohexane	Inhalation	Not classified for male reproduction	Rat	NOAEL 24	2 generation

				mg/l	
Cyclohexane	Inhalation	Not classified for development	Rat	NOAEL 6.9 mg/l	2 generation
Maleic Anhydride	Ingestion	Not classified for female reproduction	Rat	NOAEL 55 mg/kg/day	2 generation
Maleic Anhydride	Ingestion	Not classified for male reproduction	Rat	NOAEL 55 mg/kg/day	2 generation
Maleic Anhydride	Ingestion	Not classified for development	Rat	NOAEL 140 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
Heptane, branched, cyclic and linear	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and animal	NOAEL Not available	
Methyl acetate	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and animal	NOAEL Not available	
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	
3-Methylhexane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Rat	NOAEL 4 mg/l	4 hours
3-Methylhexane	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Not available	NOAEL Not available	not available
3-Methylhexane	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Not available	NOAEL Not available	
2-Methylhexane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Rat	NOAEL 4 mg/l	4 hours
2-Methylhexane	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Not available	NOAEL Not available	not available
2-Methylhexane	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Not available	NOAEL Not available	
Methylcyclohexane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Multiple animal species	NOAEL Not available	
Methylcyclohexane	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	occupational exposure
Methylcyclohexane	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Not available	
Cyclohexane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and animal	NOAEL Not available	
Cyclohexane	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human and animal	NOAEL Not available	
Cyclohexane	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Not available	
Maleic Anhydride	Inhalation	respiratory irritation	May cause respiratory irritation	Human	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 | hematopoietic system | liver | immune system | kidney and/or bladder	Not classified	Rat	NOAEL 6.1 mg/l	28 days
Methylcyclohexane	Inhalation	kidney and/or bladder	Not classified	Rat	NOAEL 1.6 mg/l	12 months
Methylcyclohexane	Inhalation	liver	Not classified	Rabbit	NOAEL 12 mg/l	10 weeks
Cyclohexane	Inhalation	liver	Not classified	Rat	NOAEL 24 mg/l	90 days
Cyclohexane	Inhalation	auditory system	Not classified	Rat	NOAEL 1.7 mg/l	90 days
Cyclohexane	Inhalation	kidney and/or bladder	Not classified	Rabbit	NOAEL 2.7 mg/l	10 weeks
Cyclohexane	Inhalation	hematopoietic system	Not classified	Mouse	NOAEL 24 mg/l	14 weeks
Cyclohexane	Inhalation	peripheral nervous system	Not classified	Rat	NOAEL 8.6 mg/l	30 weeks
Maleic Anhydride	Inhalation	respiratory system	Causes damage to organs through prolonged or repeated exposure	Rat	LOAEL 0.0011 mg/l	6 months
Maleic Anhydride	Inhalation	endocrine system | hematopoietic system | nervous system | kidney and/or bladder | heart | liver | eyes	Not classified	Rat	NOAEL 0.0098 mg/l	6 months
Maleic Anhydride	Ingestion	kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 55 mg/kg/day	80 days
Maleic Anhydride	Ingestion	liver	Some positive data exist, but the data are not sufficient for classification	Rat	LOAEL 250 mg/kg/day	183 days
Maleic Anhydride	Ingestion	heart | nervous system	Not classified	Rat	NOAEL 600 mg/kg/day	183 days
Maleic Anhydride	Ingestion	gastrointestinal tract	Not classified	Rat	NOAEL 150 mg/kg/day	80 days
Maleic Anhydride	Ingestion	hematopoietic system	Not classified	Dog	NOAEL 60 mg/kg/day	90 days
Maleic Anhydride	Ingestion	skin | endocrine system | immune system | eyes | respiratory system	Not classified	Rat	NOAEL 150 mg/kg/day	80 days

Aspiration Hazard

Name	Value
Heptane, branched, cyclic and linear	Aspiration hazard
3-Methylhexane	Aspiration hazard
2-Methylhexane	Aspiration hazard
Methylcyclohexane	Aspiration hazard
Cyclohexane	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 2: Toxic 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
Heptane, branched, cyclic and linear	426260-76-6	Green Algae	Estimated	72 hours	EL50	29 mg/l
Heptane, branched, cyclic and linear	426260-76-6	Water flea	Estimated	48 hours	EL50	3 mg/l
Heptane, branched, cyclic and linear	426260-76-6	Rainbow Trout	Experimental	96 hours	LL50	>13.4 mg/l
Heptane, branched, cyclic and linear	426260-76-6	Green Algae	Estimated	72 hours	NOEL	6.3 mg/l
Heptane, branched, cyclic and linear	426260-76-6	Water flea	Estimated	21 days	NOEL	1 mg/l
Methyl acetate	79-20-9	Bacteria	Experimental	16 hours	EC50	6,000 mg/l
Methyl acetate	79-20-9	Green algae	Experimental	72 hours	EC50	>120 mg/l
Methyl acetate	79-20-9	Water flea	Experimental	48 hours	EC50	1,026.7 mg/l
Methyl acetate	79-20-9	Green algae	Experimental	72 hours	NOEC	120 mg/l
2-Methylhexane	591-76-4	Water flea	Estimated	48 hours	EC50	0.4 mg/l
3-Methylhexane	589-34-4		Data not available or insufficient for classification			N/A
Non-volatile polymeric components	Trade Secret		Data not available or insufficient for classification			N/A
Citric acid, tributyl ester, acetate	77-90-7	Bluegill	Experimental	96 hours	LC50	38 mg/l
Citric acid, tributyl ester, acetate	77-90-7	Green algae	Experimental	72 hours	EC50	74.4 mg/l

Citric acid, tributyl ester, acetate	77-90-7	Water flea	Experimental	48 hours	EC50	7.82 mg/l
Citric acid, tributyl ester, acetate	77-90-7	Green algae	Experimental	72 hours	NOEC	4.65 mg/l
Citric acid, tributyl ester, acetate	77-90-7	Water flea	Experimental	21 days	NOEC	>1.11 mg/l
Dimethylcyclopentane	2532-58-3		Data not available or insufficient for classification			N/A
Cyclohexane	110-82-7	Bacteria	Experimental	24 hours	IC50	97 mg/l
Cyclohexane	110-82-7	Fathead Minnow	Experimental	96 hours	LC50	4.53 mg/l
Cyclohexane	110-82-7	Water flea	Experimental	48 hours	EC50	0.9 mg/l
Maleic Anhydride	108-31-6	Green algae	Estimated	72 hours	EC50	74.4 mg/l
Maleic Anhydride	108-31-6	Water flea	Estimated	48 hours	EC50	93.8 mg/l
Maleic Anhydride	108-31-6	Bacteria	Experimental	18 hours	EC10	44.6 mg/l
Maleic Anhydride	108-31-6	Rainbow Trout	Experimental	96 hours	LC50	75 mg/l
Maleic Anhydride	108-31-6	Green algae	Estimated	72 hours	EC10	11.8 mg/l
Maleic Anhydride	108-31-6	Water flea	Experimental	21 days	NOEC	10 mg/l
Methylcyclohexane	108-87-2	Green Algae	Experimental	72 hours	EC50	0.134 mg/l
Methylcyclohexane	108-87-2	Medaka	Experimental	96 hours	LC50	2.07 mg/l
Methylcyclohexane	108-87-2	Water flea	Experimental	48 hours	EC50	0.326 mg/l
Methylcyclohexane	108-87-2	Green Algae	Experimental	72 hours	NOEC	0.022 mg/l

12.2. Persistence and degradability

Material	CAS No.	Test Type	Duration	Study Type	Test Result	Protocol
Heptane, branched, cyclic and linear	426260-76-6	Estimated Biodegradation	28 days	Biological Oxygen Demand	98 % BOD/ThBOD	OECD 301F - Manometric Respiro
Methyl acetate	79-20-9	Experimental Biodegradation	28 days	Biological Oxygen Demand	70 % weight	OECD 301D - Closed Bottle Test
2-Methylhexane	591-76-4	Estimated Photolysis		Photolytic half-life (in air)	4.3 days (t 1/2)	Non-standard method
2-Methylhexane	591-76-4	Estimated Biodegradation	28 days	Biological Oxygen Demand	93 % BOD/ThBOD	OECD 301C - MITI (I)
3-	589-34-4	Estimated		Photolytic half-	4.2 days (t 1/2)	Non-standard method

Methylhexane		Photolysis		life (in air)		
3-Methylhexane	589-34-4	Estimated Biodegradation	28 days	Biological Oxygen Demand	81 % BOD/ThBOD	OECD 301F - Manometric Respiro
Non-volatile polymeric components	Trade Secret	Data not availbl-insufficient			N/A	
Citric acid, tributyl ester, acetate	77-90-7	Experimental Biodegradation	28 days	Biological Oxygen Demand	48 % weight	Non-standard method
Dimethylcyclopentane	2532-58-3	Estimated Photolysis		Photolytic half-life (in air)	4.36 days (t 1/2)	Non-standard method
Dimethylcyclopentane	2532-58-3	Estimated Biodegradation	28 days	Carbon dioxide evolution	12 %CO2 evolution/THCO2 evolution	Non-standard method
Cyclohexane	110-82-7	Experimental Photolysis		Photolytic half-life (in air)	4.14 days (t 1/2)	Non-standard method
Cyclohexane	110-82-7	Experimental Biodegradation	28 days	Biological Oxygen Demand	77 % BOD/ThBOD	OECD 301F - Manometric Respiro
Maleic Anhydride	108-31-6	Experimental Hydrolysis		Hydrolytic half-life	22 seconds (t 1/2)	Non-standard method
Maleic Anhydride	108-31-6	Estimated Biodegradation	25 days	Carbon dioxide evolution	>90 % weight	OECD 301B - Mod. Sturm or CO2
Methylcyclohexane	108-87-2	Estimated Photolysis		Photolytic half-life (in air)	3.1 days (t 1/2)	Non-standard method
Methylcyclohexane	108-87-2	Experimental Biodegradation	28 days	Biological Oxygen Demand	0 % weight	OECD 301D - Closed Bottle Test

12.3. Bioaccumulative potential

Material	CAS No.	Test Type	Duration	Study Type	Test Result	Protocol
Heptane, branched, cyclic and linear	426260-76-6	Data not available or insufficient for classification	N/A	N/A	N/A	N/A
Methyl acetate	79-20-9	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	0.18	Non-standard method
2-Methylhexane	591-76-4	Estimated Bioconcentration		Bioaccumulation Factor	135	Est: Bioconcentration factor
3-Methylhexane	589-34-4	Estimated Bioconcentration		Bioaccumulation Factor	148	Est: Bioconcentration factor
Non-volatile polymeric components	Trade Secret	Data not available or insufficient for classification	N/A	N/A	N/A	N/A
Citric acid, tributyl ester, acetate	77-90-7	Estimated Bioconcentration		Bioaccumulation Factor	5.1	Est: Bioconcentration factor
Dimethylcyclo	2532-58-3	Estimated		Bioaccumulatio	166	Non-standard method

pentane		Bioconcentration		n Factor		
Cyclohexane	110-82-7	Experimental BCF-Carp	56 days	Bioaccumulation Factor	129	OECD 305E-Bioaccum Fl-thru fis
Maleic Anhydride	108-31-6	Experimental Bioconcentration		Log of Octanol/H2O part. coeff	-2.61	Non-standard method
Methylcyclohexane	108-87-2	Experimental BCF-Carp	56 days	Bioaccumulation Factor	<=321	OECD 305E-Bioaccum Fl-thru fis

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:UN1993
Proper Shipping Name:FLAMMABLE LIQUID, N.O.S.
Technical Name:(HEPTANE, METHYL ACETATE)
Hazard Class/Division:3
Subsidiary Risk: None assigned.
Packing Group:II
Limited Quantity: Yes
Marine Pollutant: Yes
Marine Pollutant Technical Name: None assigned.
Other Dangerous Goods Descriptions:
None assigned.

Air Transport (IATA)

UN Number:UN1993
Proper Shipping Name:FLAMMABLE LIQUID, N.O.S.
Technical Name:(HEPTANE, METHYL ACETATE)
Hazard Class/Division:3
Subsidiary Risk: None assigned.
Packing Group:II
Limited Quantity: None assigned.
Marine Pollutant: Yes
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. This product complies with Measures on Environmental Management of New Chemical Substances. All ingredients are listed on or exempt from on China IECSC 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