



## Material Safety Data Sheet

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### SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** 3M (TM) Novec (TM) Fluorosurfactant FC-4432  
**MANUFACTURER:** 3M  
**DIVISION:** Specialty Materials

**ADDRESS:** 3M Center  
 St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

**Issue Date:** 06/04/2004  
**Supersedes Date:** 03/29/2004

**Document Group:** 16-3531-7

#### Product Use:

Specific Use: WETTING AND LEVELING AGENT FOR INDUSTRIAL COATINGS  
 \*\* MIX BEFORE USING! \*\*

### SECTION 2: INGREDIENTS

Ingredient	C.A.S. No.	% by Wt
FLUOROALIPHATIC POLYMERIC ESTERS +(6391P)	Trade Secret	87 - 93
POLYETHER POLYMER +(6437)	Trade Secret	5 - 10
1-METHYL-2-PYRROLIDINONE	872-50-4	4 - 6
TOLUENE	108-88-3	< 1
2-PROPENOIC ACID, 2-[METHYL[(NONAFLUOROBUTYL)SULFONYL]AMINO]ETHYL ESTER	67584-55-8	0 - 0.5

### SECTION 3: HAZARDS IDENTIFICATION

#### 3.1 EMERGENCY OVERVIEW

**Specific Physical Form:** Liquid

**Odor, Color, Grade:** viscous clear to cloudy amber with a slight mercaptan odor.

**General Physical Form:** Liquid

**Immediate health, physical, and environmental hazards:** Closed containers exposed to heat from fire may build pressure and explode. Flammable liquid and vapor. May cause severe eye irritation. May cause allergic skin reaction. (CAS No. 67584-55-8) May cause target organ effects. Contains a chemical or chemicals which can cause birth defects or other reproductive harm. Toluene (CAS No. 108-88-3) and 1-Methyl-2-pyrrolidinone (872-50-4)

## 3.2 POTENTIAL HEALTH EFFECTS

### Eye Contact:

Single exposure may cause:

Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.

### Skin Contact:

Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

Prolonged or repeated exposure may cause:

Moderate Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, and dryness.

May be absorbed through skin and cause target organ effects.

(CAS No. 67584-55-8)

### Inhalation:

Upper Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Single exposure, above recommended guidelines, may cause:

Pulmonary Edema: Signs/symptoms may include chest discomfort, shortness of breath, significant cough with frothy sputum production, bluish colored skin (cyanosis), increased heart rate and possible respiratory failure, and may be fatal.

May be absorbed following inhalation and cause target organ effects.

### Ingestion:

Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, nausea, diarrhea and vomiting.

### Target Organ Effects:

Blood Effects: Signs/symptoms may include generalized weakness and fatigue, skin pallor, and fever.

Central Nervous System (CNS) Depression: Signs/symptoms may include headache, dizziness, drowsiness, incoordination, nausea, slowed reaction time, slurred speech, giddiness, and unconsciousness.

Prolonged or repeated exposure, above recommended guidelines, may cause:

Bone Marrow Effects: Signs/symptoms may include generalized weakness, pallor of the skin, fatty infiltration of the bone marrow, decreases in the numbers of circulating blood cells, increased susceptibility to infection.

Contains a chemical or chemicals which can cause birth defects or other reproductive harm.

Toluene (CAS No. 108-88-3) and 1-Methyl-2-pyrrolidinone (872-50-4)

## SECTION 4: FIRST AID MEASURES

### 4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

**Eye Contact:** Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention.

**Skin Contact:** Remove contaminated clothing and shoes. Immediately flush skin with large amounts of water. Get medical attention. Wash contaminated clothing and clean shoes before reuse.

**Inhalation:** Remove person to fresh air. If signs/symptoms develop, get medical attention.

**If Swallowed:** Do not induce vomiting. Give victim two glasses of water. Never give anything by mouth to an unconscious person. Get immediate medical attention.

## SECTION 5: FIRE FIGHTING MEASURES

### 5.1 FLAMMABLE PROPERTIES

<b>Autoignition temperature</b>	<i>No Data Available</i>
<b>Flash Point</b>	82 °C [ <i>Test Method:</i> Pensky-Martens Closed Cup]
<b>Flammable Limits - LEL</b>	<i>No Data Available</i>
<b>Flammable Limits - UEL</b>	<i>No Data Available</i>

### 5.2 EXTINGUISHING MEDIA

Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

### 5.3 PROTECTION OF FIRE FIGHTERS

**Special Fire Fighting Procedures:** 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 equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

**Unusual Fire and Explosion Hazards:** Closed containers exposed to heat from fire may build pressure and explode. Flammable liquid and vapor.

**Note:** See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

**Accidental Release Measures:** Observe precautions from other sections. Call 3M- HELPS line (1-800-364-3577) for more information on handling and managing the spill. Evacuate unprotected and untrained personnel from hazard area. The spill should be cleaned up by qualified personnel. 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. 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. Collect as much of the spilled material as possible. Clean up residue with water. Collect the resulting residue containing solution. Place in a closed container approved for transportation by appropriate authorities.

**In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.**

## SECTION 7: HANDLING AND STORAGE

### 7.1 HANDLING

Avoid contact with oxidizing agents. No smoking while handling this material. Keep away from heat, sparks, open flame, pilot lights and other sources of ignition. Avoid static discharge. Avoid eye contact with vapors, mists, or spray. Avoid skin contact. Avoid breathing of vapors, mists or spray. Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits. If ventilation is not adequate, use respiratory protection equipment.

### 7.2 STORAGE

Store away from acids. Store away from heat. Store out of direct sunlight. Store away from oxidizing agents. Keep container in well-ventilated area.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 ENGINEERING CONTROLS

Provide appropriate local exhaust when product is heated. Provide appropriate local exhaust ventilation on open containers.

### 8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

#### 8.2.1 Eye/Face Protection

Avoid eye contact with vapors, mists, or spray. Avoid eye contact.  
The following eye protection(s) are recommended: Indirect Vented Goggles and Full Faceshield.

#### 8.2.2 Skin Protection

Avoid skin contact.

Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials.

Gloves made from the following material(s) are recommended: Butyl Rubber, Polyethylene/Ethylene Vinyl Alcohol.

#### 8.2.3 Respiratory Protection

Avoid breathing of vapors, mists or spray.  
Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Fullface supplied-air respirator. Consult the current 3M Respiratory Selection Guide for additional information or call 1-800-243-4630 for 3M technical assistance.

#### 8.2.4 Prevention of Swallowing

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

### 8.3 EXPOSURE GUIDELINES

<u>Ingredient</u>	<u>Authority</u>	<u>Type</u>	<u>Limit</u>	<u>Additional Information</u>
1-METHYL-2-PYRROLIDINONE	AIHA	TWA	10 ppm	Skin Notation*
TOLUENE	ACGIH	TWA	50 ppm	Skin Notation*; Table A4

TOLUENE	CMRG	STEL	75 ppm	Skin Notation*
TOLUENE	OSHA	TWA, Vacated	100 ppm	
TOLUENE	OSHA	STEL, Vacated	150 ppm	
TOLUENE	OSHA	TWA	200 ppm	Table Z-2
TOLUENE	OSHA	CEIL	300 ppm	Table Z-2

\* Substance(s) refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly, by direct contact with the substance. Vehicles can alter skin absorption.

VAC Vacated PEL: Vacated Permissible Exposure Limits [PEL] are enforced as the OSHA PEL in some states. Check with your local regulatory agency.

#### SOURCE OF EXPOSURE LIMIT DATA:

ACGIH: American Conference of Governmental Industrial Hygienists

CMRG: Chemical Manufacturer Recommended Guideline

OSHA: Occupational Safety and Health Administration

AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

<b>Specific Physical Form:</b>	Liquid
<b>Odor, Color, Grade:</b>	viscous clear to cloudy amber with a slight mercaptan odor.
<b>General Physical Form:</b>	Liquid
<b>Autoignition temperature</b>	<i>No Data Available</i>
<b>Flash Point</b>	82 °C [ <i>Test Method:</i> Pensky-Martens Closed Cup]
<b>Flammable Limits - LEL</b>	<i>No Data Available</i>
<b>Flammable Limits - UEL</b>	<i>No Data Available</i>
<b>Boiling point</b>	>=110 °C
<b>Density</b>	1.3 g/ml
<b>Vapor Density</b>	4.1 [ <i>Ref Std:</i> AIR=1]
<b>Vapor Pressure</b>	0.29 mmHg [ <i>Details:</i> CONDITIONS: @ 20C]
<b>Specific Gravity</b>	1.3 [ <i>Ref Std:</i> WATER=1]
<b>pH</b>	<i>Not Applicable</i>
<b>Melting point</b>	<i>Not Applicable</i>
<b>Solubility In Water</b>	100 % [ <i>Details:</i> CONDITIONS: @ 25C]
<b>Evaporation rate</b>	<i>No Data Available</i>
<b>Volatile Organic Compounds</b>	78 g/l [ <i>Test Method:</i> calculated SCAQMD rule 443.1]
<b>Percent volatile</b>	<=1 %
<b>VOC Less H2O &amp; Exempt Solvents</b>	78 g/l [ <i>Test Method:</i> calculated SCAQMD rule 443.1]
<b>Viscosity</b>	2500 - 7000 centipoise

## SECTION 10: STABILITY AND REACTIVITY

**Stability:** Stable.

**Materials and Conditions to Avoid:** Strong oxidizing agents

**Hazardous Polymerization:** Hazardous polymerization will not occur.

### Hazardous Decomposition or By-Products

**Substance**

Carbon monoxide  
Carbon dioxide  
Hydrogen Fluoride  
Oxides of Nitrogen  
Oxides of Sulfur

**Condition**

During Combustion  
During Combustion  
During Combustion  
During Combustion  
During Combustion

## SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

## SECTION 12: ECOLOGICAL INFORMATION

### ECOTOXICOLOGICAL INFORMATION

Not determined.

### CHEMICAL FATE INFORMATION

Not determined.

## SECTION 13: DISPOSAL CONSIDERATIONS

**Waste Disposal Method:** Incinerate in an industrial or commercial facility. Combustion products will include HF. Facility must be capable of handling halogenated materials.

As a disposal alternative, dispose of waste product in a facility permitted to accept chemical waste.

Since regulations vary, consult applicable regulations or authorities before disposal.

## SECTION 14: TRANSPORT INFORMATION

**ID Number(s):**

98-0212-3044-0, 98-0212-3045-7, 98-0212-3046-5, 98-0212-3047-3

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

## SECTION 15: REGULATORY INFORMATION

**US FEDERAL REGULATIONS**

This material contains one or more substances which are subject to a TSCA Consent Order or Significant New Use Rule.

Contact 3M for more information.

**311/312 Hazard Categories:**

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

**Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):**

<u>Ingredient</u>	<u>C.A.S. No</u>	<u>% by Wt</u>
1-METHYL-2-PYRROLIDINONE	872-50-4	4 - 6
TOLUENE	108-88-3	< 1

**This material contains a chemical which requires export notification under TSCA Section 12[b]:**

<u>Ingredient (Category if applicable)</u>	<u>C.A.S. No</u>	<u>Regulation</u>	<u>Status</u>
FLUOROALIPHATIC POLYMERIC ESTERS +(6391P)	Trade Secret	Toxic Substances Control Act (TSCA) 5 SNUR or Consent Order Chemicals	Applicable
1-METHYL-2-PYRROLIDINONE	872-50-4	Toxic Substances Control Act (TSCA) 4 Test Rule Chemicals	Applicable

**STATE REGULATIONS**

Contact 3M for more information.

**CALIFORNIA PROPOSITION 65**

<u>Ingredient</u>	<u>C.A.S. No.</u>	<u>Classification</u>
1-METHYL-2-PYRROLIDINONE	872-50-4	*Developmental Toxin
TOLUENE	108-88-3	*Developmental Toxin

\* WARNING: contains a chemical or chemicals which can cause birth defects or other reproductive harm.

**CHEMICAL INVENTORIES**

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

The components of this product are listed on the Australian Inventory of Chemical Substances.

All the components of this product are listed on China's Inventory of Chemical Substances.

All applicable chemical ingredients in this material are listed on the European Inventory of Existing Chemical Substances (EINECS), or are exempt polymers whose monomers are listed on EINECS.

The components of this material are in compliance with the new chemical notification requirements for the Korean Existing Chemicals Inventory.

Contact 3M for more information.

**Additional Information:** New Jersey Trade Secret Registry (EIN) 04499600+

## INTERNATIONAL REGULATIONS

Contact 3M for more information.

**WHMIS:** Hazardous

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

## SECTION 16: OTHER INFORMATION

### NFPA Hazard Classification

**Health:** 2 **Flammability:** 1 **Reactivity:** 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:** 2 **Flammability:** 1 **Reactivity:** 0 **Protection:** X - See PPE section.

Hazardous Material Identification System (HMIS(r)) 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(r) ratings are to be used with a fully implemented HMIS(r) program. HMIS(r) is a registered mark of the National Paint and Coatings Association (NPCA).

**Reason for Reissue:** The MSDS has been revised because 3M has adopted the 16-section ANSI/ISO format. The potential hazards of the product have not changed. We encourage you to reread the MSDS and review the information.

### Revision Changes:

Section 1: Product name was modified.

Page Heading: Product name was modified.

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