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## SAFETY DATA SHEET

Section 1- IDENTIFICATION		
COMPOSITION <b>YF3</b>		PRODUCT NAME <b>Yttrium Fluoride</b>
SUPPLIER: <b>Plasmaterials, Inc. 2268 Research Drive Livermore, CA 94550 Ph: 925-447-4030</b>	RECOMMENDED USE: <b>Laboratory Chemicals Scientific Research</b>	EMERGENCY TELEPHONE NUMBERS <b>US: 001-800-424-9300 Europe: 001-703-527-3887</b>

Section 2- HAZARD(S) IDENTIFICATION	
<b>Physical Hazards:</b> Not Classified	<b>Acute Toxicity, Inhalation:</b> Category 4 (H332)
<b>Serious Eye Irritation/Eye Damage:</b> Category 2A (H319)	<b>Environmental Hazards:</b> Not Classified
<b>Skin Corrosion/Irritation:</b> Category 2 (H315)	<b>OSHA Defined Hazards:</b> Not Classified
<b>Acute Toxicity, Oral:</b> Category 4 (H302)	<b>Acute Toxicity, Dermal:</b> Category 4 (H312)
<b>Specific Target Organ Toxicity – single exposure:</b> Category 3 (H335) Respiratory Tract Irritation	
<b>LABEL ELEMENTS: Signal Word: Warning</b>	



### HAZARD STATEMENTS

- H302: Harmful, if swallowed
- H312: Harmful in contact with skin
- H315: Causes skin irritation
- H319: Causes serious eye irritation
- H332: Harmful if inhaled
- H335: May cause respiratory irritation

### PRECAUTIONARY STATEMENTS

- P260: Do not breath dust/fume/gas/mist/vapors/spray
- P261: Avoid breathing dust/fume/gas/mist/vapors/spray
- P264: Wash face, hands and any exposed skin thoroughly after handling
- P270: Do not eat, drink or smoke when using this product
- P280: Wear protective gloves, protective clothing, eye protection and face protection
- P301+P312+P330: IF SWALLOWED: Call a poison center/doctor if you feel unwell. Rinse mouth
- P304+P341+P312: IF INHALED: Remove victim to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
- P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P332+P313: IF SKIN IRRITATION OCCURS: Get medical advice/attention
- P337+P313: IF EYE IRRITATION PERSISTS: Get medical advice/attention
- P362+P364: Take off contaminated clothing and wash it before reuse
- P403+P233: Store in a well-ventilated place. Keep container tightly closed.
- P420: Store away from incompatible material

-P501: Dispose of contents/container in accordance with local/regional/national/international regulations  
**Hazards not otherwise classified (HNOC):**  
-None identified

### Section 3- COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS-No	Molecular Weight
Yttrium Fluoride	13709-49-4	145.9 g/mol

### Section 4- FIRST AID MEASURES

**GENERAL ADVICE:** If exposed or concerned, get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

**INHALATION:** Remove victim from exposure to fresh air. Give oxygen if breathing is difficult. If not breathing, give artificial respiration. Call a poison center/doctor if you feel unwell.

**SKIN CONTACT:** Remove contaminated clothing. Wash with plenty of soap and water. Get medical advice/attention if you feel unwell. If skin irritation occurs, get medical advice/attention. Wash contaminated clothing before reuse.

**EYE CONTACT:** Do not rub eyes. Immediately, flush eyes with lukewarm water, lifting upper and lower lids, for at least 15 minutes. Remove contact lenses if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

**INGESTION:** Rinse mouth with water. If vomiting occurs, keep head low so that stomach content does not get into the lungs. Never give anything by mouth to an unconscious person. Get medical advice/attention if you feel unwell.

**MOST IMPORTANT SYMPTOMS/EFFECTS:** The most important known symptoms and effects are described in the labeling (see section 2). Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Skin Irritation. May cause redness and pain.

**INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED:** No data available

### Section 5- FIREFIGHTING MEASURES

<b>Suitable Extinguishing Media:</b> Water Fog, Foam, Dry Chemical Powder, Carbon Dioxide (CO <sub>2</sub> )	<b>Unsuitable Extinguishing Media:</b> Do not use water jet as an extinguisher, as this will spread the fire.
<b>Specific Hazards Arising from the Chemical:</b> During fire, gases hazardous to health may be formed.	
<b>Protective Equipment &amp; Precautions for Firefighters:</b> As in any fire, Firefighters must wear full face, self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective clothing to prevent contact with skin and eyes.	
<b>Firefighting Instructions/Specific Methods:</b> Use standard firefighting procedures and consider the hazards of other involved materials. Use fire-extinguishing media appropriate for surrounding materials. Move containers from fire area if you can do so without risk.	
<b>General Fire Hazards:</b> No unusual fire or explosion hazards noted.	

### Section 6- ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Do not touch or walk through spilled material. Avoid inhalation of dust. Avoid breathing dust, vapors, mist or gas. For personal protection see Section 8.

**Environmental Precautions:** Avoid discharge into drains, water courses or onto the ground.

**Methods for Containment & Clean Up:** Avoid dispersal of dust in the air (i.e. clearing dust surfaces)

with compressed air). Stop the flow of material, if this is without risk.  
 -Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water. Sweep up or vacuum up spillage and collect in suitable container for disposal.  
 -Never return spills to original containers for re-use.  
 -For waste disposal see Section 13.

### Section 7- HANDLING AND STORAGE

**Handling:** Minimize dust generation and accumulation. Do not taste or swallow. Avoid breathing dust. Avoid contact with eyes. Avoid prolonged exposure. Use only outdoors or in a well-ventilated area. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Wash contaminated clothing before reuse.

**Storage:** Store in original tightly closed container. Store away from incompatible materials (see Section 10).

### Section 8- EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Exposure Guidelines:

Component	CAS-No.	Value	Control Parameters	Basis
Yttrium Fluoride	13709-49-4	TWA	1 mg/m <sup>3</sup>	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Pulmonary Fibrosis		
		TWA	2.5 mg/m <sup>3</sup>	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Bone damage Fluorosis Not classifiable as a human carcinogen Substances for which there is a Biological Exposure Index or Indices varies		
		TWA	1 mg/m <sup>3</sup>	USA. NIOSH Pocket Guide to Chemical Hazards Materials
		TWA	2.5 mg/m <sup>3</sup>	USA. OSHA Table Z-2 (29 CFR 1910.1000)
		PEL	2.5 mg/m <sup>3</sup>	USA. Occupational Exposure Limits (OSHA) Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
		PEL	2.5 mg/m <sup>3</sup>	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	1 mg/m <sup>3</sup>	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

#### Biological Limit Values:

Component	CAS-No.	Value	Determinant	Specimen	Basis
Yttrium Fluoride	13709-49-4	2 mg/l	Fluoride	Urine	USA. ACGIH Biological Exposure Indices (BEI)
	Remarks	Prior to shift (16 hours after exposure ceases)			
		3 mg/l	Fluoride	Urine	USA. ACGIH Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

**Engineering Measures:** Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Ensure adequate ventilation, especially in confined areas. Avoid contact with eyes and skin. Provide eyewash station and

safety shower.

**Personal Protective Equipment:**

**Eye/Face Protection:** Wear safety glasses with side shields or goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

**Skin and Body Protection:** Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Wear suitable protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory Protection:** In case of insufficient ventilation, wear suitable respiratory equipment. Chemical respirator with organic vapor cartridge. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Thermal Hazards:** Wear appropriate thermal protective clothing when necessary.

**General Hygiene:** When using, do not eat, drink or smoke. Always observe good personal hygiene measures such as washing after handling the material and before eating, drinking and/or smoking. Wash hands before breaks and at the end of the workday. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

**Control of Environmental Exposure:** No information available

**Section 9- PHYSICAL AND CHEMICAL PROPERTIES**

**Physical State:** Solid

**Odor:** No data available

**Odor Threshold:** No data available

**pH:** No data available

**Melting Point/Range:** No data available

**Boiling Point/Range:** No data available

**Flash Point:** No data available

**Evaporation Rate:** No data available

**Flammability (solid,gas):** No data available

**Flammability or Exposure Limits:**

**Upper:** No data available

**Lower:** No data available

**Vapor Pressure:** No data available

**Vapor Density:** No data available

**Relative Density:** 4.010 g/cm<sup>3</sup>

**Solubility:** No data available

**Partition coefficient; n-octanol/water:** No data available

**Auto Ignition Temperature:** No data available

**Decomposition Temperature:** No data available

**Viscosity:** No data available

**Explosive Properties:** No data available

**Oxidizing Properties:** No data available

**Section 10- STABILITY AND REACTIVITY**

**Reactive Hazard:** Stable and non-reactive under normal conditions of use, storage and transport.

**Stability:** Stable under recommended storage conditions.

**Conditions to Avoid:** Keep away from heat, hot surfaces, spark, open flames and other ignition sources. Contact with incompatible materials

**Incompatible Materials:** Strong acids, strong oxidizing agents

**Hazardous Decomposition Products:**

Hazardous decomposition products formed under fire conditions – Hydrogen Fluoride; Yttrium Oxide

Other decomposition products - No data available

**Hazardous Polymerization:** No data available

**Hazardous Reactions:** No data available

## Section 11- TOXICOLOGICAL INFORMATION

### **Information on likely Routes of Exposure:**

**Inhalation:** Harmful if inhaled

**Skin Contact:** Harmful in contact with skin

**Eye Contact:** Direct contact with eyes may cause temporary irritation

**Ingestion:** Harmful if swallowed

**Symptoms related to the physical, chemical and toxicological characteristics:** Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling and blurred vision. May cause respiratory irritation. Skin irritation. May cause redness and pain.

### **Information on Toxicological Effects:**

**Acute Toxicity:** In high concentrations, vapors are anesthetic and may cause headache, fatigue, dizziness and central nervous system effects. Harmful if inhaled. Harmful in contact with skin. Harmful if swallowed. Causes skin irritation. Causes eye irritation.

**Skin Corrosion/Irritation:** Due to lack of data the classification is not possible

**Serious eye damage/irritation:** Direct contact with eyes may cause temporary irritation

**Respiratory or Skin Sensitization:** Due to lack of data the classification is not possible

**Carcinogenicity:** This product is not considered to be a carcinogen by IARC, ACGIH, NTP or OSHA

**Germ Cell Mutagenicity:** Due to lack of data the classification is not possible

**Reproductive Effects:** Due to lack of data the classification is not possible

**Development Effects:** Due to lack of data the classification is not possible

**Specific Target Organ Toxicity – single exposure:** May cause respiratory irritation

**Specific Target Organ Toxicity – repeated exposure:** Due to lack of data the classification is not possible

**Aspiration Hazard:** Due to lack of data the classification is not possible

**Chronic Effects:** Prolonged inhalation may be harmful

**Additional Information:** Salivation, nausea, abdominal pain, vomiting, fever, rapid respiration. Fluoride ion can reduce serum calcium levels possibly causing fatal hypocalcemia

**-To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.**

## Section 12- ECOLOGICAL INFORMATION

**Toxicity:** Not expected to be harmful to aquatic organisms. Not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

**Persistence and Degradability:** No information available

**Bioaccumulation/Accumulation:** No information available

**Mobility in Soil:** No information available

**Results of PBT and vPvB assessment:** PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

**Other Adverse Effects:** No information available

## Section 13- DISPOSAL CONSIDERATIONS

**Waste Disposal Methods:** Collect and reclaim or dispose in sealed containers to a licensed disposal company. Dispose of empty containers and contaminated packaging as unused product. Dispose of contents/container in accordance with local/regional/national/international regulations.

## Section 14- TRANSPORT INFORMATION

**DOT:** Not regulated as dangerous goods

**IATA:** Not regulated as dangerous goods

**IMDG/IMO:** Not regulated as dangerous goods

## Section 15- REGULATORY INFORMATION

### US Federal Regulations:

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt.D):** Not Regulated

**U.S. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052):** Not Regulated

**CERCLA Hazardous Substance List (40 CFR 302.4):** Not Listed

**SARA 302:** No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302

**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

**SARA 311/312 Hazards:** Yes

Classified Hazard Categories	Acute toxicity (any route of exposure)
	Skin corrosion or irritation
	Serious eye damage or eye irritation
	Specific target organ toxicity (single or repeated exposure)

**SARA 304 Emergency Release Notification:** Not Regulated

**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List:** Not regulated

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):** Not regulated

**Safe Drinking Water Act (SDWA):** Contains component(s) regulated under the Safe Drinking Water Act

**US Massachusetts Right to Know:** No information available

**US New Jersey Right to Know:**

Component	CAS No.	Revision Date
Yttrium Fluoride	13709-49-4	2008-06-01

**US Pennsylvania Right to Know:**

Component	CAS No.	Revision Date
Yttrium Fluoride	13709-49-4	2008-06-01

**US California Proposition 65:** This product does not contain any chemicals known to the State of California to cause cancer, birth defects or any other reproductive harm.

## Section 16- OTHER INFORMATION

The above information is accurate to the best of our knowledge. However, since data, safety standards and government regulations are subject to change, the conditions of handling and use, or misuse are beyond our control, Plasmaterials, Inc. makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Users should satisfy themselves that they have all current data relevant to their particular use.

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REVISION: 04-03-18