Material Safety Data Sheet

AF Amorphous Fluoropolymer Solutions

Version 2.3

Revision Date 07/27/2011

Ref. 150000000912

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product name</th>
<th>AF Amorphous Fluoropolymer Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Grade/Type</td>
<td>AF 601S2-100-6, AF 601S2-1-6, AF 601S2-1-18, AF 601S2-100-18 (AF 1601 SOL FC) AF 400S2-100-1 (AF 2400 SOL FC)</td>
</tr>
<tr>
<td>MSDS Number</td>
<td>150000000912</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>DuPont</td>
</tr>
<tr>
<td></td>
<td>1007 Market Street</td>
</tr>
<tr>
<td></td>
<td>Wilmington, DE 19898</td>
</tr>
<tr>
<td>Product Information</td>
<td>1-800-441-7515 (outside the U.S. 1-302-774-1000)</td>
</tr>
<tr>
<td>Medical Emergency</td>
<td>1-800-441-3637 (outside the U.S. 1-302-774-1139)</td>
</tr>
<tr>
<td>Transport Emergency</td>
<td>CHEMTREC: 1-800-424-9300 (outside the U.S. 1-703-527-3887)</td>
</tr>
</tbody>
</table>

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview
Vapour during processing may be irritating to the respiratory tract and to the eyes.

Potential Health Effects
Skin
Hexafluoroacetone : May irritate skin.

Eyes
Hexafluoroacetone : May irritate eyes.

Repeated exposure
Hexafluoroacetone : DuPont has classified this material as a probable human developmental toxin. DuPont has classified this material as a probable human reproductive toxin.

Target Organs
Hexafluoroacetone : Liver Kidney Testes
Carcinogenicity
None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>C5-18-Perfluoro Compounds</td>
<td>86508-42-1</td>
<td>&gt;75%</td>
</tr>
<tr>
<td>Dioxole/TFE Copolymer</td>
<td>37626-13-4</td>
<td>&lt;25%</td>
</tr>
</tbody>
</table>

May contain as trace impurity:
Hexafluoroacetone 684-16-2 <0.01 %

SECTION 4. FIRST AID MEASURES

Skin contact: Wash off immediately with soap and plenty of water. Wash contaminated clothing before re-use.
Eye contact: Rinse with plenty of water. Call a physician immediately.
Inhalation: Move to fresh air. If victim has stopped breathing: Artificial respiration and/or oxygen may be necessary. Call a physician immediately.
Ingestion: If swallowed Drink 1 or 2 glasses of water. Induce vomiting immediately and call a physician. Never give anything by mouth to an unconscious person.
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**SECTION 5. FIREFIGHTING MEASURES**

Flammable Properties
Flash point : does not flash

Fire and Explosion Hazard : Hazardous thermal decomposition products:
Hydrogen fluoride
Carbon monoxide
Hexafluoroacetone
Perfluoroisobutylene
potentially toxic fluorinated compounds

Suitable extinguishing media : Water, Foam, Dry chemical, Carbon dioxide (CO2)

Firefighting Instructions : In the event of fire, wear self-contained breathing apparatus. Wear suitable protective equipment. Wear neoprene gloves during cleaning up work after a fire.
Protect from hydrogen fluoride fumes which react with water to form hydrofluoric acid.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

NOTE: Review FIREFIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Safeguards (Personnel) : Wear personal protective equipment. Evacuate personnel to safe areas. Ventilate the area. Wear respiratory protection.

Spill Cleanup : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

**SECTION 7. HANDLING AND STORAGE**

Handling (Personnel) : Avoid contact with skin, eyes and clothing. Avoid contamination of cigarettes or tobacco with dust from this material. Do not breathe vapours or fumes that may be evolved during processing. Do not use a torch to clean this material from equipment without local exhaust ventilation and respirator.
Do not contaminate tobacco products.

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Storage: Keep in a well-ventilated place. Keep tightly closed. Keep away from food and drink.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: Use local exhaust to completely remove vapors and fumes liberated during hot processing from the work area.

Personal protective equipment

Respiratory protection: Use respirator when performing operations involving potential exposure to vapour of the product. Wear a positive-pressure supplied-air respirator.

Eye protection: Safety glasses with side-shields. Wear coverall chemical splash goggles and face shield when the possibility exists for eye and face contact due to splashing or spraying of material.

Skin and body protection: impervious clothing
- Apron
- Boots
- Recommended preventive skin protection
- Neoprene

Exposure Guidelines

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Hexafluoroacetone

AEL *(DUPONT) 0.1 ppm 8 & 12 hr. TWA, Skin

Remarks: Men and women not of childbearing capability.
0.005 ppm 8 & 12 hr. TWA, Skin

Remarks: Women of childbearing capability.

TLV (ACGIH) 0.1 ppm TWA

PEL: (OSHA) 0.1 ppm Time Weighted Average (TWA): 0.7 mg/m³

REL (NIOSH) 0.1 ppm Time Weighted Average (TWA): 0.7 mg/m³
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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>liquid</td>
</tr>
<tr>
<td>Color</td>
<td>colourless</td>
</tr>
<tr>
<td>Odor</td>
<td>none</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>102 - 221 °C (216 - 430 °F)</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.8 - 1.9</td>
</tr>
<tr>
<td>Water solubility</td>
<td>insoluble</td>
</tr>
</tbody>
</table>

SECTION 10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Stable under normal conditions.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>Temperature &gt; 200 °C (&gt; 392 °F) Heating can release hazardous gases.</td>
</tr>
<tr>
<td>Incompatibility</td>
<td>Powdered metals Finely divided aluminium, magnesium, Strong oxidizing agents, Contact with incompatible materials can cause fire and explosion.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Hazardous decomposition products: Hydrogen fluoride, Hexafluoroacetone, perfluoroisobutylene</td>
</tr>
</tbody>
</table>

SECTION 11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>&gt; 25,000 mg/kg , rat</td>
</tr>
<tr>
<td>Skin irritation</td>
<td>rabbit slight irritation</td>
</tr>
<tr>
<td>Eye irritation</td>
<td>rabbit Contact with eyes may cause irritation.</td>
</tr>
</tbody>
</table>
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Further information: Persons with preexisting diseases of the lungs may have increased susceptibility to the toxicity of excessive exposures.

C5-18-Perfluoro Compounds

Repeated dose toxicity: Inhalation rat

No toxicologically significant effects were found. The toxicological data has been taken from products of similar composition.

Oral - gavage rat

No toxicologically significant effects were found. Information given is based on data obtained from similar substances.

Mutagenicity: Evidence suggests this substance does not cause genetic damage in animals.

Dioxole/TFE Copolymer

Dermal: Due to its physical properties, there is no potential for adverse effects.

Inhalation: Due to its physical properties, there is no potential for adverse effects.

Skin sensitization: Due to its physical properties, there is no potential for adverse effects.

Carcinogenicity: Due to its physical properties, there is no potential for adverse effects.

Mutagenicity: Due to its physical properties, there is no potential for adverse effects.

Reproductive toxicity: Due to its physical properties, there is no potential for adverse effects.

Teratogenicity: Due to its physical properties, there is no potential for adverse effects.

Hexafluoroacetone

Dermal LD50: 113 mg/kg, rabbit

Inhalation 4 h LC50: 225 ppm, rat

Inhalation: Liver effects

Kidney effects

Mutagenicity: Did not cause genetic damage in cultured bacterial cells.

Teratogenicity: Animal testing showed effects on embryo-foetal development at levels

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below those causing maternal toxicity.

SECTION 12. ECOLOGICAL INFORMATION

Aquatic Toxicity
C5-18-Perfluoro Compounds
96 h : Pimephales promelas (fathead minnow) > 1,000 mg/l
LC50 : Daphnia > 1,000 mg/l
0.5 h : EC50 Photobacterium phosphoreum > 1,000 mg/l

Dioxole/TFE Copolymer

: This product has no known eco-toxicological effects.

Additional ecological information

: No data is available on the product itself.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal

: In accordance with local and national regulations. Incinerate only if incinerator is capable of scrubbing out hydrogen fluoride and other acidic combustion products.

SECTION 14. TRANSPORT INFORMATION

Not classified as dangerous in the meaning of transport regulations.

SECTION 15. REGULATORY INFORMATION

TSCA Status

: On the inventory, or in compliance with the inventory
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SARA 313 Regulated Chemical(s)  :  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.

California Prop. 65  :  WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Hexafluoroacetone

SECTION 16. OTHER INFORMATION

Restrictions for use  :  Do not use DuPont materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless the material has been provided from DuPont under a written contract that is consistent with DuPont policy regarding medical applications and expressly acknowledges the contemplated use. For further information, please contact your DuPont representative. You may also request a copy of the DuPont POLICY Regarding Medical Applications H-50103-3 and DuPont CAUTION Regarding Medical Applications H-50102-3.

For further information contact the local DuPont office or DuPont's nominated distributors.
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Significant change from previous version is denoted with a double bar.