Safety Data Sheet

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This Safety Data Sheet has been prepared in accordance with the GHS guidelines & India Hazardous substances (Classification, Labeling & Packaging) Draft Rules 2011.

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	IA-1201-0222-2	IA-1201-0276-8		

1.2. Recommended use and restrictions on use

Recommended use
Adhesion promoter.

1.3. Supplier's details
Address: 3M India Limited, plot-48-51, Electronic city, Hosur road, Bangalore-560100
Telephone: 080-45543000, contact Product EHS team
E Mail: productehs.in@mmm.com
Website: http://solutions.3mindia.co.in

1.4. Emergency telephone number
080-45543000 (Contact hours: 8:00 AM to 5:00 PM)

SECTION 2: Hazard identification

Under MSIHC Rules, information is noted below on flammability, acute toxicity and explosivity relevant to this product. In line with international standards, information on other hazard classes and associated precautionary statements relevant to this product are included as well.

2.1. Classification of the substance or mixture
Flammable Liquid: Category 2.
Acute Toxicity (inhalation): Category 5.
Skin Corrosion/Irritation: Category 2.
Serious Eye Damage/Irritation: Category 2B.
Skin Sensitizer: Category 1A.
Specific Target Organ Toxicity (single exposure): Category 3.
Aspiration Hazard: Category 1.
Acute Aquatic Toxicity: Category 2.

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 vapour.
H315	Causes skin irritation.
H320	Causes eye irritation.
H333	May be harmful if inhaled.
H317	May cause an allergic skin reaction.
H336	May cause drowsiness or dizziness.
H335	May cause respiratory irritation.
H304	May be fatal if swallowed and enters airways.
H401	Toxic to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS

Prevention:

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P280E	Wear protective gloves.

Response:

P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331	Do NOT induce vomiting.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.
P370 + P378	In case of fire: Use a fire fighting agent suitable for flammable liquids such as dry chemical or carbon dioxide to extinguish.

2.3. Other hazards
None known.

SECTION 3: Composition/information on ingredients

This material is a mixture.

Ingredient	CAS Nbr	% 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
Dimethylcyclopentane	2532-58-3	< 2
Citric Acid, Tributyl Ester, Acetate	77-90-7	< 2
Cyclohexane	110-82-7	< 1
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	3388-04-3	< 1
Methylcyclohexane	108-87-2	< 1
Maleic anhydride	108-31-6	< 0.1

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 dykes 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 authorised person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and Safety Data Sheet. Seal the container. Dispose of collected material as soon as possible 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/vapours/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wash contaminated clothing before reuse. Avoid contact with oxidising 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 oxidising 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	CAS Nbr	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
Methylcyclohexane	108-87-2	ACGIH	TWA:100 ppm	
Cyclohexane	110-82-7	ACGIH	TWA:100 ppm	
3-Methylhexane	589-34-4	ACGIH	TWA:400 ppm;STEL:500 ppm	

2-Methylhexane	591-76-4	ACGIH	TWA:400 ppm;STEL:500 ppm	
Methyl Acetate	79-20-9	ACGIH	TWA:200 ppm;STEL:250 ppm	

ACGIH : American Conference of Governmental Industrial Hygienists
AIHA : American Industrial Hygiene Association
CMRG : Chemical Manufacturer's Recommended Guidelines
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/vapours/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:
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

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

Respiratory protection

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

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

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	Mild Solvent
Odour threshold	*No data available.*
pH	4.4

Melting point/Freezing point: NA	*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	Flammable Liquid: Category 2.
Flammable Limits(LEL)	1.2 % [*Details:*Heptane]
Flammable Limits(UEL)	16 % [*Details:*Methyl Acetate]
Vapour 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.*
Kinematic Viscosity	30.5 mm²/sec
Volatile organic compounds (VOC)	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.*

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 polymerisation will not occur.

10.4 Conditions to avoid
Heat.
Sparks and/or flames.

10.5 Incompatible materials
Strong oxidising agents.

10.6 Hazardous decomposition products

Substance	**Condition**
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

SECTION 11: Toxicological information

The information below may not 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 labelling, 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 coloured skin (cyanosis), and may be fatal. Gastrointestinal irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhoea. 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 ATE >20 - =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-	Rat	LC50 > 80 mg/l

	Vapor (4 hours)		
2-Methylhexane	Ingestion	Rat	LD50 17,000 mg/kg
Citric Acid, Tributyl Ester, Acetate	Ingestion	Rat	LD50 > 31,500 mg/kg
Citric Acid, Tributyl Ester, Acetate	Dermal	similar health hazards	LD50 estimated to be > 5,000 mg/kg
Dimethylcyclopentane	Inhalation-Vapor (4 hours)	Rat	LC50 > 25.3 mg/l
Dimethylcyclopentane	Ingestion	Rat	LD50 > 5,000 mg/kg
Dimethylcyclopentane	Dermal	similar health hazards	LD50 estimated to be > 5,000 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
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	Dermal	Rabbit	LD50 6,700 mg/kg
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	Inhalation-Vapor (4 hours)	Rat	LC50 > 7 mg/l
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	Ingestion	Rat	LD50 13,100 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
Citric Acid, Tributyl Ester, Acetate	Rabbit	No significant irritation
Dimethylcyclopentane	Rabbit	No significant irritation
Methylcyclohexane	Rabbit	Minimal irritation
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	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
Citric Acid, Tributyl Ester, Acetate	Rabbit	Mild irritant
Dimethylcyclopentane	Rabbit	Mild irritant
Methylcyclohexane	Rabbit	Mild irritant
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	Rabbit	No significant irritation
Cyclohexane	Rabbit	Mild irritant
Maleic anhydride	Rabbit	Corrosive

Sensitization:

Skin Sensitisation

Name	Species	Value
Heptane, branched, cyclic and linear	Guinea pig	Not classified
Methyl Acetate	Human	Not classified
Citric Acid, Tributyl Ester, Acetate	Guinea pig	Not classified
Dimethylcyclopentane	similar compounds	Not classified
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	similar compounds	Sensitising
Maleic anhydride	Multiple animal species	Sensitising

Respiratory Sensitisation

Name	Species	Value
Maleic anhydride	Human	Sensitising

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
Citric Acid, Tributyl Ester, Acetate	In Vitro	Not mutagenic
Citric Acid, Tributyl Ester, Acetate	In vivo	Not mutagenic
Dimethylcyclopentane	In vivo	Not mutagenic
Dimethylcyclopentane	In Vitro	Some positive data exist, but the data are not sufficient for classification
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	In Vitro	Some positive data exist, but the data are not sufficient for classification
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
Citric Acid, Tributyl Ester, Acetate	Ingestion	Rat	Not carcinogenic
Methylcyclohexane	Inhalation	Multiple animal species	Not carcinogenic
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	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
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	Not classified for development	Rat	NOAEL Not	2 generation

	specified.			available	
Citric Acid, Tributyl Ester, Acetate	Ingestion	Not classified for female reproduction	Rat	NOAEL 1,000 mg/kg/day	2 generation
Citric Acid, Tributyl Ester, Acetate	Ingestion	Not classified for male reproduction	Rat	NOAEL 1,000 mg/kg/day	2 generation
Citric Acid, Tributyl Ester, Acetate	Ingestion	Not classified for development	Rat	NOAEL 100 mg/kg/day	2 generation
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	Ingestion	Not classified for development	Rabbit	NOAEL 0.27 mg/kg/day	during organogenesis
Cyclohexane	Inhalation	Not classified for female reproduction	Rat	NOAEL 24 mg/l	2 generation
Cyclohexane	Inhalation	Not classified for male reproduction	Rat	NOAEL 24 mg/l	2 generation
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	
Dimethylcyclopentane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Rat	NOAEL Not available	
Dimethylcyclopentane	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Rat	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
Citric Acid, Tributyl Ester, Acetate	Ingestion	liver	Not classified	Rat	NOAEL 1,000 mg/kg/day	2 years
Citric Acid, Tributyl Ester, Acetate	Ingestion	immune system | respiratory system	Not classified	Rat	NOAEL 1,000 mg/kg/day	13 weeks
Citric Acid, Tributyl Ester, Acetate	Ingestion	heart | endocrine system | hematopoietic system | nervous system | eyes | kidney and/or bladder	Not classified	Rat	NOAEL 1,000 mg/kg/day	2 years
Dimethylcyclopentane	Inhalation	liver | kidney and/or bladder | heart | skin | endocrine system | gastrointestinal tract | bone, teeth, nails, and/or hair | hematopoietic system | immune system | muscles | nervous system | eyes | respiratory system | vascular system	Not classified	Rat	NOAEL 20.2 mg/l	13 weeks
Dimethylcyclopentane	Ingestion	peripheral nervous system	Not classified	Rat	NOAEL 800 mg/kg/day	8 weeks
Dimethylcyclopentane	Ingestion	kidney and/or bladder	Not classified	Rat	NOAEL 500 mg/kg/day	4 weeks
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	Not classified	Rabbit	NOAEL 2.7	10 weeks

		bladder			mg/l	
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
Dimethylcyclopentane	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 labelling, 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 Nbr	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	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
2-Methylhexane	591-76-4	Water flea	Estimated	48 hours	EC50	0.4 mg/l
3-Methylhexane	589-34-4	N/A	Data not available or insufficient for classification	N/A	N/A	N/A
Non-Volatile Polymeric Components	Trade Secret	N/A	Data not available or insufficient for classification	N/A	N/A	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	ErC50	74.4 mg/l
Citric Acid, Tributyl Ester, Acetate	77-90-7	Mummichog	Experimental	96 hours	LC50	59 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	Fathead minnow	Experimental	7 days	NOEC	0.355 mg/l
Citric Acid, Tributyl Ester, Acetate	77-90-7	Green algae	Experimental	72 hours	NOEC	0.109 mg/l
Citric Acid, Tributyl Ester, Acetate	77-90-7	Water flea	Experimental	21 days	NOEC	>=1.11 mg/l
Citric Acid, Tributyl Ester, Acetate	77-90-7	Activated sludge	Experimental	3 hours	EC10	>1,000 mg/l
Dimethylcyclopentane	2532-58-3	N/A	Data not available or insufficient for classification	N/A	N/A	N/A
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	3388-04-3	Activated sludge	Estimated	30 minutes	IC50	>100 mg/l
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	3388-04-3	Green algae	Estimated	72 hours	EC50	280 mg/l
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	3388-04-3	Rainbow trout	Estimated	96 hours	LC50	180 mg/l
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	3388-04-3	Water flea	Estimated	48 hours	EC50	20 mg/l
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy	3388-04-3	Green algae	Estimated	72 hours	NOEC	1 mg/l

Silane						
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
Cyclohexane	110-82-7	Bacteria	Experimental	24 hours	IC50	97 mg/l
Methylcyclohexane	108-87-2	N/A	Experimental	96 hours	LC50	3.3 mg/l
Methylcyclohexane	108-87-2	Green algae	Experimental	72 hours	ErC50	0.134 mg/l
Methylcyclohexane	108-87-2	Medaka	Experimental	96 hours	LC50	2.07 mg/l
Methylcyclohexane	108-87-2	Striped bass	Experimental	96 hours	LC50	5.8 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
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	Hydrolysis Product	72 hours	ErC50	74.4 mg/l
Maleic anhydride	108-31-6	Water flea	Hydrolysis Product	48 hours	EC50	93.8 mg/l
Maleic anhydride	108-31-6	Water flea	Experimental	21 days	NOEC	10 mg/l
Maleic anhydride	108-31-6	Green algae	Hydrolysis Product	72 hours	ErC10	11.8 mg/l

12.2. Persistence and degradability

Material	CAS Nbr	Test type	Duration	Study Type	Test result	Protocol
Heptane, branched, cyclic and linear	426260-76-6	Estimated Biodegradation	28 days	BOD	98 %BOD/ThOD	OECD 301F - Manometric respirometry
Methyl Acetate	79-20-9	Experimental Biodegradation	28 days	BOD	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)	
2-Methylhexane	591-76-4	Estimated Biodegradation	28 days	BOD	93 %BOD/ThOD	OECD 301C - MITI test (I)
2-Methylhexane	591-76-4	Estimated Photolysis		Photolytic half-life (in air)	4.3 days (t 1/2)	
3-Methylhexane	589-34-4	Estimated Biodegradation	28 days	BOD	81 %BOD/ThOD	OECD 301F - Manometric respirometry
3-Methylhexane	589-34-4	Estimated Photolysis		Photolytic half-life (in air)	4.2 days (t 1/2)	
Non-Volatile Polymeric Components	Trade Secret	Data not available-insufficient	N/A	N/A	N/A	N/A
Citric Acid, Tributyl Ester, Acetate	77-90-7	Experimental Biodegradation	28 days	BOD	16 %BOD/ThOD	OECD 301D - Closed bottle test
Citric Acid, Tributyl Ester, Acetate	77-90-7	Experimental Aquatic Inherent Biodegrad.	28 days	BOD	82 %BOD/ThOD	OECD 302C - Modified MITI (II)
Citric Acid, Tributyl Ester, Acetate	77-90-7	Experimental Soil Metabolism Aerobic	42 days	CO2 evolution	>60 %CO2 evolution/THCO2 evolution	835.3300 Soil Biodeg
Dimethylcyclopentane	2532-58-3	Estimated Biodegradation	28 days	CO2 evolution	12 %CO2 evolution/THCO2 evolution	
Dimethylcyclopentane	2532-58-3	Estimated Photolysis		Photolytic half-life (in air)	4.36 days (t 1/2)	
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	3388-04-3	Estimated Biodegradation	28 days	BOD	28 %BOD/ThOD	OECD 301D - Closed bottle test
Beta-(3,4-Epoxycyclohexyl)E	3388-04-3	Estimated Hydrolysis		Hydrolytic half-life	6.5 hours (t 1/2)	

thyltrimethoxy Silane						
Cyclohexane	110-82-7	Experimental Biodegradation	28 days	BOD	77 %BOD/ThOD	OECD 301F - Manometric respirometry
Cyclohexane	110-82-7	Experimental Photolysis		Photolytic half-life (in air)	4.3 days (t 1/2)	
Methylcyclohexane	108-87-2	Experimental Biodegradation	28 days	BOD	0 %BOD/ThOD	OECD 301D - Closed bottle test
Methylcyclohexane	108-87-2	Experimental Photolysis		Photolytic half-life (in air)	3.0 days (t 1/2)	
Maleic anhydride	108-31-6	Hydrolysis product	25 days	CO2 evolution	>90 %CO2 evolution/THCO2 evolution	OECD 301B - Modified sturm or CO2
Maleic anhydride	108-31-6	Experimental Hydrolysis		Hydrolytic half-life	0.37 minutes (t 1/2)	

12.3 : Bioaccumulative potential

Material	CAS Nbr	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 Kow	0.18	
2-Methylhexane	591-76-4	Estimated Bioconcentration		Bioaccumulation factor	135	
3-Methylhexane	589-34-4	Estimated Bioconcentration		Bioaccumulation factor	148	
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	Modeled Bioconcentration		Bioaccumulation factor	5.1	Catalogic™
Citric Acid, Tributyl Ester, Acetate	77-90-7	Experimental Bioconcentration		Log Kow	4.86	OECD 117 log Kow HPLC method
Dimethylcyclopentane	2532-58-3	Estimated Bioconcentration		Bioaccumulation factor	166	
Beta-(3,4-Epoxycyclohexyl)Ethyltrimethoxy Silane	3388-04-3	Estimated Bioconcentration		Bioaccumulation factor	2.3	
Cyclohexane	110-82-7	Experimental BCF - Fish	56 days	Bioaccumulation factor	129	OECD305-Bioconcentration
Cyclohexane	110-82-7	Experimental Bioconcentration		Log Kow	3.44	
Methylcyclohexane	108-87-2	Experimental BCF - Fish	56 days	Bioaccumulation factor	<=321	OECD305-Bioconcentration
Methylcyclohexane	108-87-2	Experimental Bioconcentration		Log Kow	3.88	
Maleic anhydride	108-31-6	Experimental Bioconcentration		Log Kow	-2.61	OECD 107 log Kow shke flsk mtd

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

Incinerate in a permitted waste incineration facility. As a disposal alternative, utilize an acceptable permitted waste disposal facility. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

SECTION 14: Transport Information

Air Transport (IATA)Regulations

UN No UN1993
Proper Shipping Name FLAMMABLE LIQUID, N.O.S. (NAPHTHA AND METHYL ACETATE)
Hazard Classs/Division 3
Subsidiary Risk Not applicable
Packing Group: II

Marine Transport (IMDG)
UN No UN1993
Proper Shipping Name FLAMMABLE LIQUID, N.O.S. (NAPHTHA AND METHYL ACETATE)
Hazard Classs/Division 3
Subsidiary Risk Not applicable
Packing Group: II
Environmental Hazards: Not applicable

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.

Applicable Environmental, Health and Safety Regulations
The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989
Hazardous Waste(Management , Handling & Transboundary) Rules, 2008
Hazardous Chemicals (Classification, Packaging and Labelling Draft Rules), 2011
Central Motor Vehicle Rules, 1989

The following ingredients are listed as hazardous on Part II of Schedule I of the India Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) rules
Cyclohexane
Maleic anhydride

The following ingredients are classified as hazardous based on the criteria listed under Part I of Schedule I of the India Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) rules:
Product is classified as very highly flammable liquid

SECTION 16: Other information

NFPA Hazard Classification
Health: 2 **Flammability:** 3 **Instability:** 0 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar

emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

Revision information:
Section 1: Product identification numbers information was modified.
Label: GHS Classification information was modified.
Label: GHS Precautionary - Disposal information was deleted.
Label: GHS Precautionary - Prevention information was modified.
Label: GHS Precautionary - Response information was modified.
Label: Signal Word information was modified.
Label: Symbol information was modified.
Section 2: Ingredient table information was modified.
Section 8: Eye/face protection information information was modified.
Section 8: Occupational exposure limit table information was modified.
Section 9: Flammability (solid, gas) information information was deleted.
Section 09: Flammability information information was added.
Section 09: Kinematic Viscosity information information was added.
Section 09: Nanoparticle information was deleted.
Section 09: Odor information was modified.
Section 09: Particle Characteristics N/A information was added.
Section 09: Viscosity information was deleted.
Section 11: Acute Toxicity table information was modified.
Section 11: Aspiration Hazard Table information was modified.
Section 11: Carcinogenicity Table information was added.
Section 11: Carcinogenicity text information was deleted.
Section 11: Germ Cell Mutagenicity Table information was modified.
Section 11: Reproductive Toxicity Table information was modified.
Section 11: Serious Eye Damage/Irritation Table information was modified.
Section 11: Skin Corrosion/Irritation Table information was modified.
Section 11: Skin Sensitization Table information was modified.
Section 11: Target Organs - Repeated Table information was modified.
Section 11: Target Organs - Single Table information was modified.
Section 12: Component ecotoxicity information information was modified.
Section 12: Persistence and Degradability information information was modified.
Section 12:Bioccumulative potential information information was modified.
Section 15: MSIHC Ingredients information was modified.

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 India, you are responsible to comply with all applicable regulatory requirements, including, but not limited to, product registrations/notifications, substance volume tracking, and potential substance registration/notification.

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