

# Material Safety Data Sheet

acc. to OSHA and ANSI

- **1 Identification of substance:**

- **Product details:**
- **Product name:** Ytterbium fluoride
- **Stock number:** 5670YD
- **Manufacturer/Supplier:**  
Nanostructured & Amorphous Materials, Inc.  
16840 Clay Road, Suite #113  
Houston, TX 77084, USA

- **2 Composition/Data on components:**

- **Chemical characterization:**  
**Description:**  
(CAS#)  
Ytterbium fluoride (CAS# 13860-80-0), 100%
- **Identification number(s):**
- **EINECS Number:** 237-354-2

- **3 Hazards identification**

- **Hazard description:** Xn Harmful
- **Information pertaining to particular dangers for man and environment**  
R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.  
R 36/37/38 Irritating to eyes, respiratory system and skin.  
**Classification system**

- **4 First aid measures**

- **After inhalation**  
Supply fresh air. If required, provide artificial respiration. Keep

patient warm. Consult doctor if symptoms persist.  
Seek immediate medical advice.

- **After skin contact**

Instantly wash with water and soap and rinse thoroughly.  
Seek immediate medical advice.

Rub in Ca-gluconate solution or Ca-gluconate gel immediately.

- **After eye contact**

Rinse opened eye for several minutes under running water. Then consult doctor.

- **After swallowing** Seek immediate medical advice.

- **5 Fire fighting measures**

- **Suitable extinguishing agents**

Use fire fighting measures that suit the environment.

- **Special hazards caused by the material, its products of combustion or**

- flue gases:**

Can be released in case of fire:

Hydrogen fluoride (HF)

- **Protective equipment:**

Wear self-contained breathing apparatus.

Wear full protective suit.

- **6 Accidental release measures**

- **Person-related safety precautions:**

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

- **Measures for environmental protection:**

Do not allow material to be released to the environment without proper governmental permits.

- **Measures for cleaning/collecting:**

Dispose of contaminated material as waste according to item 13.

Ensure adequate ventilation.

- **Additional information:**

See Section 7 for information on safe handling

See section 8 for information on personal protection equipment.

See Section 13 for information on disposal.

- **7 Handling and storage**

- **Handling**
- **Information for safe handling:**  
Keep containers tightly sealed.  
Store in cool, dry place in tightly closed containers.  
Ensure good ventilation/exhaustion at the workplace.
- **Information about protection against explosions and fires:**  
The product is not flammable
- **Storage**
- **Requirements to be met by storerooms and containers:**  
No special requirements.
- **Information about storage in one common storage facility:**  
Do not store together with acids.
- **Further information about storage conditions:**  
Keep container tightly sealed.  
Store in cool, dry conditions in well sealed containers.

- **8 Exposure controls and personal protection**

- **Additional information about design of technical systems:**  
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.
- **Components with critical values that require monitoring at the workplace:**

Fluorides (as F)	mg/m <sup>3</sup>
ACGIH TLV	2.5
Austria TWA	2.5
Belgium TWA	2.5
Finland TWA	2.5
France TWA	2.5
Germany MAK	2.5
Hungary TWA	1; 2-STEL
Netherlands TWA	3.5
Norway TWA	0.6
Poland TWA	1; 3-STEL
Sweden NGV	2
Switzerland MAK-W	1.5

United Kingdom TWA 2.5  
Russia TWA 2  
Denmark TWA 2.5  
USA PEL 2.5

- **Additional information:** No data

- **Personal protective equipment**

- **General protective and hygienic measures**

The usual precautionary measures should be adhered to in handling the chemicals.

Keep away from foodstuffs, beverages and food.

Instantly remove any soiled and impregnated garments.

Wash hands during breaks and at the end of the work.

Avoid contact with the eyes and skin.

- **Breathing equipment:** Use breathing protection with high concentrations.
- **Protection of hands:** Impervious gloves
- **Eye protection:**  
Safety glasses  
Face protection
- **Body protection:** Protective work clothing.

## • **9 Physical and chemical properties:**

- **General Information**

- **Form:** Crystalline

- **Colour:** White

- **Smell:** Odourless

- **Value/Range Unit Method**

- **Change in condition**

- **Melting point/Melting range:** 1157 ° C

- **Boiling point/Boiling range:** 2200 ° C

- **Sublimation temperature / start:** Not determined

- **Flash point:** Not applicable

- **Ignition temperature:** Not determined

- **Decomposition temperature:** Not determined

- **Danger of explosion:** Product is not explosive.

- **Critical values for explosion:**

- **Lower:** Not determined

- **Upper:** Not determined
- **Steam pressure:** Not determined
- **Density:** at 20°C 8.168 g/cm<sup>3</sup>
- **Solubility in / Miscibility with**
- **Water:** Insoluble  
Not miscible or difficult to mix

- **10 Stability and reactivity**

- **Thermal decomposition / conditions to be avoided:**  
No decomposition if used and stored according to specifications.
- **Materials to be avoided:** Acids
- **Dangerous reactions:** No dangerous reactions known
- **Dangerous products of decomposition:** Hydrogen fluoride

- **11 Toxicological information**

- **Acute toxicity:**
- **Primary irritant effect:**
- **on the skin:** Irritant for skin and mucous membranes.
- **on the eye:** Irritant effect.
- **Sensitization:** No sensitizing effect known.
- **Additional toxicological information:**  
Danger by skin resorption.  
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.  
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

- **12 Ecological information:**

- **General notes:**  
Do not allow material to be released to the environment without proper governmental permits.  
Water hazard class 1 (Self-assessment): slightly hazardous for water.

Do not allow undiluted product or large quantities of it to reach ground water, water bodies or sewage system.

- **13 Disposal considerations**

- **Product:**

- **Recommendation**

Consult state, local or national regulations for proper disposal.  
Hand over to disposers of hazardous waste.

Must be specially treated under adherence to official regulations.

- **Uncleaned packagings:**

- **Recommendation:**

Disposal must be made according to official regulations.

- **14 Transport information**

- **Land transport ADR/RID and GGVS/GGVE (cross-border/domestic)**

- **ADR/RID-GGVS/E Class:** 6.1 (T5) Toxic substances.

- **Kemler Number:** 60

- **UN-Number:** 3288

- **Packaging group:** III

- **Label** 6.1

- **Designation of goods:** 3288 TOXIC SOLID, INORGANIC, N.O.S.  
(ytterbium fluoride)

- **Maritime transport IMDG/GGVSea:**

- **IMDG/GGVSea Class:** 6.1

- **UN Number:** 3288

- **Label** 6.1

- **Packaging group:** III

- **Correct technical name:** TOXIC SOLID, INORGANIC, N.O.S. (ytterbium fluoride)

- **Air transport ICAO-TI and IATA-DGR:**

- **ICAO/IATA Class:** 6.1

- **UN/ID Number:** 3288

- **Label** 6.1

- **Packaging group:** III

- **Correct technical name:** TOXIC SOLID, INORGANIC, N.O.S. (ytterbium fluoride)

- **15 Regulations**

- **Designation according to EC guidelines:**

- **Code letter and hazard designation of product:** Xn Harmful

- **Risk phrases:**

20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

36/37/38 Irritating to eyes, respiratory system and skin.

- **Safety phrases:**

9 Keep container in a well-ventilated place.

26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

36/37 Wear suitable protective clothing and gloves.

- **National regulations**

- **Information about limitation of use:**

For use only by technically qualified individuals.

Employment restrictions concerning young persons must be observed.

- **Water hazard class:**

Water hazard class 1 (Self-assessment): slightly hazardous for water.

- **16 Other information:**

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.