

3M General Offices

3M Center
St. Paul, MN 55144-1000
612 733 1110
681

1710

MATERIAL SAFETY
DATA SHEET**3M**

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DIVISION: SPECIALTY CHEMICALS DIVISION

TRADE NAME:

FC-118 FLUORAD Brand Fluorochemical Surfactant

ID NUMBER/U.P.C.: 98-0211-4832-9 00-51135-02697-7 98-0211-4885-7 00-51135-02745-5
98-0211-8012-4 00-51135-10863-5 98-0211-8083-5 00-51135-10918-2
98-0211-8858-0 00-51135-10971-7

ISSUED: FEBRUARY 7, 1997
SUPERSEDES: AUGUST 23, 1996
DOCUMENT: 19-4221-7

C₇ F₁₅ COO NH₄

1. INGREDIENT	C.A.S. NO.	PERCENT
WATER	7732-18-5	80
AMMONIUM PERFLUOROOCTANOATE	3825-26-1	18
AMMONIUM PERFLUOROHEPTANOATE	6130-43-4	0.1
AMMONIUM PERFLUOROHXANOATE	21615-47-4	0.1
AMMONIUM PERFLUOROPENTANOATE	68259-11-0	0.1

2. PHYSICAL DATA

BOILING POINT: 100 C
(Typical)
VAPOR PRESSURE: 18 mmHg
VAPOR DENSITY: Calc @ 20C
0.62 Air = 1
Calc @ 20C
EVAPORATION RATE: < 1.0 Butyl Acetate = 1
SOLUBILITY IN WATER: complete
SP. GRAVITY: 1.12 Water = 1
PERCENT VOLATILE: 80 %
pH: ca. 5
VISCOSITY: N/D
MELTING POINT: N/A
APPEARANCE AND ODOR: Light colored liquid; slight odor.

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: > 100 C Setoflash
FLAMMABLE LIMITS - LEL: N/A
FLAMMABLE LIMITS - UEL: N/A
AUTOIGNITION TEMPERATURE: N/A
EXTINGUISHING MEDIA:
Water, Carbon dioxide, Dry chemical, Foam
SPECIAL FIRE FIGHTING PROCEDURES:
Wear full protective clothing, including helmet, self-contained,

Abbreviations: N/D - Not Determined N/A - Not Applicable

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3. FIRE AND EXPLOSION HAZARD DATA (continued)

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.
UNUSUAL FIRE AND EXPLOSION HAZARDS:
See Hazardous Decomposition section for products of combustion.

4. REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY - MATERIALS TO AVOID:
Not Applicable
HAZARDOUS POLYMERIZATION: Will Not Occur
HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon Monoxide and Carbon Dioxide, Oxides of Nitrogen, Hydrogen Fluoride, Ammonia.

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE:

Refer to other sections of this MSDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment. In the U.S.A., call (612) 733-1110 or (612) 733-6100 for 24-hour spill assistance. Contain spill. Cover with absorbent material. Collect spilled material.

For spills to ground: Collect contaminated soil. Pump contaminated water from puddles or stagnant storm sewers. Place collected waste in approved containers, and seal. For spills to ground or surface water: Notify appropriate authorities. Contact 3M to evaluate further needs.

RECOMMENDED DISPOSAL:

Incinerate in an industrial or commercial facility in the presence of a combustible material. Combustion products will include HF.

Pass contaminated water through anion exchange resin. If necessary, contact 3M for assistance.

ENVIRONMENTAL DATA:

Data for product solids: Chemical Oxygen Demand (COD): Nil (0.000700g/g). Biochemical Oxygen Demand (BOD20): Nil; 96-Hr. LC50, Bluegill Sunfish (*Lepomis macrochirus*): 569 mg/L; 96-Hr. LC50, Fathead Minnow (*Pimephales promelas*): 766 mg/L; 48-Hr EC50, *Daphnia magna*: 632 mg/L; 14-Day EC50 (cell dry weight), Green Algae (*Selenastrum capricornutum*): 73 mg/L. Soil Adsorption Coefficient (Koc): 17, indicates very high mobility. (Study used a sandy loam soil).

REGULATORY INFORMATION:

Volatile Organic Compounds: N/A.
VOC Less H2O & Exempt Solvents: N/A.

Abbreviations: N/D - Not Determined N/A - Not Applicable.

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5. ENVIRONMENTAL INFORMATION (continued)

Since regulations vary, consult applicable regulations or authorities before disposal. U.S. EPA Hazardous Waste Number = None (Not U.S. EPA Hazardous).

The components of this product are in compliance with the chemical registration requirements of TSCA, EINECS, CDSL and AICS.

EPCRA HAZARD CLASS:

FIRE HAZARD: No PRESSURE: No REACTIVITY: No ACUTE: Yes CHRONIC: Yes

6. SUGGESTED FIRST AID

EYE CONTACT:

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

SKIN CONTACT:

Immediately wash skin with soap and large amounts of water. Remove contaminated clothing. If signs/symptoms occur, call a physician. Wash contaminated clothing before reuse and dispose of contaminated shoes.

INHALATION:

If signs/symptoms occur, remove person to fresh air. If signs/symptoms continue, call a physician.

IF SWALLOWED:

Do not induce vomiting. Drink two glasses of water. Call a physician.

7. PRECAUTIONARY INFORMATION

EYE PROTECTION:

Avoid eye contact. Wear vented goggles.

SKIN PROTECTION:

Avoid skin contact. Wear appropriate gloves when handling this material. A pair of gloves made from the following material(s) are recommended: butyl rubber. Use one or more of the following personal protection items as necessary to prevent skin contact: head covering, coveralls. Protective garments (other than gloves) should be made of either of the following materials: polyethylene/polyvinylidene chloride (Saranex)

Coverall made of Tyvek(r). Wear rubber boots when cleaning up spills.

VENTILATION PROTECTION:

Use with appropriate local exhaust ventilation. Provide sufficient ventilation to maintain emissions below recommended exposure limits. If exhaust ventilation is not adequate, use appropriate respiratory protection.

RESPIRATORY PROTECTION:

Avoid breathing of vapors, mists or spray. Avoid breathing of

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7. PRECAUTIONARY INFORMATION (continued)

airborne material. Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: full-face high-efficiency filter respirator, full-face supplied air respirator.

PREVENTION OF ACCIDENTAL INGESTION:

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

RECOMMENDED STORAGE:

Do not store containers on their sides. Store at room temperature. Keep container closed when not in use.

FIRE AND EXPLOSION AVOIDANCE:

Keep container tightly closed. No smoking while handling this material.

OTHER PRECAUTIONARY INFORMATION:

HMIS HAZARD RATINGS: HEALTH: 2 FLAMMABILITY: 1 REACTIVITY: 0
PERSONAL PROTECTION: X (See precautions, section 7.)

INGREDIENTS	EXPOSURE LIMITS		TYPE	AUTH	SKIN*
	VALUE	UNIT			
WATER	NONE	NONE	NONE	NONE	
AMMONIUM PERFLUOROOCTANOATE	0.01	mg/m ³	TWA	ACGIH	Y
AMMONIUM PERFLUOROHEPTANOATE	0.1	mg/m ³	TWA	3M	Y
AMMONIUM PERFLUOROHXANOATE	0.1	mg/m ³	TWA	3M	Y
AMMONIUM PERFLUOROPENTANOATE	0.1	mg/m ³	TWA	3M	Y

* SKIN NOTATION: Listed substances indicated with "Y" under SKIN 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.

SOURCE OF EXPOSURE LIMIT DATA:

- ACGIH: American Conference of Governmental Industrial Hygienists
- AIHA: American Industrial Hygiene Assoc. Workplace Environmental Exposure Level
- 3M: 3M Medical Department Guideline
- NONE: None Established

8. HEALTH HAZARD DATA

EYE CONTACT:

No toxicity data for the solution. Ammonium perfluoroalkyl carboxylate can be irritating to the eye and may cause eye injury from airborne exposure.

SKIN CONTACT:

May be absorbed through the skin and persist in the body for an

Abbreviations: N/D - Not Determined N/A - Not Applicable

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8. HEALTH HAZARD DATA (continued)

extended time.

No toxicity data for the solution. Ammonium perfluoroalkyl carboxylate is slightly toxic when absorbed through the skin; it is non-irritating to the skin.

INHALATION:

May be absorbed by inhalation and persist in the body for an extended time.

No toxicity data for the solution. Ammonium perfluoroalkyl carboxylate may cause respiratory system irritation from inhalation; can be considered moderately toxic by inhalation on a single exposure; a median lethal concentration for a 4-hour exposure in the albino rat is 980 milligrams per cubic meter. Repeated inhalation exposure produced liver changes and elevated blood organofluoride levels in rats.

IF SWALLOWED:

Ingestion is not a likely route of exposure to this product.

No toxicity data for the solution. Ammonium perfluoroalkyl carboxylate is considered moderately toxic from a single oral exposure; acute oral LD50 (rat) is 540 mg. per kg. of body weight.

CANCER:

WARNING: Contains a chemical which can cause cancer. (3825-26-1) (1983 and 1993 studies conducted jointly by 3M and DuPont).

MUTAGENICITY:

Ammonium perfluoroalkyl carboxylate was not mutagenic in invitro mutagenicity assays. Did not cause cell transformation in a mammalian cell transformation assay.

REPRODUCTIVE/DEVELOPMENTAL TOXINS:

Ammonium perfluoroalkyl carboxylate was not teratogenic in rabbits by oral administration and was not teratogenic to rats by gavage and inhalation exposures.

SECTION CHANGE DATES

HEALTH HAZD. DATA SECTION CHANGED SINCE AUGUST 23, 1996 ISSUE

Abbreviations: N/D - Not Determined N/A - Not Applicable

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SECTION CHANGE DATES

Abbreviations: N/D - Not Determined N/A - Not Applicable

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TRADE NAME:

FC-118 FLUORAD Brand Fluorochemical Surfactant

ID NUMBER/U.P.C.:

98-0211-4832-9 00-51135-02697-7 98-0211-4885-7 00-51135-02745-5
 98-0211-8012-4 00-51135-10863-5 98-0211-8083-5 00-51135-10918-2
 98-0211-8858-0 00-51135-10971-7

ISSUED: February 19, 1997

SUPERSEDES: February 07, 1997

DOCUMENT: 10-4221-7

1. INGREDIENT	C.A.S. NO.	PERCENT
WATER.....	7732-18-5	80
AMMONIUM PERFLUOROOCTANOATE.....	3825-26-1	18 - 21
AMMONIUM PERFLUOROHEPTANOATE.....	6130-43-4	0.1 - 1.0
AMMONIUM PERFLUOROHXANOATE.....	21615-47-4	0 - 0.1
AMMONIUM PERFLUOROPENTANOATE.....	68259-11-0	0.1 - 1.0

2. PHYSICAL DATA

BOILING POINT:..... 100 C
 (Typical)
 VAPOR PRESSURE:..... 18 mmHg
 Calc @ 20C
 VAPOR DENSITY:..... 0.62 Air=1
 Calc @ 20C
 EVAPORATION RATE:..... < 1.0 800Ac=1
 SOLUBILITY IN WATER:..... complete
 SPECIFIC GRAVITY:..... 1.12 Water=1
 PERCENT VOLATILE:..... 80 %
 pH:..... ca. 5
 VISCOSITY:..... N/D
 MELTING POINT:..... N/R

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

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2. PHYSICAL DATA (continued)

APPEARANCE AND ODOR:

Light colored liquid; slight odor.

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:..... > 100 C Setflash

FLAMMABLE LIMITS - LEL:..... N/A

FLAMMABLE LIMITS - UEL:..... N/A

AUTOIGNITION TEMPERATURE:..... N/A

EXTINGUISHING MEDIA:

Water, Carbon dioxide, Dry chemical, Foam

SPECIAL FIRE FIGHTING PROCEDURES:

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.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

See Hazardous decomposition section for products of combustion.

4. REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY - MATERIALS/CONDITIONS TO AVOID:

Not Applicable

HAZARDOUS POLYMERIZATION: Hazardous polymerization will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS:

Carbon Monoxide and Carbon Dioxide, Oxides of Nitrogen, Hydrogen Fluoride, Ammonia.

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE:

Refer to other sections of this MSDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment. In the U.S.A., call (612) 733-1110 or (612) 733-6108 for 24-hour spill assistance. Contain spill. Cover with absorbent material. Collect spilled material.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

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100-1000

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5. ENVIRONMENTAL INFORMATION (continued)

For spills to ground: Collect contaminated soil. Pump contaminated water from puddles or stagnant storm sewers. Place collected waste in approved containers, and seal. For spills to ground or surface water: Notify appropriate authorities. Contact 3M to evaluate further needs.

RECOMMENDED DISPOSAL:

Incinerate in an industrial or commercial facility in the presence of a combustible material. Combustion products will include HF.

Pass contaminated water through anion exchange resin. If necessary, contact 3M for assistance.

ENVIRONMENTAL DATA:

Data for product solids: Chemical Oxygen Demand (COD): Nil (0.00700g/g). Biochemical Oxygen Demand (BOD20): Nil; 96-Hr. LC50, Bluegill Sunfish (*Lepomis macrochirus*): 569 mg/L; 96-Hr. LC50, Fathead Minnow (*Pimephales promelas*): 766 mg/L; 48-Hr EC50, *Daphnia magna*: 632 mg/L; 14-Day EC50 (cell dry weight), Green Algae (*Scenedesmus capricornutum*): 73 mg/L. Soil Adsorption Coefficient (Koc): 17. Indicates very high mobility. (Study used a sandy loam soil).

REGULATORY INFORMATION:

Volatile Organic Compounds: N/A.
VOC Less H2O & Exempt Solvents: N/A.

Since regulations vary, consult applicable regulations or authorities before disposal. U.S. EPA Hazardous Waste Number = None (Not U.S. EPA Hazardous).

The components of this product are in compliance with the chemical registration requirements of TSCA, EINECS, CDSL and AICS.

EPERA HAZARD CLASS:

FIRE HAZARD: No PRESSURE: No REACTIVITY: No ACUTE: Yes CHRONIC: Yes

6. SUGGESTED FIRST AID

EYE CONTACT:

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

SKIN CONTACT:

Immediately wash skin with soap and large amounts of water. Remove contaminated clothing. If signs/symptoms occur, call a physician. Wash contaminated clothing before reuse and dispose of contaminated shoes.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

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6. SUGGESTED FIRST AID (continued)

INHALATION:

If signs/symptoms occur, remove person to fresh air. If signs/symptoms continue, call a physician.

IF SWALLOWED:

Do not induce vomiting. Drink two glasses of water. Call a physician.

7. PRECAUTIONARY INFORMATION

EYE PROTECTION:

Avoid eye contact. Wear vented goggles.

SKIN PROTECTION:

Avoid skin contact. Wear appropriate gloves when handling this material. A pair of gloves made from the following material(s) are recommended: butyl rubber. Use one or more of the following personal protection items as necessary to prevent skin contact: head covering, coveralls. Protective garments (other than gloves) should be made of either of the following materials: polyethylene/polyvinylidene chloride (Saranex)

Coverall made of Tyvek(r). Wear rubber boots when cleaning up spills.

RECOMMENDED VENTILATION:

Use with appropriate local exhaust ventilation. Provide sufficient ventilation to maintain emissions below recommended exposure limits. If exhaust ventilation is not adequate, use appropriate respiratory protection.

RESPIRATORY PROTECTION:

Avoid breathing of vapors, mists or spray. Avoid breathing of airborne material. Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: full-face high-efficiency filter respirator, full-face supplied air respirator.

PREVENTION OF ACCIDENTAL INGESTION:

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

RECOMMENDED STORAGE:

Do not store containers on their sides. Store at room temperature. Keep container closed when not in use.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

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GW001403

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7. PRECAUTIONARY INFORMATION (continued)

FIRE AND EXPLOSION AVOIDANCE:

Keep container tightly closed. Nonflammable.

OTHER PRECAUTIONARY INFORMATION:

No smoking: Smoking while using this product can result in contamination of the tobacco and/or smoke and lead to the formation of the hazardous decomposition products mentioned in section 4 of this MSDS.

HMIS HAZARD RATINGS: HEALTH: 2 FLAMMABILITY: 1 REACTIVITY: 0
PERSONAL PROTECTION: H (See precautions, section 7.)

EXPOSURE LIMITS

INGREDIENT	VALUE	UNIT	TYPE	ATH	SKIN*
WATER.....	NONE	NONE	NONE	NONE	
AMMONIUM PERFLUOROOCTANOATE.....	0.01	MG/M3	TWA	ACGIH	Y
AMMONIUM PERFLUOROHEPTANOATE.....	0.1	MG/M3	TWA	3M	Y
AMMONIUM PERFLUOROHENNOATE.....	0.1	MG/M3	TWA	3M	Y
AMMONIUM PERFLUOROPENTANOATE.....	0.1	MG/M3	TWA	3M	Y

* SKIN NOTATION: Listed substances indicated with 'Y' under SKIN 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.

SOURCE OF EXPOSURE LIMIT DATA:

- ACGIH: American Conference of Governmental Industrial Hygienists
- 3M: 3M Recommended Exposure Guidelines
- NONE: None Established

8. HEALTH HAZARD DATA

EYE CONTACT:

No toxicity data for the solution. Ammonium perfluoroalkyl carboxylate can be irritating to the eye and may cause eye injury from airborne exposure.

SKIN CONTACT:

May be absorbed through the skin and persist in the body for an extended time.

No toxicity data for the solution. Ammonium perfluoroalkyl carboxylate is slightly toxic when absorbed through the skin; it is non-irritating to the skin.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

EID008496

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8. HEALTH HAZARD DATA (continued)

INHALATION:

May be absorbed by inhalation and persist in the body for an extended time.

No toxicity data for the solution. Ammonium perfluoroalkyl carboxylate may cause respiratory system irritation from inhalation; can be considered moderately toxic by inhalation on a single exposure; a median lethal concentration for a 4-hour exposure in the albino rat is 980 milligrams per cubic meter. Repeated inhalation exposure produced liver changes and elevated blood organofluoride levels in rats.

IF SWALLOWED:

Ingestion is not a likely route of exposure to this product.

No toxicity data for the solution. Ammonium perfluoroalkyl carboxylate is considered moderately toxic from a single oral exposure; acute oral LD50 (rat) is 540 mg. per kg. of body weight.

CANCER:

WARNING: Contains a chemical which can cause cancer. (3025-26-1) (1983 and 1993 studies conducted jointly by 3M and DuPont).

MUTAGENICITY:

Ammonium perfluoroalkyl carboxylate was not mutagenic in *in vitro* mutagenicity assays. Did not cause cell transformation in a mammalian cell transformation assay.

REPRODUCTIVE/DEVELOPMENTAL TOXINS:

Ammonium perfluoroalkyl carboxylate was not teratogenic in rabbits by oral administration and was not teratogenic to rats by gavage and inhalation exposures.

SECTION CHANGE DATES

PRECAUTIONARY INFO. SECTION CHANGED SINCE February 07, 1997 ISSUE

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

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UWU01405

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