SAFETY DATA SHEET

Capstone™ FS-51 Fluorosurfactant

SECTION 1. IDENTIFICATION

Product name : Capstone™ FS-51 Fluorosurfactant
SDS-Identcode : 130000042668

Manufacturer or supplier's details
Company name of supplier : The Chemours Company FC, LLC
Address : 1007 Market Street
          Wilmington, DE 19899 United States of America (USA)
Telephone : 1-844-773-CHEM (outside the U.S. 1-302-773-1000)

Recommended use of the chemical and restrictions on use
Recommended use : Surfactant
Restrictions on use : For professional users only.
Do not use or resell Chemours™ materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless agreed to by Seller in a written agreement covering such use. For further information, please contact your Chemours representative.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200
Flammable liquids : Category 3
Specific target organ systemic toxicity - repeated exposure : Category 2 (Liver)

GHS label elements
Hazard pictograms : 
Signal Word : Warning
Hazard Statements : H226 Flammable liquid and vapor.
                   H373 May cause damage to organs (Liver) through prolonged or repeated exposure.
Precautionary Statements:

**Prevention:**
- P210 Keep away from heat/sparks/open flames/hot surfaces.
- No smoking.
- P233 Keep container tightly closed.
- P241 Use explosion-proof electrical/ventilating/lighting/equipment.
- P242 Use only non-sparking tools.
- P243 Take precautionary measures against static discharge.
- P260 Do not breathe mist or vapors.
- P280 Wear protective gloves/eye protection/face protection.

**Response:**
- P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P314 Get medical advice/attention if you feel unwell.

**Storage:**
- P403 + P235 Store in a well-ventilated place. Keep cool.

**Disposal:**
- P501 Dispose of contents/container to an approved waste disposal plant.

Additional Labeling:
The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 5.5%

Other hazards:
Inhalation of decomposition products in high concentration may cause shortness of breath (lung edema). Vapors may form explosive mixture with air.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical nature</td>
<td>Aqueous surfactant solution.</td>
</tr>
<tr>
<td></td>
<td>Fluoroadditive</td>
</tr>
<tr>
<td></td>
<td>Alcoholic solution</td>
</tr>
</tbody>
</table>

Components:

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-[3-(Dimethyloxidoamino)propyl]-3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-1-octanesulfonamide</td>
<td>80475-32-7</td>
<td>&gt;= 30 - &lt; 50</td>
</tr>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>&gt;= 30 - &lt; 50</td>
</tr>
</tbody>
</table>

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

**General advice:**
In the case of accident or if you feel unwell, seek medical advice immediately.
When symptoms persist or in all cases of doubt seek medical advice.

**If inhaled**
- If inhaled, remove to fresh air.
- Get medical attention if symptoms occur.

**In case of skin contact**
- In case of contact, immediately flush skin with plenty of water.
- Remove contaminated clothing and shoes.
- Get medical attention if symptoms occur.

**In case of eye contact**
- Flush eyes with water as a precaution.
- Get medical attention if irritation develops and persists.

**If swallowed**
- If swallowed, DO NOT induce vomiting.
- Get medical attention if symptoms occur.
- Rinse mouth thoroughly with water.

**Most important symptoms and effects, both acute and delayed**
- Inhalation may provoke the following symptoms:
  - Respiratory disorder
- Skin contact may provoke the following symptoms:
  - Discomfort
  - Itching
  - Redness
  - Swelling of tissue
- Eye contact may provoke the following symptoms
  - Irritation
  - Pain
  - tearing
  - Swelling of tissue
  - Redness
  - Impairment of vision
  - Lachrymation
- Ingestion may provoke the following symptoms:
  - Lack of coordination
  - narcosis
  - May cause damage to organs through prolonged or repeated exposure.

**Protection of first-aiders**
- First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists.

**Notes to physician**
- Treat symptomatically and supportively.

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### SECTION 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media**
- Water spray
- Alcohol-resistant foam
- Carbon dioxide (CO2)
- Dry chemical

**Unsuitable extinguishing media**
- High volume water jet
SAFETY DATA SHEET

Capstone™ FS-51 Fluorosurfactant

Specific hazards during fire fighting: Do not use a solid water stream as it may scatter and spread fire. Flash back possible over considerable distance. Vapors may form explosive mixtures with air. Exposure to combustion products may be a hazard to health.

Hazardous combustion products: Hydrogen fluoride, carbonyl fluoride, potentially toxic fluorinated compounds, aerosolized particulates, Carbon oxides

Specific extinguishing methods: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.

Special protective equipment for fire-fighters: In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Remove all sources of ignition. Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.

Environmental precautions: Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g., by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up: Non-sparking tools should be used. Soak up with inert absorbent material. Suppress (knock down) gases/vapors/mists with a water spray jet. For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.
SECTION 7. HANDLING AND STORAGE

Technical measures: See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Local/Total ventilation: Use with local exhaust ventilation. Use only in an area equipped with explosion-proof exhaust ventilation if advised by assessment of the local exposure potential.

Advice on safe handling: Avoid inhalation of vapor or mist. Do not swallow. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment. Non-sparking tools should be used. Keep container tightly closed. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. Take care to prevent spills, waste and minimize release to the environment.

Conditions for safe storage: Keep in properly labeled containers. Keep tightly closed. Keep in a cool, well-ventilated place. Store in accordance with the particular national regulations. Keep away from heat and sources of ignition.

Materials to avoid: Do not store with the following product types: Strong oxidizing agents Organic peroxides Flammable solids Pyrophoric liquids Pyrophoric solids Self-heating substances and mixtures Substances and mixtures which in contact with water emit flammable gases Explosives Gases

Further information on storage stability: Stable under normal conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>TWA</td>
<td>1,000 ppm 1,900 mg/m³</td>
<td>NIOSH REL</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

Capstone™ FS-51 Fluorosurfactant

Occupational exposure limits of decomposition products

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrofluoric acid</td>
<td>7664-39-3</td>
<td>TWA</td>
<td>3 ppm 2.5 mg/m³</td>
<td>NIOSH REL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>6 ppm 5 mg/m³</td>
<td>NIOSH REL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>3 ppm</td>
<td>OSHA Z-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>0.5 ppm (Fluorine)</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>2 ppm (Fluorine)</td>
<td>ACGIH</td>
</tr>
<tr>
<td>Carbonyl difluoride</td>
<td>353-50-4</td>
<td>TWA</td>
<td>2 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>124-38-9</td>
<td>TWA</td>
<td>5,000 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>630-08-0</td>
<td>TWA</td>
<td>25 ppm</td>
<td>ACGIH</td>
</tr>
</tbody>
</table>

Engineering measures: Processing may form hazardous compounds (see section 10). Minimize workplace exposure concentrations. Use only in an area equipped with explosion-proof exhaust ventilation if advised by assessment of the local exposure potential. Use with local exhaust ventilation.

Personal protective equipment

Respiratory protection: General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where
concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection

Material: Chemical-resistant gloves

Remarks: Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Take note that the product is flammable, which may impact the selection of hand protection. Wash hands before breaks and at the end of workday.

Eye protection

Material: Safety glasses

Skin and body protection

Material: Flame retardant antistatic protective clothing, unless assessment demonstrates that the risk of explosive atmospheres or flash fires is low
Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc)

Hygiene measures

Material: Ensure that eye flushing systems and safety showers are located close to the working place.
When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: liquid
Color: clear, amber
Odor: alcohol-like
Odor Threshold: No data available
<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.1</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>176 °F / 80 °C (1,013 hPa)</td>
</tr>
<tr>
<td>Flash point</td>
<td>77 °F / 25 °C</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (liquids)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper explosion limit / Upper flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower explosion limit / Lower flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapor density</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.07 (68 °F / 20 °C)</td>
</tr>
<tr>
<td>Water solubility</td>
<td>100 g/l (68 °F / 20 °C)</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>&gt; 212 °F / &gt; 100 °C</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>&gt; 392 °F / &gt; 200 °C</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not explosive</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>The substance or mixture is not classified as oxidizing.</td>
</tr>
<tr>
<td>Particle size</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**SECTION 10. STABILITY AND REACTIVITY**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</td>
<td>Not classified as a reactivity hazard.</td>
</tr>
<tr>
<td>Chemical stability</td>
<td>Stable under normal conditions.</td>
</tr>
<tr>
<td>Possibility of hazardous react-</td>
<td>Flammable liquid and vapor.</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

Capstone™ FS-51 Fluorosurfactant

Vapors may form explosive mixture with air.
Can react with strong oxidizing agents.
Hazardous decomposition products will be formed at elevated temperatures.

Conditions to avoid: Heat, flames and sparks.
Incompatible materials: Oxidizing agents

Hazardous decomposition products
Thermal decomposition: Hydrofluoric acid
Carbonyl difluoride
Carbon dioxide
Carbon monoxide

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure
Inhalation
Skin contact
Ingestion
Eye contact

Acute toxicity
Not classified based on available information.

Components:

N-[3-(Dimethyloxidoamino)propyl]-3,3,4,4,5,6,6,7,7,8,8,8-tridecafluoro-1-octanesulfonamide:

<table>
<thead>
<tr>
<th>Acute oral toxicity</th>
<th>LD50 (Rat): &gt; 2,000 mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method: OECD Test Guideline 420</td>
<td></td>
</tr>
<tr>
<td>Assessment: The substance or mixture has no acute oral toxicity</td>
<td></td>
</tr>
</tbody>
</table>

Ethanol:

<table>
<thead>
<tr>
<th>Acute oral toxicity</th>
<th>LD50 (Rat): &gt; 5,000 mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method: OECD Test Guideline 401</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Acute inhalation toxicity</th>
<th>LC50 (Rat): 124.7 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time: 4 h</td>
<td></td>
</tr>
<tr>
<td>Test atmosphere: vapor</td>
<td></td>
</tr>
</tbody>
</table>

Skin corrosion/irritation
Not classified based on available information.

Components:

N-[3-(Dimethyloxidoamino)propyl]-3,3,4,4,5,6,6,7,7,8,8,8-tridecafluoro-1-octanesulfonamide:

<table>
<thead>
<tr>
<th>Species</th>
<th>Not tested on animals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>OECD Test Guideline 439</td>
</tr>
<tr>
<td>Result</td>
<td>No skin irritation</td>
</tr>
</tbody>
</table>
Ethanol:

Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation

Serious eye damage/eye irritation
Not classified based on available information.

Components:

N-[3-(Dimethyloxidoamino)propyl]-3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-1-octanesulfonamide:

Species: In Vitro - Bovine
Result: No eye irritation
Method: OECD Test Guideline 437

Ethanol:

Species: Rabbit
Result: Irritation to eyes, reversing within 21 days
Method: OECD Test Guideline 405

Respiratory or skin sensitization

Skin sensitization
Not classified based on available information.

Respiratory sensitization
Not classified based on available information.

Components:

N-[3-(Dimethyloxidoamino)propyl]-3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-1-octanesulfonamide:

Test Type: KeratinoSens assay
Routes of exposure: Skin contact
Species: Not tested on animals
Method: OECD Test Guideline 442D
Result: negative

Test Type: Direct Peptide Reactivity Assay (DPRA)
Routes of exposure: Skin contact
Species: Not tested on animals
Method: OECD Test Guideline 442C
Result: negative

Test Type: Magnusson-Kligman-Test
Routes of exposure: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative
Ethanol:
- Test Type: Local lymph node assay (LLNA)
- Routes of exposure: Skin contact
- Species: Mouse
- Result: negative

Germ cell mutagenicity
Not classified based on available information.

Components:

N-[3-(Dimethyloxidoamino)propyl]-3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-1-octanesulfonamide:
- Genotoxicity in vitro:
  - Test Type: Bacterial reverse mutation assay (AMES)
    Method: OECD Test Guideline 471
    Result: negative
  - Test Type: In vitro mammalian cell gene mutation test
    Method: OECD Test Guideline 476
    Result: negative
  - Test Type: in vitro micronucleus test
    Method: OECD Test Guideline 487
    Result: negative
- Germ cell mutagenicity - Assessment: Weight of evidence does not support classification as a germ cell mutagen.

Carcinogenicity
Not classified based on available information.

IARC
No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA
No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

NTP
No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
Reproductive toxicity
Not classified based on available information.

Components:

N-[3-(Dimethyloxidoamino)propyl]-3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-1-octanesulfonamide:

Effects on fertility: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative

Effects on fetal development: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative

Reproductive toxicity - Assessment: Weight of evidence does not support classification for reproductive toxicity

Ethanol:

Effects on fertility: Test Type: Two-generation reproduction toxicity study
Species: Mouse
Application Route: Ingestion
Result: negative

STOT-single exposure
Not classified based on available information.

STOT-repeated exposure
May cause damage to organs (Liver) through prolonged or repeated exposure.

Components:

N-[3-(Dimethyloxidoamino)propyl]-3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-1-octanesulfonamide:

Routes of exposure: Ingestion
Target Organs: Liver
Assessment: Shown to produce significant health effects in animals at concentrations of >10 to 100 mg/kg bw.

Repeated dose toxicity

Components:

N-[3-(Dimethyloxidoamino)propyl]-3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-1-octanesulfonamide:

Species: Rat, male and female
NOAEL: 1 mg/kg
LOAEL: 20 mg/kg
Application Route: Ingestion
Exposure time: 90 Days
Method: OECD Test Guideline 422

Ethanol:
Species: Rat
NOAEL: 1,280 mg/kg
LOAEL: 3,156 mg/kg
Application Route: Ingestion
Exposure time: 90 Days

Aspiration toxicity
Not classified based on available information.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

N-[3-(Dimethyloctamino)propyl]-3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-1-octanesulfonamide:

Toxicity to fish: LC50 (Onchorhynchus mykiss (rainbow trout)): 81.2 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates: EC50 (Acartia tonsa): 516 mg/l
Exposure time: 48 h
Method: ISO 14669 and PARCOM method

Toxicity to algae:
EC50 (Skeletonema costatum (marine diatom)): 8.5 mg/l
Exposure time: 72 h
Method: ISO 10253

NOEC (Skeletonema costatum (marine diatom)): 0.5 mg/l
Exposure time: 72 h
Method: ISO 10253

Ethanol:

Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): > 1,000 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates: EC50 (Ceriodaphnia (water flea)): > 1,000 mg/l
Exposure time: 48 h

Toxicity to algae:
ErC50 (Chlorella vulgaris (Fresh water algae)): 275 mg/l
Exposure time: 72 h

EC10 (Chlorella vulgaris (Fresh water algae)): 11.5 mg/l
Exposure time: 72 h

Toxicity to daphnia and other aquatic invertebrates (Chron-
SAFETY DATA SHEET

Capstone™ FS-51 Fluorosurfactant

Version 4.0  Revision Date: 12/04/2018  SDS Number: 1334741-00031  Date of last issue: 02/28/2017
Date of first issue: 02/27/2017

Toxicity to microorganisms:

EC50 (Pseudomonas putida): 6,500 mg/l
Exposure time: 16 h

Persistence and degradability

Components:

N-[3-(Dimethyloxidoamino)propyl]-3,3,4,4,5,6,6,7,7,8,8,8-tridecafluoro-1-octanesulfonamide:

Biodegradability: Result: Not readily biodegradable.
Method: OECD Test Guideline 301B

Ethanol:

Biodegradability: Result: Readily biodegradable.
Biodegradation: 84 %
Exposure time: 20 d

Bioaccumulative potential

Components:

N-[3-(Dimethyloxidoamino)propyl]-3,3,4,4,5,6,6,7,7,8,8,8-tridecafluoro-1-octanesulfonamide:

Partition coefficient: n-octanol/water: log Pow: > -1.35

Ethanol:

Partition coefficient: n-octanol/water: log Pow: -0.35

Mobility in soil
No data available

Other adverse effects
No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues: Dispose of in accordance with local regulations.

Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal. Empty containers retain residue and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury and/or death. If not otherwise specified: Dispose of as unused product.
SAFETY DATA SHEET

Capstone™ FS-51 Fluorosurfactant

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG
UN number : UN 1170
Proper shipping name : ETHANOL SOLUTION
Class : 3
Packing group : III
Labels : 3

IATA-DGR
UN/ID No. : UN 1170
Proper shipping name : Ethanol solution
Class : 3
Packing group : III
Labels : Flammable Liquids
Packing instruction (cargo aircraft) : 366
Packing instruction (passenger aircraft) : 355

IMDG-Code
UN number : UN 1170
Proper shipping name : ETHANOL SOLUTION
(Partially Fluorinated Surfactant)
Class : 3
Packing group : III
Labels : 3
EmS Code : F-E, S-D
Marine pollutant : yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

Domestic regulation

49 CFR
UN/ID/NA number : UN 1170
Proper shipping name : Ethanol solutions
Class : 3
Packing group : III
Labels : FLAMMABLE LIQUID
ERG Code : 127
Marine pollutant : yes(Partially Fluorinated Surfactant)

Special precautions for user
The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.
SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Component RQ (lbs)</th>
<th>Calculated product RQ (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butanone</td>
<td>78-93-3</td>
<td>5000</td>
<td>*</td>
</tr>
</tbody>
</table>

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 304 Extremely Hazardous Substances Reportable Quantity

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Component RQ (lbs)</th>
<th>Calculated product RQ (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen peroxide</td>
<td>7722-84-1</td>
<td>1000</td>
<td>*</td>
</tr>
</tbody>
</table>

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards

- Flammable (gases, aerosols, liquids, or solids)
- Specific target organ toxicity (single or repeated exposure)

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

Pennsylvania Right To Know

- N-[3-(Dimethyloxoamino)propyl]-3,3,4,4,5,5,6,6,7,8,8,8-tridecafluoro-1-octanesulfonamide: 80475-32-7
- Ethanol: 64-17-5
- Water: 7732-18-5
- Amino Perfluoroalkane: Trade secret
- Butanone: 78-93-3
- Propan-2-ol: 67-63-0
- Hydrogen peroxide: 7722-84-1

California Prop. 65

WARNING: This product can expose you to chemicals including pentadecafluorooctanoic acid, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances

- Ethanol: 64-17-5

California Permissible Exposure Limits for Chemical Contaminants

- Ethanol: 64-17-5
SECTION 16. OTHER INFORMATION

Further information

**NFPA 704:**

- **Flammability:** 3
- **Health:** 0
- **Special hazard:** 0
- **Instability:** 0

**HMIS® IV:**

- **HEALTH:** *
- **FLAMMABILITY:** 3
- **PHYSICAL HAZARD:** 0

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

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Before use read Chemours safety information.

For further information contact the local Chemours office or nominated distributors.

All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

**Full text of other abbreviations**

- **ACGIH:** USA. ACGIH Threshold Limit Values (TLV)
- **NIOSH REL:** USA. NIOSH Recommended Exposure Limits
- **OSHA Z-1:** USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
- **OSHA Z-2:** USA. Occupational Exposure Limits (OSHA) - Table Z-2
- **ACGIH / TWA:** 8-hour, time-weighted average
- **ACGIH / STEL:** Short-term exposure limit
- **ACGIH / C:** Ceiling limit
- **NIOSH REL / TWA:** Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
- **NIOSH REL / ST:** STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
- **NIOSH REL / C:** Ceiling value not be exceeded at any time.
- **OSHA Z-1 / TWA:** 8-hour time weighted average
- **OSHA Z-2 / TWA:** 8-hour time weighted average

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized Sys-

Revision Date: 12/04/2018

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

US / Z8