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™ Novec™ 1720 Electronic Grade Coating

Product Identification Numbers
98-0212-3193-5 98-0212-3238-8 98-0212-3694-2 HB-0045-4420-9

1.2. Recommended use and restrictions on use

Recommended use
For Industrial Use Only. Not Intended for Use as a Medical Device or Drug., Coating applications in electronic industry

Restrictions on use
3M Electronics Markets Materials Division (EMMD) will not knowingly sample, support, or sell its products for incorporation in medical and pharmaceutical products and applications in which the 3M product will be temporarily or permanently implanted into humans or animals. The customer is responsible for evaluating and determining that a 3M EMMD product is suitable and appropriate for its particular use and intended application. The conditions of evaluation, selection, and use of a 3M product can vary widely and affect the use and intended application of a 3M product. Because many of these conditions are uniquely within the user's knowledge and control, it is essential that the user evaluate and determine whether the 3M product is suitable and appropriate for a particular use and intended application, and complies with all local applicable laws, regulations, standards, and guidance.

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
Not classified as hazardous according to Occupational Safety and Health (Chemical Classification, Labelling and Safety Data Sheets) Regulations 2013.

2.2. Label elements
Signal word
Not applicable.

Symbols
Not applicable.

Pictograms
Not applicable.

2.3. Other hazards
None known

SECTION 3: Composition/information on ingredients

This material is a mixture.

Ingredient	C.A.S. No.	% by Wt
Methyl Nonafluorobutyl Ether	163702-07-6	20 - 80
Methyl Nonafluoroisobutyl Ether	163702-08-7	20 - 80
Fluoropolymer	Trade Secret	< 0.2

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
No need for first aid is anticipated.

Skin Contact:
Wash with soap and water. 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:
No need for first aid is anticipated.

4.2. Most important symptoms and effects, both acute and delayed
See Section 11.1. Information on toxicological effects.

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

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media
Material will not burn. Use a fire fighting agent suitable for the surrounding fire.

5.2. Special hazards arising from the substance or mixture
Exposure to extreme heat can give rise to thermal decomposition.

5.3. Special protective actions for fire-fighters
When fire fighting conditions are severe and total thermal decomposition of the product is possible, 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. 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. 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. 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. Place in a closed container approved for transportation by appropriate authorities. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and SDS. Seal the container. Dispose of collected material as soon as possible in accordance with applicable local/regional/national/international regulations.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Do not breathe thermal decomposition products. Avoid skin contact with hot material. For industrial or professional use only. Store work clothes separately from other clothing, food and tobacco products. Avoid release to the environment. No smoking: Smoking while using this product can result in contamination of the tobacco and/or smoke and lead to the formation of hazardous decomposition products.

7.2. Conditions for safe storage including any incompatibilities
Store in a well-ventilated place. Keep container tightly closed. Store away from heat. Store away from strong bases.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits
No occupational exposure limit values exist for any of the components listed in Section 3 of this SDS.

8.2. Exposure controls

8.2.1. Engineering controls
Provide appropriate local exhaust when product is heated. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:
Safety Glasses with side shields

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.
Gloves made from the following material(s) are recommended: Nitrile Rubber

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 – Nitrile

Respiratory protection

During heating:

Use a positive pressure supplied-air respirator if there is a potential for over exposure from an uncontrolled release, exposure levels are not known, or under any other circumstances where air-purifying respirators may not provide adequate protection.

Thermal hazards
Wear heat insulating gloves when handling hot material to prevent thermal burns.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Liquid
Specific Physical Form:	Liquid
Appearance/Odor	Clear, colorless, liquid. Slight ethereal odor.
Odor threshold	*No Data Available*
pH	*Not Applicable*
Melting point/Freezing point	-135 ºC
Boiling point/Initial boiling point/Boiling range	61 ºC [@ 101,324.72 Pa]
Flash Point	No flash point
Evaporation rate	49 [*Ref Std:*BUOAC=1]
Flammability (solid, gas)	Not Applicable
Flammable Limits(LEL)	None detected [*Details:*NONE acc to ASTM E681-94, @100C]
Flammable Limits(UEL)	None detected [*Details:*NONE acc to ASTM E681-94, @100C]
Vapor Pressure	26,931 Pa [@ 25 ºC]
Vapor Density	8.6 [*Ref Std:*AIR=1]
Density	1.5 g/ml
Relative Density	1.5 [*Ref Std:*WATER=1]
Water solubility	< 12 ppm
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	405 ºC [*Details:*(ASTM E659-84)]
Decomposition temperature	*No Data Available*
Viscosity	0.6 mPa-s [@ 23 ºC]
Molecular weight	*No Data Available*
Volatile Organic Compounds	[*Details:*Exempt]
Percent volatile	> 99 % weight
VOC Less H2O & Exempt Solvents	[*Details:*Exempt]

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
Not determined

10.5. Incompatible materials
Strong bases

10.6. Hazardous decomposition products

Substance	Condition
Hydrogen Fluoride	At Elevated Temperatures - extreme conditions of heat
Perfluoroisobutylene (PFIB)	At Elevated Temperatures - extreme conditions of heat

If the product is exposed to extreme condition of heat from misuse or equipment failure, toxic decomposition products that include hydrogen fluoride and perfluoroisobutylene can occur.

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:
Vapors from heated material may cause irritation of the respiratory system. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Skin Contact:
Contact with the skin during product use is not expected to result in significant irritation.

Eye Contact:
Contact with the eyes during product use is not expected to result in significant irritation.

Ingestion:

No known health effects.

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	Ingestion		No data available; calculated ATE >5,000 mg/kg
Methyl Nonafluoroisobutyl Ether	Dermal		LD50 estimated to be > 5,000 mg/kg
Methyl Nonafluoroisobutyl Ether	Inhalation-Vapor (4 hours)	Rat	LC50 > 1,000 mg/l
Methyl Nonafluoroisobutyl Ether	Ingestion	Rat	LD50 > 5,000 mg/kg
Methyl Nonafluorobutyl Ether	Dermal		LD50 estimated to be > 5,000 mg/kg
Methyl Nonafluorobutyl Ether	Inhalation-Vapor (4 hours)	Rat	LC50 > 1,000 mg/l
Methyl Nonafluorobutyl Ether	Ingestion	Rat	LD50 > 5,000 mg/kg
Fluoropolymer	Ingestion	Rat	LD50 > 1,000 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Methyl Nonafluoroisobutyl Ether	Rabbit	No significant irritation
Methyl Nonafluorobutyl Ether	Rabbit	No significant irritation
Fluoropolymer	Rabbit	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value
Methyl Nonafluoroisobutyl Ether	Rabbit	No significant irritation
Methyl Nonafluorobutyl Ether	Rabbit	No significant irritation
Fluoropolymer	Rabbit	Mild irritant

Skin Sensitization

Name	Species	Value
Methyl Nonafluoroisobutyl Ether	Guinea pig	Not classified
Methyl Nonafluorobutyl Ether	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
Methyl Nonafluoroisobutyl Ether	In Vitro	Not mutagenic
Methyl Nonafluoroisobutyl Ether	In vivo	Not mutagenic
Methyl Nonafluorobutyl Ether	In Vitro	Not mutagenic
Methyl Nonafluorobutyl Ether	In vivo	Not mutagenic
Fluoropolymer	In Vitro	Not mutagenic

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

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
Methyl Nonafluoroisobutyl Ether	Inhalation	Not classified for female reproduction	Rat	NOAEL 129 mg/l	1 generation
Methyl Nonafluoroisobutyl Ether	Inhalation	Not classified for male reproduction	Rat	NOAEL 129 mg/l	1 generation
Methyl Nonafluoroisobutyl Ether	Inhalation	Not classified for development	Rat	NOAEL 307 mg/l	during gestation
Methyl Nonafluorobutyl Ether	Inhalation	Not classified for female reproduction	Rat	NOAEL 129 mg/l	1 generation
Methyl Nonafluorobutyl Ether	Inhalation	Not classified for male reproduction	Rat	NOAEL 129 mg/l	1 generation
Methyl Nonafluorobutyl Ether	Inhalation	Not classified for development	Rat	NOAEL 307 mg/l	during gestation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Methyl Nonafluoroisobutyl Ether	Inhalation	nervous system	Not classified	Dog	LOAEL 913 mg/l	10 minutes
Methyl Nonafluoroisobutyl Ether	Inhalation	cardiac sensitization	Not classified	Dog	NOAEL 913 mg/l	10 minutes
Methyl Nonafluorobutyl Ether	Inhalation	nervous system	Not classified	Dog	LOAEL 913 mg/l	10 minutes
Methyl Nonafluorobutyl Ether	Inhalation	cardiac sensitization	Not classified	Dog	NOAEL 913 mg/l	10 minutes

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Methyl Nonafluoroisobutyl Ether	Inhalation	liver	Not classified	Rat	NOAEL 155 mg/l	13 weeks
Methyl Nonafluoroisobutyl Ether	Inhalation	bone, teeth, nails, and/or hair	Not classified	Rat	NOAEL 129 mg/l	11 weeks
Methyl Nonafluoroisobutyl Ether	Inhalation	heart | skin | endocrine system | gastrointestinal tract | hematopoietic system | immune system | muscles | nervous system | eyes | kidney and/or bladder | respiratory system	Not classified	Rat	NOAEL 155 mg/l	13 weeks
Methyl Nonafluoroisobutyl Ether	Ingestion	endocrine system | liver | heart | hematopoietic system | immune system | nervous system | eyes | kidney and/or bladder | respiratory system	Not classified	Rat	NOAEL 1,000 mg/kg/day	28 days
Methyl Nonafluorobutyl Ether	Inhalation	liver	Not classified	Rat	NOAEL 155 mg/l	13 weeks
Methyl Nonafluorobutyl Ether	Inhalation	bone, teeth, nails, and/or hair	Not classified	Rat	NOAEL 129 mg/l	11 weeks
Methyl Nonafluorobutyl Ether	Inhalation	heart | skin | endocrine system | gastrointestinal tract | hematopoietic system | immune	Not classified	Rat	NOAEL 155 mg/l	13 weeks

		system | muscles | nervous system | eyes | kidney and/or bladder | respiratory system				
Methyl Nonafluorobutyl Ether	Ingestion	endocrine system | liver | heart | hematopoietic system | immune system | nervous system | eyes | kidney and/or bladder | respiratory system	Not classified	Rat	NOAEL 1,000 mg/kg/day	28 days

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

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

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

12.1. Toxicity

Acute aquatic hazard:
Not acutely toxic to aquatic life by GHS criteria.

Chronic aquatic hazard:
Not chronically toxic to aquatic life by GHS criteria.

No product test data available

Material	Cas #	Organism	Type	Exposure	Test Endpoint	Test Result
Methyl Nonafluorobutyl Ether	163702-07-6	Fathead Minnow	Endpoint not reached	96 hours	Lethal Concentration 50%	>100 mg/l
Methyl Nonafluorobutyl Ether	163702-07-6	Green Algae	Estimated	72 hours	Effect Concentration 50%	>100 mg/l
Methyl Nonafluorobutyl Ether	163702-07-6	Water flea	Estimated	48 hours	Effect Concentration 50%	>100 mg/l
Methyl Nonafluorobutyl Ether	163702-07-6	Green Algae	Estimated	72 hours	No obs Effect Conc	>100 mg/l
Methyl Nonafluoroisobutyl Ether	163702-08-7	Fathead Minnow	Endpoint not reached	96 hours	Lethal Concentration 50%	>100 mg/l
Methyl Nonafluoroisobutyl Ether	163702-08-7	Green Algae	Estimated	72 hours	Effect Concentration 50%	>100 mg/l

Methyl Nonafluoroisobutyl Ether	163702-08-7	Water flea	Estimated	48 hours	Effect Concentration 50%	>100 mg/l
Methyl Nonafluoroisobutyl Ether	163702-08-7	Green Algae	Estimated	72 hours	No obs Effect Conc	>100 mg/l
Fluoropolymer	Trade Secret		Data not available or insufficient for classification			

12.2. Persistence and degradability

Material	CAS No.	Test Type	Duration	Study Type	Test Result	Protocol
Methyl Nonafluorobutyl Ether	163702-07-6	Estimated Biodegradation	28 days	Biological Oxygen Demand	22 % BOD/ThBOD	OECD 301D - Closed Bottle Test
Methyl Nonafluoroisobutyl Ether	163702-08-7	Estimated Photolysis		Half-life (t 1/2)	2.9 years (t 1/2)	Other methods
Methyl Nonafluoroisobutyl Ether	163702-08-7	Estimated Biodegradation	28 days	Biological Oxygen Demand	22 % BOD/ThBOD	OECD 301D - Closed Bottle Test
Fluoropolymer	Trade Secret	Data not availbl-insufficient			N/A	

12.3. Bioaccumulative potential

Material	CAS No.	Test Type	Duration	Study Type	Test Result	Protocol
Methyl Nonafluorobutyl Ether	163702-07-6	Estimated Photolysis		Half-life (t 1/2)	2.9 years (t 1/2)	Other methods
Methyl Nonafluorobutyl Ether	163702-07-6	Estimated Bioconcentration		Log of Octanol/H2O part. coeff	4.0	Other methods
Methyl Nonafluoroisobutyl Ether	163702-08-7	Estimated Bioconcentration		Log of Octanol/H2O part. coeff	4.0	Other methods
Fluoropolymer	Trade Secret	Data not available or insufficient for classification	N/A	N/A	N/A	N/A

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

Not hazardous for transportation.

Marine Transport (IMDG)

UN Number: None assigned.
Proper Shipping Name: None assigned.
Technical Name: None assigned.
Hazard Class/Division: None assigned.
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: None assigned.
Proper Shipping Name: None assigned.
Technical Name: None assigned.
Hazard Class/Division: None assigned.
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 Philippines RA 6969 requirements. Certain restrictions may apply. Contact the selling division for additional 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. 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