



# Safety Data Sheet

Skyspring Nanomaterials, Inc.

www.ssnano.com

Revision Date: 01/01/2024

- **1 Identification of substance:**

- **Product details:**

- **Product name:** Hafnium (IV) oxide

- **Stock number:** 3810XX

- **Manufacturer/Supplier:**

SkySpring Nanomaterials, Inc.  
2935 Westhollow Dr., Houston, TX 77082, USA  
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- **2 Hazards identification**

- 2.1 Classification of the substance or mixture Not a hazardous substance or mixture.
- 2.2 GHS Label elements, including precautionary statements Not a hazardous substance or mixture.
- 2.3 Hazards not otherwise classified (HNO)

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

- **Chemical characterization:**

- Description:**

- (CAS#)**

- hafnium (IV) oxide (CAS# 12055-23-1): 100%

- **Identification number(s):**

- **EINECS Number:** 235-013-2

- **Additional information:**  
Hafnium is routinely found with a low level of zirconium since separation of the two elements is difficult.

- **4 First aid measures**

- **After inhalation**  
Supply fresh air. If required, provide artificial respiration. Keep patient warm.  
Seek immediate medical advice.
- **After skin contact**  
Immediately wash with water and soap and rinse thoroughly.  
Seek immediate medical advice.
- **After eye contact**  
Rinse opened eye for several minutes under running water.  
Then consult a doctor.
- **After swallowing** Seek medical treatment.

- **5 Fire fighting measures**

- **Suitable extinguishing agents**  
Product is not flammable. Use fire fighting measures that suit the surrounding fire.
- **Special hazards caused by the material, its products of combustion or resulting gases:**  
In case of fire, the following can be released:  
Metal oxide fume
- **Protective equipment:**  
Wear self-contained respirator.  
Wear fully protective impervious 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:** Pick up mechanically.
- **Additional information:**  
See Section 7 for information on safe handling  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

- **7 Handling and storage**

- **Handling**
- **Information for safe handling:**  
Keep container tightly sealed.  
Store in cool, dry place in tightly closed containers.  
No special precautions are necessary if used correctly.
- **Information about protection against explosions and fires:**  
The product is not flammable
- **Storage**
- **Requirements to be met by storerooms and receptacles:**  
No special requirements.
- **Information about storage in one common storage facility:**  
Store away from oxidizing agents.
- **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 limit values that require monitoring at the workplace:**

|                                    |                   |
|------------------------------------|-------------------|
| Hafnium, metal and compounds as Hf |                   |
|                                    | mg/m <sup>3</sup> |
| ACGIH TLV                          | 0.5               |
| Austria MAK                        | 0.5               |
| Belgium TWA                        | 0.5               |
| Denmark TWA                        | 0.5               |

|                     |               |
|---------------------|---------------|
| Finland TWA         | 0.5           |
| France VME          | 0.5           |
| Germany MAK         | 0.5           |
| Korea TLV           | 0.5           |
| Netherlands MAC-TGG | 0.5           |
| Norway TWA          | 0.5           |
| Poland TWA          | 0.5           |
| Switzerland MAK-W   | 0.5           |
| United Kingdom TWA  | 0.5; 1.5-STEL |
| USA PEL             | 0.5           |

- **Additional information:** No data

- **Personal protective equipment**

- **General protective and hygienic measures**

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

- **Breathing equipment:**

Use suitable respirator when high concentrations are present.

- **Protection of hands:**

Impervious gloves

Check protective gloves prior to each use for their proper condition.

- **Material of gloves**

The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

- **Eye protection:** Safety glasses

- **Body protection:** Protective work clothing.

- **9 Physical and chemical properties:**

- **General Information**

- **Form:** Powder

- **Color:** Off-white

- **Odor:** Odorless

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- **Change in condition**

- **Melting point/Melting range:** 2812 ° C

- **Boiling point/Boiling range:** 5400 ° C

- **Sublimation temperature / start:** Not determined
- **Flash point:** Not applicable
- **Ignition temperature:** Not determined
- **Decomposition temperature:** Not determined
- **Danger of explosion:**  
Product does not present an explosion hazard.
- **Explosion limits:**
- **Lower:** Not determined
- **Upper:** Not determined
- **Vapor pressure:** Not determined
- **Density:** at 20 ° C 9.68 g/cm<sup>3</sup>
- **Solubility in / Miscibility with**
- **Water:** Insoluble

- **10 Stability and reactivity**

- **Thermal decomposition / conditions to be avoided:**  
Decomposition will not occur if used and stored according to specifications.
- **Materials to be avoided:** Oxidizing agents
- **Dangerous reactions** No dangerous reactions known
- **Dangerous products of decomposition:** Metal oxide fume

- **11 Toxicological information**

- **Acute toxicity:**
- **Primary irritant effect:**
- **on the skin:** May cause irritation
- **on the eye:** May cause irritation
- **Sensitization:** No sensitizing effects known.
- **Subacute to chronic toxicity:**  
Hafnium and hafnium compounds may be irritating to the skin and eyes. There are reports of liver damage from hafnium exposure.

- **Additional toxicological information:**

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.

- **13 Disposal considerations**

- **Product:**

- **Recommendation**

Consult state, local or national regulations to ensure proper disposal.

- **Uncleaned packagings:**

- **Recommendation:**

Disposal must be made according to official regulations.

- **14 Transport information**

Not a hazardous material for transportation.

- **DOT regulations:**

- **Hazard class:** None

- **Land transport ADR/RID (cross-border)**

- **ADR/RID class:** None

- **Maritime transport IMDG:**

- **IMDG Class:** None

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

- **ICAO/IATA Class:** None

- **Transport/Additional information:**  
Not dangerous according to the above specifications.

- **15 Regulations**

- **Product related hazard information:**  
Observe the general safety regulations when handling chemicals
- **National regulations**  
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.  
All components of this product are listed on the Canadian Domestic Substances List (DSL).
- **Information about limitation of use:**  
For use only by technically qualified individuals.

- **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.