Safety Data Sheet

Document Group:	31-7491-9	**Version Number:**	2.00
Issue Date:	06/12/15	**Supercedes Date:**	12/09/14

SECTION 1: Identification

1.1. Product identifier
3M™ FC-501 Fluorochemical Alcohol

Product Identification Numbers
98-0213-2792-3, 98-0213-2793-1

1.2. Recommended use and restrictions on use

Recommended use
Additive

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Advanced Materials Division
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

1.4. Emergency telephone number
1-800-364-3577 or (651) 737-6501 (24 hours)

SECTION 2: Hazard identification

2.1. Hazard classification
Reproductive Toxicity: Category 2.
Specific Target Organ Toxicity (single exposure): Category 2.
Specific Target Organ Toxicity (repeated exposure): Category 2.

2.2. Label elements
Signal word
Warning

Symbols
Health Hazard |

Pictograms

Hazard Statements
Suspected of damaging fertility or the unborn child.

May cause damage to organs:
nervous system |

May cause damage to organs through prolonged or repeated exposure:
liver |

Precautionary Statements

Prevention:
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust/fume/gas/mist/vapors/spray.
Wear protective gloves.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.

Response:
IF exposed or concerned: Call a POISON CENTER or doctor/physician.

Storage:
Store locked up.

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

2.3. Hazards not otherwise classified
None.

5% of the mixture consists of ingredients of unknown acute oral toxicity.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	34454-97-2	> 95
Residual Monomers	Mixture	< 5
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	68298-12-4	<= 0.2

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:
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. Suitable extinguishing media
In case of fire: Use a fire fighting agent suitable for ordinary combustible material such as water or foam to extinguish.

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
Hydrogen Fluoride	During Combustion
Oxides of Nitrogen	During Combustion
Oxides of Sulfur	During Combustion

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. 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
Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Clean up residue. Seal the container. Dispose of collected material as soon as possible.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Do not breathe thermal decomposition products. For industrial or professional use only. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Use personal protective equipment (gloves, respirators, etc.) as required.

7.2. Conditions for safe storage including any incompatibilities
Store away from heat.

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
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	34454-97-2	Manufacturer determined	TWA:1 mg/m3(0.07 ppm)	Skin Notation
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	68298-12-4	Manufacturer determined	TWA:0.5 mg/m3(0.04 ppm)	Skin Notation

ACGIH : American Conference of Governmental Industrial Hygienists
AIHA : American Industrial Hygiene Association
CMRG : Chemical Manufacturer's Recommended Guidelines
OSHA : United States Department of Labor - Occupational Safety and Health Administration
TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls
For those situations where the material might be exposed to extreme overheating due to misuse or equipment failure, use with appropriate local exhaust ventilation sufficient to maintain levels of thermal decomposition products below their exposure guidelines. 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
No protective gloves required. 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: 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:
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.

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

General Physical Form:	Solid
Specific Physical Form:	Waxy Solid
Odor, Color, Grade:	White to yellow waxy solid
Odor threshold	*No Data Available*
pH	*Not Applicable*
Melting point	149 ºF
Boiling Point	*Not Applicable*
Flash Point	No flash point
Evaporation rate	*Not Applicable*
Flammability (solid, gas)	Not Classified
Flammable Limits(LEL)	*Not Applicable*
Flammable Limits(UEL)	*Not Applicable*
Vapor Pressure	0.0106 mmHg [@ 55 ºC]
Vapor Density	*Not Applicable*
Density	1.56 g/cm3 [*Details:* As melt]
Specific Gravity	1.56 [*Ref Std:* WATER=1]
Solubility In Water	141 ppm [@ 24 ºC]
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	*Not Applicable*
Decomposition temperature	*No Data Available*
Viscosity	*Not Applicable*
Average particle size	*No Data Available*
Bulk density	*No Data Available*
Hazardous Air Pollutants	*No Data Available*
Molecular weight	*No Data Available*
Volatile Organic Compounds	*No Data Available*
Percent volatile	*No Data Available*
Percent volatile	*No Data Available*
Softening point	*No Data Available*
VOC Less H2O & Exempt Solvents	*No Data Available*

SECTION 10: Stability and reactivity

10.1. Reactivity
This material is considered to be non reactive under normal use conditions.

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Hazardous polymerization will not occur.

10.4. Conditions to avoid
None known.

10.5. Incompatible materials
None known.

No Data Available

10.6. Hazardous decomposition products

Substance	Condition
None known.	

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 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 cause additional health effects (see below).

Skin Contact:
Contact with the skin during product use is not expected to result in significant irritation. May cause additional health effects (see below).

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

Ingestion:
May be harmful if swallowed.
Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

May cause additional health effects (see below).

Additional Health Effects:

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

Prolonged or repeated exposure may cause target organ effects:
Liver Effects: Signs/symptoms may include loss of appetite, weight loss, fatigue, weakness, abdominal tenderness and jaundice.

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

Toxicological Data
If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Ingestion		No data available; calculated ATE 2,000 - 5,000 mg/kg
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	Ingestion	Rat	LD50 > 2,000 mg/kg
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	Ingestion	Rat	LD50 200-2000 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	Rabbit	No significant irritation
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	Rabbit	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	Rabbit	Mild irritant
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	Rabbit	Severe irritant

Skin Sensitization

Name	Species	Value
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	Guinea pig	Not sensitizing
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	Guinea pig	Not sensitizing

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
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	In Vitro	Not mutagenic
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	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
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	Ingestion	Not toxic to female reproduction	Rat	NOAEL 250 mg/kg/day	premating & during gestation
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	Ingestion	Not toxic to male reproduction	Rat	NOAEL 250 mg/kg/day	premating & during gestation
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	Ingestion	Toxic to development	Rat	NOAEL 50 mg/kg/day	premating & during gestation
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	Ingestion	Toxic to reproduction and/or development	Rat	NOAEL 150 mg/kg	
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	Ingestion	Toxic to female reproduction	Rat	NOAEL 150 mg/kg/day	premating & during gestation
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	Ingestion	Toxic to male reproduction	Rat	NOAEL 150 mg/kg/day	28 days
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	Ingestion	Toxic to development	Rat	NOAEL 150 mg/kg/day	premating & during gestation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	Ingestion	nervous system	May cause damage to organs	Rat	LOAEL 2,000 mg/kg	not applicable
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	Ingestion	nervous system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 200 mg/kg	not applicable

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	Ingestion	liver	May cause damage to organs though prolonged or repeated exposure	Rat	NOAEL 50 mg/kg/day	28 days
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	Ingestion	immune system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 50 mg/kg/day	28 days
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	Ingestion	kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 250 mg/kg/day	28 days
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-n-(2-Hydroxyethyl)-N-Methyl-	Ingestion	heart | endocrine system | hematopoietic system | nervous system | respiratory system	All data are negative	Rat	NOAEL 250 mg/kg/day	28 days
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	Ingestion	nervous system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 150 mg/kg/day	premating & during gestation
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-Nonafluoro-N-Methyl-	Ingestion	hematopoietic system | liver | immune system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation
1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-	Ingestion	heart | endocrine system | kidney	All data are negative	Rat	NOAEL 1,000	premating & during

Nonafluoro-N-Methyl-		and/or bladder | respiratory system			mg/kg/day	gestation

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

Ecotoxicological information

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

Chemical fate information

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

SECTION 13: Disposal considerations

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

Dispose of waste product in a permitted industrial waste facility. As a disposal alternative, incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Combustion products will include halogen acid (HCl/HF/HBr). 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.

EPA Hazardous Waste Number (RCRA): Not regulated

SECTION 14: Transport Information

For Transport Information, please visit **http://3M.com/Transportinfo** or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information

15.1. US Federal Regulations
Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - Yes

15.2. State Regulations
Contact 3M for more information.

15.3. Chemical Inventories
The components of this material are in compliance with the provisions of the Korean Toxic Chemical Control Law. Certain

restrictions may apply. Contact the selling division for additional information.

The components of this product are in compliance with the chemical notification requirements of TSCA.

Contact 3M for more information.

15.4. International Regulations

Contact 3M for more information.

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: Other information

NFPA Hazard Classification
Health: 3 **Flammability:** 1 **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.

HMIS Hazard Classification
Health: *1 **Flammability:** 1 **Physical Hazard:** 0 **Personal Protection:** X - See PPE section.

Hazardous Material Identification System (HMIS® III) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS® III ratings are to be used with a fully implemented HMIS® III program. HMIS® is a registered mark of the American Coatings Association (ACA).

Document Group:	31-7491-9	**Version Number:**	2.00
Issue Date:	06/12/15	**Supercedes Date:**	12/09/14

DISCLAIMER: The information in this Safety Data Sheet (SDS) is believed to be correct as of the date issued. 3M MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of use or application. Given the variety of factors that can affect the use and application of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for user's method of use or application.

3M provides information in electronic form as a service to its customers. Due to the remote possibility that electronic transfer may have resulted in errors, omissions or alterations in this information, 3M makes no representations as to its completeness or accuracy. In addition, information obtained from a database may not be as current as the information in the SDS available directly from 3M

3M USA SDSs are available at www.3M.com