Safety Data Sheet

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This Safety Data Sheet has been prepared in accordance with the REACH Regulation (EC) 1907/2006 and its modifications.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

3M™ Novec™ 2702 Electronic Grade Coating

Product Identification Numbers

98-0212-3529-0

7100003815

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses

For industrial use only. Not intended for use as a medical device or drug.

Restrictions on Use

One or more components in this material are approved for specific commercial use(s) under a U.S. EPA low volume exemption. Approved commercial use(s): Protective coating. Refer to Section 15 for additional information.

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. Details of the supplier of the safety data sheet

Address: 3M United Kingdom PLC, 3M Centre, Cain Road, Bracknell, Berkshire, RG12 8HT.
Telephone: +44 (0)1344 858 000
E Mail: tox.uk@mmm.com
Website: www.3M.com/uk

1.4. Emergency telephone number

+44 (0)1344 858 000

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture
CLP REGULATION (EC) No 1272/2008

CLASSIFICATION:
Hazardous to the Aquatic Environment (Chronic), Category 4 - Aquatic Chronic 4; H413

For full text of H phrases, see Section 16.

2.2. Label elements
CLP REGULATION (EC) No 1272/2008

HAZARD STATEMENTS:

H413	May cause long lasting harmful effects to aquatic life.

PRECAUTIONARY STATEMENTS

Disposal:

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

2% of the mixture consists of components of unknown acute oral toxicity.

Contains 2% of components with unknown hazards to the aquatic environment.

2.3. Other hazards

None known.

SECTION 3: Composition/information on ingredients

Ingredient	CAS Nbr	EU Inventory	% by Wt	Classification
Ethyl Nonafluorobutyl Ether (REACH Reg. No.:01-0000017174-74)	163702-05-4	ELINCS 425-340-0	30 - 70	Aquatic Chronic 4, H413 (Self Classified)
Ethyl Nonafluoroisobutyl Ether (REACH Reg. No.:01-0000017174-74)	163702-06-5	ELINCS 425-340-0	30 - 70	Aquatic Chronic 4, H413 (Self Classified)
Fluorinated Methacrylate Polymer	Trade Secret		<= 2	Substance not classified as hazardous

Please see section 16 for the full text of any H statements referred to in this section

For information on ingredient occupational exposure limits or PBT or vPvB status, see sections 8 and 12 of this SDS

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation
Remove person to fresh air. If you are concerned, get medical advice.

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
Rinse mouth. If you feel unwell, get medical attention.

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. 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.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide.	During combustion.
Carbon dioxide.	During combustion.
Toxic vapour, gas, particulate.	During combustion.

5.3. Advice 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,tunic and trousers (leggings),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 vapours, 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.

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 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.

6.4. Reference to other sections
Refer to Section 8 and Section 13 for more information

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Avoid inhalation of thermal decomposition products. For industrial or professional use only. Do not use in a confined area with minimal air exchange. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.

7.2. Conditions for safe storage including any incompatibilities
Keep container tightly closed to prevent contamination with water or air. If contamination is suspected, do not reseal container. Store away from acids.

7.3. Specific end use(s)
See information in Section 7.1 and 7.2 for handling and storage recommendations. See Section 8 for exposure controls and personal protection recommendations.

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
Ethyl Nonafluorobutyl Ether	163702-05-4	Manufacturer determined	TWA(as total isomers):200 ppm	
Ethyl Nonafluoroisobutyl Ether	163702-06-5	Manufacturer determined	TWA(as total isomers):200 ppm	

UK HSC : UK Health and Safety Commission
TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

Biological limit values
No biological limit values exist for any of the components listed in Section 3 of this safety data sheet.

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/vapours/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection
None required.

Skin/hand protection
No chemical protective gloves are required.

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.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Liquid.
Specific Physical Form:	Liquid.
Appearance/Odour	Clear, colourless to light coloured liquid. No odour
Odour threshold	*No data available.*
pH	*Not applicable.*
Boiling point/boiling range	76 ºC
Melting point	*Not applicable.*
Flammability (solid, gas)	Not applicable.
Explosive properties	Not classified
Oxidising properties	Not classified
Flash point	No flash point
Autoignition temperature	375 ºC [*Details:*ASTM E659-78 Method]
Flammable Limits(LEL)	210 g/m³ [*Details:*ASTM E681-94 Method]
Flammable Limits(UEL)	1,070 g/m³ [*Details:*ASTM E681-94 Method]
Vapour pressure	14,532.1 Pa [@ 25 ºC]
Relative density	1.43 [*Ref Std:*WATER=1]
Water solubility	*No data available.*
Solubility- non-water	*No data available.*
Partition coefficient: n-octanol/water	*No data available.*
Evaporation rate	33 [*Ref Std:*BUOAC=1]
Vapour density	approximately 9.1 [*Ref Std:*AIR=1]
Decomposition temperature	*No data available.*
Viscosity	*No data available.*
Density	1.43 g/ml

9.2. Other information

EU Volatile Organic Compounds	1,401.4 g/l
Molecular weight	*No data available.*
Percent volatile	98 %

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
Not determined

10.5 Incompatible materials
Reaction with water, alcohols, and amines is not hazardous if container can vent to the atmosphere to prevent pressure buildup.
Strong acids.
Water

10.6 Hazardous decomposition products

Substance	Condition
Hydrogen Fluoride	At elevated temperatures. - extreme conditions of heat

Refer to section 5.2 for hazardous decomposition products during combustion.

Extreme heat arising from situations such as misuse or equipment failure can generate hydrogen fluoride as a decomposition product.

SECTION 11: Toxicological information

The information below may not agree with the EU material classification in Section 2 and/or the ingredient classifications in Section 3 if specific ingredient classifications are mandated by a competent authority. In addition, statements and data presented in Section 11 are based on UN GHS calculation rules and classifications derived from 3M assessments.

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
No known health effects.

Skin contact
May be harmful in contact with skin. 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
May be harmful if swallowed.

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 ATE2,000 - 5,000 mg/kg
Overall product	Ingestion		No data available; calculated ATE2,000 - 5,000 mg/kg
Ethyl Nonafluorobutyl Ether	Dermal		LD50 estimated to be 2,000 - 5,000 mg/kg
Ethyl Nonafluoroisobutyl Ether	Dermal		LD50 estimated to be 2,000 - 5,000 mg/kg
Ethyl Nonafluorobutyl Ether	Inhalation-Vapour (4 hours)	Rat	LC50 > 989 mg/l
Ethyl Nonafluorobutyl Ether	Ingestion	Rat	LD50 > 2,000 mg/kg
Ethyl Nonafluoroisobutyl Ether	Inhalation-Vapour (4 hours)	Rat	LC50 > 989 mg/l
Ethyl Nonafluoroisobutyl Ether	Ingestion	Rat	LD50 > 2,000 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Ethyl Nonafluorobutyl Ether	Rabbit	No significant irritation
Ethyl Nonafluoroisobutyl Ether	Rabbit	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value
Ethyl Nonafluorobutyl Ether	Rabbit	No significant irritation
Ethyl Nonafluoroisobutyl Ether	Rabbit	No significant irritation

Skin Sensitisation

Name	Species	Value
Ethyl Nonafluorobutyl Ether	Guinea pig	Not sensitising
Ethyl Nonafluoroisobutyl Ether	Guinea pig	Not sensitising

Respiratory Sensitisation

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

Germ Cell Mutagenicity

Name	Route	Value
Ethyl Nonafluorobutyl Ether	In Vitro	Not mutagenic
Ethyl Nonafluorobutyl Ether	In vivo	Not mutagenic
Ethyl Nonafluoroisobutyl Ether	In Vitro	Not mutagenic
Ethyl Nonafluoroisobutyl Ether	In vivo	Not mutagenic

Carcinogenicity

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

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test result	Exposure Duration
Ethyl Nonafluorobutyl Ether	Inhalation	Some positive developmental data exist, but the data are not sufficient for classification	Rat	NOAEL 260 mg/l	during gestation
Ethyl Nonafluoroisobutyl Ether	Inhalation	Some positive developmental data exist, but the data are not sufficient for classification	Rat	NOAEL 260 mg/l	during gestation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
Ethyl Nonafluorobutyl Ether	Inhalation	cardiac sensitisation	Some positive data exist, but the data are not sufficient for classification	Dog	NOAEL 204 mg/l	17 minutes
Ethyl Nonafluorobutyl Ether	Inhalation	respiratory irritation	All data are negative	Rat	NOAEL 989 mg/l	4 hours
Ethyl Nonafluoroisobutyl Ether	Inhalation	cardiac sensitisation	Some positive data exist, but the data are not sufficient for classification	Dog	NOAEL 204 mg/l	17 minutes
Ethyl Nonafluoroisobutyl	Inhalation	respiratory irritation	All data are negative	Rat	NOAEL 989	4 hours

Ether					mg/l	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
Ethyl Nonafluorobutyl Ether	Inhalation	liver | kidney and/or bladder | respiratory system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 263.4 mg/l	4 weeks
Ethyl Nonafluorobutyl Ether	Inhalation	heart | endocrine system | bone marrow | hematopoietic system | immune system | nervous system	All data are negative	Rat	NOAEL 263.4 mg/l	4 weeks
Ethyl Nonafluorobutyl Ether	Ingestion	blood | liver | kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 1,000 mg/kg/day	28 days
Ethyl Nonafluorobutyl Ether	Ingestion	heart | endocrine system | bone marrow | hematopoietic system | immune system | nervous system | respiratory system	All data are negative	Rat	NOAEL 1,000 mg/kg/day	28 days
Ethyl Nonafluoroisobutyl Ether	Inhalation	liver | kidney and/or bladder | respiratory system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 263.4 mg/l	4 weeks
Ethyl Nonafluoroisobutyl Ether	Inhalation	heart | endocrine system | bone marrow | hematopoietic system | immune system | nervous system	All data are negative	Rat	NOAEL 263.4 mg/l	4 weeks
Ethyl Nonafluoroisobutyl Ether	Ingestion	blood | liver | kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 1,000 mg/kg/day	28 days
Ethyl Nonafluoroisobutyl Ether	Ingestion	heart | endocrine system | bone marrow | hematopoietic system | immune system | nervous system | respiratory system	All data are negative	Rat	NOAEL 1,000 mg/kg/day	28 days

Aspiration Hazard
For the component/components, either no data is currently available or the data is 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 agree with the EU material classification in Section 2 and/or the ingredient classifications in Section 3 if specific ingredient classifications are mandated by a competent authority. In addition, statements and data presented in Section 12 are based on UN GHS calculation rules and classifications derived from 3M assessments.

12.1. Toxicity

No product test data available.

Material	CAS Nbr	Organism	Type	Exposure	Test endpoint	Test result
Fluorinated Methacrylate Polymer	Trade Secret		Data not available or insufficient for classification			
Ethyl Nonafluoroisobutyl Ether	163702-06-5	Green Algae	Experimental	96 hours	EC50	>100 mg/l
Ethyl Nonafluoroisobutyl Ether	163702-06-5	Fathead minnow	Experimental	96 hours	LC50	>100 mg/l
Ethyl Nonafluoroisobutyl Ether	163702-06-5	Water flea	Experimental	48 hours	EC50	>100 mg/l
Ethyl Nonafluorobutyl Ether	163702-05-4	Green Algae	Experimental	96 hours	EC50	>100 mg/l
Ethyl Nonafluorobutyl Ether	163702-05-4	Fathead minnow	Experimental	96 hours	LC50	>100 mg/l
Ethyl Nonafluorobutyl Ether	163702-05-4	Water flea	Experimental	48 hours	EC50	>100 mg/l

12.2. Persistence and degradability

Material	CAS Nbr	Test type	Duration	Study Type	Test result	Protocol
Ethyl Nonafluorobutyl Ether	163702-05-4	Estimated Hydrolysis		Hydrolytic half-life	648 days (t 1/2)	Other methods
Ethyl Nonafluoroisobutyl Ether	163702-06-5	Estimated Hydrolysis		Hydrolytic half-life	648 days (t 1/2)	Other methods
Fluorinated Methacrylate Polymer	Trade Secret	Data not available or insufficient for classification	N/A	N/A	N/A	N/A
Ethyl Nonafluoroisobutyl Ether	163702-06-5	Experimental Biodegradation	28 days	BOD	0 % weight	OECD 301D - Closed bottle test
Ethyl Nonafluorobutyl Ether	163702-05-4	Experimental Biodegradation	28 days	BOD	0 % weight	OECD 301D - Closed bottle test

12.3 : Bioaccumulative potential

Material	CAS Nbr	Test type	Duration	Study Type	Test result	Protocol
Fluorinated Methacrylate Polymer	Trade Secret	Data not available or insufficient for classification	N/A	N/A	N/A	N/A
Ethyl Nonafluoroisobutyl Ether	163702-06-5	Experimental BCF-Carp	56 days	Bioaccumulation factor	919	OECD 305E - Bioaccumulation flow-through fish test

Ethyl Nonafluorobutyl Ether	163702-05-4	Experimental BCF-Carp	56 days	Bioaccumulation factor	919	OECD 305E - Bioaccumulation flow-through fish test

12.4. Mobility in soil
Please contact manufacturer for more details

12.5. Results of the PBT and vPvB assessment

No information available at this time, contact manufacturer for more details

12.6. Other adverse effects

Material	CAS Nbr	Ozone Depletion Potential	Global Warming Potential
Ethyl nonafluorobutyl ether	163702-05-4	0	
Ethyl nonafluoroisobutyl ether	163702-06-5	0	
fluorinated methacrylate polymer	Trade Secret	0	

SECTION 13: Disposal considerations

13.1 Waste treatment methods
See Section 11.1 Information on toxicological effects

Dispose of waste product in a permitted industrial waste facility. Combustion products will include HF. Facility must be capable of handling halogenated materials. 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.

The coding of a waste stream is based on the application of the product by the consumer. Since this is out of the control of 3M, no waste code(s) for products after use will be provided. Please refer to the European Waste Code (EWC - 2000/532/EC and amendments) to assign the correct waste code to your waste stream. Ensure national and/or regional regulations are complied with and always use a licensed waste contractor.

EU waste code (product as sold)
070703* Organic halogenated solvents, washing liquids and mother liquors

SECTION 14: Transportation information

98-0212-3529-0

Not hazardous for transportation

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.

15.2. Chemical Safety Assessment
Not applicable

SECTION 16: Other information

List of relevant H statements

H413	May cause long lasting harmful effects to aquatic life.

Revision information:

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.

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 United Kingdom MSDSs are available at www.3M.com/uk