

## Material Safety Data Sheet

# Hafnium(IV) Oxide Powder

Report No.: VIH240912003-1  
Version: 2.1  
Preparation Date: 09/12/2024  
Revision Date: 09/12/2024

## 1. Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifier

Product Name	Hafnium(IV) Oxide
Product No.	720800PD
Formula	HfO <sub>2</sub>
CAS No.	12055-23-1
Synonyms	Hafnium dioxide, Hafnium oxide

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Laboratory chemicals, Scientific research
Uses advised against	Consulting manufacturers

### 1.3 Details of the supplier of the safety data sheet

Company Name	VI HALBLEITERMATERIAL GmbH
Street	Bergener Straße 14.,
City	Hannover
State	Niedersachsen
Zip Code	30625
Country	Germany
Tel	0049 1626484175
Email	info@vimaterial.de
Website	<a href="https://vimaterial.de/">https://vimaterial.de/</a>

### 1.4 Emergency telephone number

Emergency Phone #	0049 1626484175
-------------------	-----------------

## 2. Hazards Identification

### 2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

Hazardous respirable dust may be formed when used.

## 2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

Signal Word	Warning
Pictograms	

## Hazard Statements

EUH212	Warning! Hazardous respirable dust may be formed when used. Do not breathe dust.
--------	--

## Precautionary Statements

<b>Prevention</b>	
P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing dust/fume/mist/vapours/spray
P262	Do not get in eyes, on skin, or on clothing
P271	Use only outdoors or in a well-ventilated area
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing.
<b>Response</b>	
P308 + P313	IF exposed or concerned: Get medical advice/ attention.

## 2.3 Other hazards

In accordance with Annex XIII of the REACH Regulation, inorganic substances do not require assessment.

This product does not contain any known or suspected endocrine disruptors.

---

## 3. Composition/information on ingredients

### 3.1 Substances

Chemical Family	Ceramic
-----------------	---------

Component	CAS No.	EC No.	Concentration
Hafnium oxide (HfO <sub>2</sub> )	12055-23-1	235-013-2	<=100%

No components need to be disclosed according to the applicable regulations.

---

## 4. First aid measures

---

### 4.1 Description of first aid measures

General Treatment	If symptoms persist, seek medical attention.
Inhalation	Remove victim to fresh air. If respiratory problems, provide artificial respiration/oxygen. Get medical attention if you feel unwell.
Skin	Take off immediately all contaminated clothing. Rinse skin with water/ shower. Seek medical attention.
Eyes	Rinse with pure water for at least 15 minutes. Remove contact lenses, if present and easy to do. Seek medical attention.
Ingestion	Immediately rinse mouth and provide fresh air. Do not induce vomiting. Seek medical attention if you feel unwell.

### 4.2 Most important symptoms and effects, both acute and delayed

Most important symptoms and effects, both acute and delayed, are included on labelling (Section 2.2) and in Section 11.

### 4.3 Indication of any immediate medical attention and special treatment needed

1	Based on the symptoms that appear, provide targeted treatment.
2	Be aware that symptoms may be delayed.

---

## 5. Firefighting Measures

---

### 5.1 Extinguishing Media

Suitable extinguishing media	Use water spray, carbon dioxide (CO <sub>2</sub> ), dry chemical, alcohol-resistant foam
Unsuitable extinguishing media	N/A

### 5.2 Special hazards arising from the substance or mixture

1	Hafnium oxides
2	Not-flammable
3	Fine dust dispersed in air may ignite.

### 5.3 Advice for firefighters

Wear self-contained breathing apparatus as combustion may produce hazardous fumes.

---

## 6. Accidental Release Measures

---

### 6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Remove persons to safety. Avoid dust formation. Avoid breathing vapours, mist or gas.
For emergency responders	Wear breathing apparatus if exposed to vapours/dust/spray/gases.

### 6.2 Environmental Precautions

Should not be released into the environment.

### 6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill	Covering of drains, Take up mechanically.
Advice on how to clean up a spill	Sweep up and shovel. Take care not to raise dust.
Other information relating to spills and releases	Place in appropriate containers for disposal. Ventilate affected area.

### 6.4 Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

---

## 7. Handling and Storage

---

### 7.1 Precautions for safe handling

Recommendations	Wear personal protective equipment/face protection. Ensure adequate ventilation. Avoid contact with skin, eyes or clothing. Avoid ingestion and inhalation. Avoid dust formation
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

### 7.2 Conditions for safe storage, including any incompatibilities

Ventilation requirements	Keep containers tightly closed in a dry, cool and well-ventilated place.
Storage class (TRGS 510)	Non Combustible Solids

### 7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

---

## 8. Exposure Controls/Personal Protection

---

### 8.1 Control parameters

Ingredients with workplace control parameters.

#### Biological limit values:

No biological limit values established.

#### Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)

No data available

#### Predicted No-Effect Concentration (PNEC)

No data available

### 8.2 Exposure controls

#### Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

#### Personal protective equipment

##### Eye/face protection

Wear safety glasses with side shields (or goggles) (European standard - EN166) and face protection.

##### Skin protection

-Hand Protection

Protective gloves (The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.)

-Other protection measures

Long sleeved clothing. Wash hands thoroughly after handling.

#### Respiratory Protection

No protective equipment is needed under normal use conditions.

<b>Large scale/emergency use</b>	Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced Recommended Filter type: Particle filter
<b>Small scale/Laboratory use</b>	Maintain adequate ventilation Recommended half mask:- Valve filtering: EN405; or; Half mask:

---

	EN140; plusfilter, EN141
--	--------------------------

---

### Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

### Environmental exposure controls

No information available.

---

## 9. Physical and Chemical Characteristics

---

### 9.1 Information on basic physical and chemical properties

Physical State	Powder
Colour	White
Odor	Odorless
Melting Point/Range	2810 °C
Boiling Point/Range	No data available
Flammability (liquid)	Not applicable
Flammability (solid, gas)	No data available
Explosion limits	No data available
Flash Point	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
pH	No data available
Viscosity	Not applicable
Water Solubility	Insoluble
Solubility in other solvents	No data available
Partition Coefficient (n-octanol/water)	No data available
Vapor Pressure	No data available
Density / Specific Gravity	9.68 g/cm <sup>3</sup>
Vapor Density	Not applicable
Particle characteristics	No data available

### 9.2 Other information

Molecular formula	HfO <sub>2</sub>
Molecular weight	210.49 g/mol
Evaporation Rate	Not applicable - Solid

---

## 10. Stability and reactivity

---

### 10.1 Reactivity

None known, based on information available.

### 10.2 Chemical stability

Stable under normal conditions.

### 10.3 Possibility of hazardous reactions

**Hazardous Polymerization:** No information available

**Hazardous Reactions:** No information available

### 10.4 Conditions to avoid

No data available.

### 10.5 Incompatible materials

Strong oxidizing agents.

### 10.6 Hazardous decomposition products

Other decomposition products - No data available.

In the event of fire: see section 5

---

## 11. Toxicological information

### 11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity	Oral:	No data available
	Dermal:	No data available
	Inhalation:	No data available
Skin corrosion/irritation	No data available.	
Serious eye damage/irritation	No data available.	
Respiratory or skin sensitization	Respiratory	No data available.
	Skin	No data available.
Germ cell mutagenicity	No data available.	
Carcinogenicity	IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.	
Reproductive toxicity	No data available.	
STOT - single exposure	Inhalation - May cause respiratory irritation.	
STOT - repeated exposure	No data available.	
Aspiration hazard	Not applicable. Solid	

### 11.2 Information on other hazards

**Endocrine Disrupting Properties:** Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

---

## 12. Ecological Information

---

### 12.1 Toxicity

Toxicity	No data available
----------	-------------------

### 12.2 Persistence and degradability

Persistence	No data available
Degradability	No data available

### 12.3 Bioaccumulative potential

Bioaccumulative potential	No data available
---------------------------	-------------------

### 12.4 Mobility in soil

Mobility in soil	No data available
------------------	-------------------

### 12.5 Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	In accordance with Annex XIII of the REACH Regulation, inorganic substances do not require assessment.
------------------------------------	--

### 12.6 Endocrine disrupting properties

Endocrine Disruptor Information	This product does not contain any known or suspected endocrine disruptors.
---------------------------------	--

### 12.7 Other adverse effects

Persistent Organic Pollutant	This product does not contain any known or suspected substance
Ozone Depletion Potential	This product does not contain any known or suspected substance

---

## 13. Disposal Considerations

---

### 13.1 Waste treatment methods

Dispose of in accordance with all applicable local and national regulations. Use recovery/recycling where feasible, otherwise incineration is the recommended method of disposal. Empty containers may contain hazardous residues. Do not cut, puncture or weld on or near to the container. Labels should not be removed from containers until they have been cleaned. Contaminated containers must not be treated as household waste. Containers should be cleaned

by appropriate methods and then re-used or disposed of by landfill or incineration as appropriate.  
Do not incinerate closed containers.

---

## 14. Transport information

---

### IMDG

14.1. UN number	Not applicable
14.2. UN Proper shipping name	Not classified as hazardous for transport.
14.3. Transport hazard class(es)	Not applicable
14.4. Packaging group	Not applicable

### ADR/RID/ADN

14.1. UN number	Not applicable
14.2. UN Proper shipping name	Not classified as hazardous for transport.
14.3. Transport hazard class(es)	Not applicable
14.4. Packaging group	Not applicable

### ICAO-IATA/DGR

14.1. UN number	Not applicable
14.2. UN Proper shipping name	Not classified as hazardous for transport.
14.3. Transport hazard class(es)	Not applicable
14.4. Packaging group	Not applicable

14.5. Environmental hazards	No hazards identified
14.6. Special precautions for user	No special precautions required
14.7. Maritime transport in bulk according to IMO instruments	Not applicable, packaged goods

---

## 15. Regulatory information

---

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This Safety Data Sheet is prepared in accordance with Commission Regulation (EC) 1907/2006, amended by Commission Regulation (EU) 2020/878.

### Authorisations/Restrictions

Regulation (EC) 1907/2006, REACH, Annex XIV list of substances subject to authorisation:	Not applicable
Regulation (EC) 1907/2006, REACH, Annex XVII restrictions on the manufacture, placing on the market and use of certain dangerous substances:	Not applicable
Regulation (EC) 1005/2009 on substances that deplete the ozone layer:	Not applicable
Regulation (EC) 850/2004 on persistent organic pollutants, amended by (EU) No 2019/1021:	Not applicable

### 15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

---

## 16. Other information

### Revision information

Preparation date	09/12/2024
Revision date	09/12/2024
Revision reason	Creation.

### Abbreviations and acronyms

CAS	Chemical Abstracts Service
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
RID	Regulation concerning the International Carriage of Dangerous Goods by Rail
IATA	International Air Transportation Association
IMDG	International Maritime Dangerous Goods
LC50	Lethal Concentration 50%
LD50	Lethal Dose 50%
TWA	Time Weighted Average
STOT	Specific target organ toxicity
PBT	Persistent, Bioaccumulative, Toxic
vPvB	Very Persistent, very Bioaccumulative
WEL	Workplace exposure limit

### References

- [1] CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- [2] ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>
- [3] eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website:

[http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)

[4] Germany GESTIS-database on hazard substance, website:

<http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

[5] HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

[6] IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

[7] IPCS - The International Chemical Safety Cards (ICSC), website:

<http://www.ilo.org/dyn/icsc/showcard.home>

[8] ERG - Emergency Response Guidebook by U.S. Department of Transportation, website:

<http://www.phmsa.dot.gov/hazmat/library/erg>

### List of relevant phrases (code and full text as stated in chapter 2 and 3)

EUH212	Warning! Hazardous respirable dust may be formed when used. Do not breathe dust.
--------	--

### Disclaimer

The information of this safety data sheet is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products. For further information please contact [info@vimaterial.de](mailto:info@vimaterial.de).