

3M Advanced Materials Division

# 3M™ Fluorosurfactant FC-4430

## Introduction

3M™ Fluorosurfactant FC-4430 is a non-ionic polymeric fluorochemical surfactant belonging to a class of coating additives which provide low surface tensions in coating systems best served by fluorochemical surfactants. 3M fluorosurfactant FC-4430 contributes excellent wetting, spreading and leveling properties to a variety of coating systems.

## Suggested Applications

3M fluorosurfactant FC-4430 may be used as a flow and leveling agent in various applications including architectural coatings, inks, paints, adhesives, caulks, high solids coatings, water reducible coatings, radiation curable coatings and other industrial coatings.

3M fluorosurfactant FC-4430 can be used in both water and solvent based coating formulations and can provide benefits for dirt pick up resistance and stain resistance in certain applications.

Recommended use level is between 0.05% and 0.3% active surfactant. However, use level can vary depending on the application and concentration of other additives and solvents in the formulation.

**Note:** All values determined at 77°F (25°C) unless otherwise specified

## Typical Physical Properties

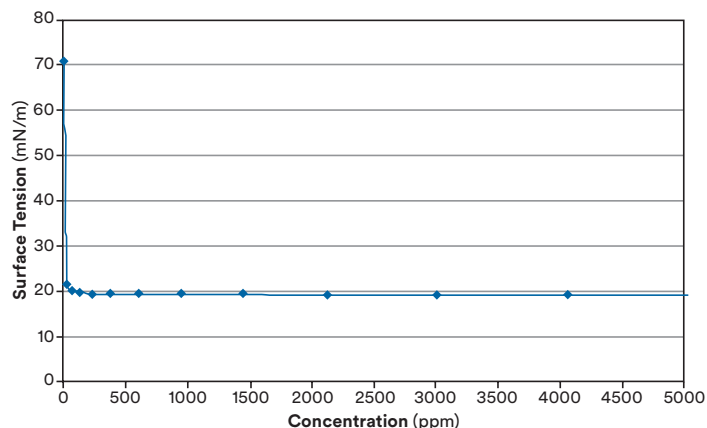
(Not for specification purposes)

| Properties                         | Typical Values                       |
|------------------------------------|--------------------------------------|
| Appearance                         | Clear, yellow viscous liquid         |
| Specific gravity                   | 1.14 g/cc                            |
| Flash point (Setaflash closed cup) | >93°C (200°F)                        |
| pH (of 1% aqueous solution)        | 4.5                                  |
| Viscosity (cP @ 25°C / 77°F)       | 2,000 - 6,000                        |
| Solubility in water                | Dispersible in all proportions       |
| Tg                                 | < 0°C                                |
| Type                               | Non-ionic                            |
| Composition                        | 90% polymeric fluorochemical actives |
|                                    | 8% non-fluorochemical actives        |
|                                    | 2% co-solvent (DPM, toluene)         |
| Freeze/thaw stability              | Protect from freezing*               |

\* If 3M fluorosurfactant FC-4430 freezes, warm it to >86°F (>30°C) until fluid. Freezing will not change physical properties or adversely affect performance.

## Surface Tension/CMC (in water)

3M fluorosurfactant FC-4430 is very efficient at reducing the surface tension in aqueous coating systems.



## Foaming

3M™ Fluorosurfactant FC-4430 shows low tendency to form foam in aqueous systems. This can translate into the ability to use less defoamer and/or a less aggressive defoamer additive in your formulation.

| Property                              | FC-4430 |
|---------------------------------------|---------|
| Foam Quality, %                       | 85.58   |
| Foam Stability, minutes (t 1/2 value) | 2       |

## Solubility

| Solvent              | Solvent grams of FC-4430/100 grams of solvent |
|----------------------|---|
| Butyl cellusolve     | >25   |
| Toluene              | >35   |
| Methyl ethyl ketone  | >25   |
| Dimethylformamide    | >25   |
| Isopropyl alcohol    | >25   |
| Methanol             | >25   |
| Dowanol™ PM          | >25   |
| Texanol™             | >25   |
| Proglyde™ DMM        | >25   |
| N-methyl pyrrolidone | >25   |
| Mineral spirits      | <1  |

## 3M™ Fluorosurfactant FC-4430 Static Surface Tensions in Water-Borne Resins

| Resin           | Control | HC Surfactant 1% | FC-4430 0.3% | Competitive FC Surfactant 0.3% | Silicone Surfactant 0.5% |
|-----------------|---------|------------------|--------------|--------------------------------|--------------------------|
| NeoCryl™ A-6099 | 39.1    | 29.0             | 24.3         | 26.1                           | 27.3                     |
| NeoRez™ R-941   | 43.1    | 29.8             | 21.2         | 24.4                           | 23.8                     |
| NeoRez™ R-9621  | 47.4    | 33.1             | 21.2         | 24.2                           | 22.8                     |
| Joncryl® 537    | 37.4    | 31.8             | 19.7         | 25.6                           | 27.6                     |
| Joncryl® 1532   | 38.4    | 32.9             | 21.2         | 26.9                           | 28.9                     |
| Joncryl® 1925   | 41.0    | 31.2             | 19.7         | 25.4                           | 27.1                     |
| Joncryl® 1972   | 38.9    | 27.6             | 22.4         | 26.3                           | 27.6                     |

## Interfacial Surface Tensions

| Surfactant          | Interfacial Tension Light Phase: Heptane (dynes/cm) |      |      | Interfacial Tension Light Phase: Cyclohexane (dynes/cm) |      |      |
|---------------------|---|------|------|---|------|------|
|                     | 200 ppm   | 0.5% | 1.0% | 200 ppm   | 0.5% | 1.0% |
| Control             |   | 43.7 |      |   | 51.2 |      |
| FC-4430             | 3.5   | 2.2  |      | 2.5   | 1.5  |      |
| SDS <sup>1</sup>    | 15.4  | 6.1  | 5.8  | 12.9  | 5    | 4.9  |
| SDBS <sup>2</sup>   | 15.9  | 4.1  | 3.7  | 13.5  | 2.9  | 2.6  |
| Silicone Dispersant | 14.4  | 10.9 | 10.5 | 11.7  | 8.8  | 8.8  |

<sup>1</sup>Sodium Dodecyl Sulfate

<sup>2</sup>Sodium Dodecyl Benzene Sulfonate

## Static Surface Tensions in Organic Solvents/Systems

| Solvent                    | Weight % FC-4430 |     |     |     |
|----------------------------|------------------|-----|-----|-----|
|                            | 0.0              | 0.1 | 0.2 | 0.5 |
| Distilled Water            | 72               | 23  | 21  | 20  |
| Methyl Alcohol             | 23               | 23  | 23  | 23  |
| Butyl Cellosolve           | 28               | 27  | 27  | 27  |
| Butyl Carbitol             | 30               | 29  | 29  | 29  |
| Methyl Ethyl Ketone        | 25               | 24  | 24  | 24  |
| Toluene                    | 28               | 28  | 28  | 28  |
| Dimethylformamide          | 33               | 33  | 33  | 32  |
| Polyethylene Triol LG-56   | 33               | 23  | 22  | 22  |
| Cycloaliphatic Epoxy Resin | 46               | 35  | 35  | 27  |
| Epon™ Resin 828-RS         | 45               | 22  | 19  | 18  |

**Note:** Data not for specification purposes

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## Thermal Stability

The active ingredient in 3M™ Fluorosurfactant FC-4430 exhibits good thermal stability when used in thermal processing applications.

### TGA data for FC-4430

This data shows the excellent thermal stability of 3M fluorosurfactant FC-4430 if used in a thermal processing application.

| Temperature (°C) | FC-4430 Specified % Weight Loss |
|------------------|---------------------------------|
| 195              | 5%                              |
| 255              | 10%                             |
| 305              | 50%                             |
| 330              | 80%                             |
| 355              | 90%                             |
| 405              | 95%                             |

(10 mg sample heated at 5°C/minute in air).  
Temperatures (°C) at which specified % weight loss occur.

## Regulatory Summary

- The PFBS-based surfactants produced by 3M have been reviewed by the U.S. EPA and placed on the TSCA inventory. There is a testing consent order in place which only applies to 3M, not 3M customers. The products are REACH compliant in Europe. The products are available for purchase in China, Korea, New Zealand, the Philippines and on a limited basis in Australia, Canada and Japan.
- PFBS and PFBS-based surfactants are not included in the U.S. EPA's PFAS Final Significant New Use Rule (SNUR) (67 Fed. Reg. 72854).

## Packaging

3M fluorosurfactant FC-4430 is currently available in:

- 8 lb. pails
- 40 lb. drums
- 250 lb. drums

## Product Safety and Handling

3M fluorosurfactant FC-4430 is intended for use in non-dispersive applications.

3M does not recommend this product for use in applications involving repeated exposure through skin contact, inhalation, or ingestion. It is not intended for food, cosmetic, medical or pharmaceutical usage. Neither 3M nor the U.S. Food and Drug Administration has evaluated or reviewed this product for food, cosmetic, medical or pharmaceutical applications.

It is the user's responsibility to determine whether a coating containing this product is durable and properly cured for the end use. Any used or unused material for disposal should be incinerated in an industrial or commercial facility in the presence of a combustible material. 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. For additional disposal information, see the product Safety Data Sheet.

For additional product safety and handling information, please read the product label and Safety Data Sheet before using this product.

## 3M Resources

To request a sample, place an order or request additional information, please contact your local 3M representative, an authorized 3M distributor or call 1 800 367 8905.

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unless otherwise specified

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