

**HAFNIUM TETRAKIS(ETHYLMETHYLAMIDE)**

Safety Data Sheet OMHF083

Date of issue: 01/06/2015

Revision date: 05/25/2018

Version: 1.1

**SECTION 1: Identification****1.1. Identification**

Product name	: HAFNIUM TETRAKIS(ETHYLMETHYLAMIDE)
Product code	: OMHF083
Product form	: Substance
Physical state	: Liquid
Formula	: C <sub>12</sub> H <sub>32</sub> HfN <sub>4</sub>
Synonyms	: TETRAKIS(ETHYLMETHYLAMIDO)HAFNIUM
Chemical family	: ORGANOMETAL

**1.2. Recommended use and restrictions on use**

Recommended use : Chemical intermediate

**1.3. Supplier****GELEST, INC.**

11 East Steel Road  
Morrisville, PA 19067

**USA**

T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST

[info@gelest.com](mailto:info@gelest.com) - [www.gelest.com](http://www.gelest.com)

**1.4. Emergency telephone number**

Emergency number : CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

**SECTION 2: Hazard(s) identification****2.1. Classification of the substance or mixture****GHS-US classification**

Flammable liquids Category 2	H225	Highly flammable liquid and vapour
Skin corrosion/irritation Category 1B	H314	Causes severe skin burns and eye damage
Serious eye damage/eye irritation Category 1	H318	Causes serious eye damage
Specific target organ toxicity (single exposure) Category 3	H335	May cause respiratory irritation

Full text of H statements : see section 16

**2.2. GHS Label elements, including precautionary statements****GHS-US labeling**

Hazard pictograms (GHS-US) :



Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H225 - Highly flammable liquid and vapour  
H314 - Causes severe skin burns and eye damage  
H318 - Causes serious eye damage  
H335 - May cause respiratory irritation

Precautionary statements (GHS-US) : P280 - Wear protective gloves/protective clothing/eye protection/face protection.  
P260 - Do not breathe vapors.  
P264 - Wash hands thoroughly after handling.  
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. heat, open flames, sparks  
P240 - Ground/Bond container and receiving equipment  
P241 - Use explosion-proof electrical equipment  
P242 - Use only non-sparking tools.  
P243 - Take precautionary measures against static discharge.  
P271 - Use only outdoors or in a well-ventilated area.  
P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting  
P303+P361+P353 - If on skin (or hair): take off immediately all contaminated clothing. rinse skin with water/shower  
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing

# HAFNIUM TETRAKIS(ETHYLMETHYLAMIDE)

## Safety Data Sheet

P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P310 - Immediately call a doctor  
P363 - Wash contaminated clothing before reuse.  
P370+P378 - In case of fire: Use water spray, foam, carbon dioxide, dry chemical to extinguish.  
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.  
P403+P235 - Keep in a cool place  
P405 - Store locked up.  
P501 - Dispose of contents/container to licensed waste disposal facility.

### 2.3. Hazards not otherwise classified (HNOC)

No additional information available

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/Information on ingredients

### 3.1. Substances

Substance type : Mono-constituent  
Name : HAFNIUM TETRAKIS(ETHYLMETHYLAMIDE)  
CAS-No. : 352535-01-4

Name	Product identifier	%	GHS-US classification
Hafnium tetrakis(ethylmethylamide)	(CAS-No.) 352535-01-4	> 95	Flam. Liq. 2, H225 Skin Corr. 1B, H314 Eye Dam. 1, H318 STOT SE 3, H335

Full text of hazard classes and H-statements : see section 16

### 3.2. Mixtures

Not applicable

## SECTION 4: First-aid measures

### 4.1. Description of first aid measures

First-aid measures general : Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.  
First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.  
First-aid measures after skin contact : Wash with plenty of soap and water. Get immediate medical advice/attention.  
First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.  
First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Get medical advice/attention.

### 4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects : Causes severe skin burns and eye damage.  
Symptoms/effects after inhalation : May cause respiratory irritation. Overexposure may cause: Coughing. Headache. Nausea.  
Symptoms/effects after skin contact : Causes (severe) skin burns.  
Symptoms/effects after eye contact : Causes serious eye damage.  
Symptoms/effects after ingestion : May be harmful if swallowed.

### 4.3. Immediate medical attention and special treatment, if necessary

No additional information available

## SECTION 5: Fire-fighting measures

### 5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Water spray. Foam. Carbon dioxide. Dry chemical.  
Unsuitable extinguishing media : Water.

### 5.2. Specific hazards arising from the chemical

Fire hazard : Highly flammable liquid and vapour. Irritating fumes of diethylamine and organic acid vapors may develop when material is exposed to water or open flame.  
Explosion hazard : May form flammable/explosive vapor-air mixture.

### 5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Use water spray to cool exposed surfaces. Exercise caution when fighting any chemical fire.  
Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapor and mist.

# HAFNIUM TETRAKIS(ETHYLMETHYLAMIDE)

## Safety Data Sheet

### SECTION 6: Accidental release measures

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

General measures : Eliminate every possible source of ignition. Use special care to avoid static electric charges.

##### 6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

##### 6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

#### 6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

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

Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal. Use only non-sparking tools.

#### 6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Additional hazards when processed : Handle empty containers with care because residual vapors are flammable.

Precautions for safe handling : Provide good ventilation in process area to prevent accumulation of vapors. Containers must be properly grounded before beginning transfer. Take precautionary measures against static discharge. Use only non-sparking tools. Do not expose to moisture or air. Transfer product under an inert atmosphere.

Hygiene measures : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse.

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

Technical measures : Ground/bond container and receiving equipment. Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.

Storage conditions : Keep container tightly closed.

Incompatible materials : Acids. Alcohols. Moisture. Oxidizing agent. Water.

Storage area : Store in a well-ventilated place. Store away from heat.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

Hafnium tetrakis(ethylmethylamide) (352535-01-4)		
OSHA	OSHA PEL (TWA) (ppm)	25 ppm (Diethylamine)

#### 8.2. Appropriate engineering controls

Appropriate engineering controls : Provide local exhaust or general room ventilation.

#### 8.3. Individual protection measures/Personal protective equipment

##### Personal protective equipment:

Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

##### Hand protection:

Neoprene or nitrile rubber gloves

##### Eye protection:

Chemical goggles or face shield. Contact lenses should not be worn

##### Skin and body protection:

Wear suitable protective clothing

##### Respiratory protection:

NIOSH-certified combination organic vapor - amine gas (brown cartridge) respirator.

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

Physical state : Liquid

# HAFNIUM TETRAKIS(ETHYLMETHYLAMIDE)

## Safety Data Sheet

Appearance	: Viscous liquid. Fumes in air.
Molecular mass	: 410.9 g/mol
Color	: Yellow. Amber.
Odor	: Acrid. Amine.
Odor threshold	: No data available
Refractive index	: No data available
pH	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Melting point	: No data available
Freezing point	: < 25 °C
Boiling point	: 78 °C @ 0.01 mm Hg
Flash point	: 10 °C
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: Highly flammable liquid and vapour
Vapor pressure	: < 1 mm Hg
Relative vapor density at 20 °C	: > 1
Relative density	: 1.324
Solubility	: Reacts with water.
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosion limits	: No data available

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No additional information available

### 10.2. Chemical stability

Stable in sealed containers stored under a dry inert atmosphere.

### 10.3. Possibility of hazardous reactions

Reacts rapidly with water and moisture in air liberating ethylmethylthylamine.

### 10.4. Conditions to avoid

Heat. Open flame. Sparks.

### 10.5. Incompatible materials

Acids. Alcohols. Moisture. Oxidizing agent. Water.

### 10.6. Hazardous decomposition products

Ethylmethylamine. Hafnium dioxide.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Not classified

#### HAFNIUM TETRAKIS(ETHYLMETHYLAMIDE) (352535-01-4)

LD50 oral rat	> 10 g/kg
Skin corrosion/irritation	: Causes severe skin burns and eye damage.
Serious eye damage/irritation	: Causes serious eye damage.
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity – single exposure	: May cause respiratory irritation.

# HAFNIUM TETRAKIS(ETHYLMETHYLAMIDE)

## Safety Data Sheet

Specific target organ toxicity – repeated exposure	: Not classified
Aspiration hazard	: Not classified
Symptoms/effects after inhalation	: May cause respiratory irritation. Overexposure may cause: Coughing. Headache. Nausea.
Symptoms/effects after skin contact	: Causes (severe) skin burns.
Symptoms/effects after eye contact	: Causes serious eye damage.
Symptoms/effects after ingestion	: May be harmful if swallowed.
Reason for classification	: Expert judgment

### SECTION 12: Ecological information

#### 12.1. Toxicity

No additional information available

#### 12.2. Persistence and degradability

No additional information available

#### 12.3. Bioaccumulative potential

No additional information available

#### 12.4. Mobility in soil

No additional information available

#### 12.5. Other adverse effects

Other adverse effects	: This substance may be hazardous to the environment.
Effect on the ozone layer	: No additional information available

### SECTION 13: Disposal considerations

#### 13.1. Disposal methods

Product/Packaging disposal recommendations	: May be incinerated. Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.
Additional information	: Handle empty containers with care because residual vapors are flammable.
Ecology - waste materials	: Avoid release to the environment.

### SECTION 14: Transport information

#### 14.1. UN number

UN-No.(DOT)	: 2924
DOT NA no.	UN2924

#### 14.2. UN proper shipping name

Transport document description	: UN2924 Flammable liquids, corrosive, n.o.s. (HAFNIUM TETRAKIS(ETHYLMETHYLAMIDE)), 3 (8), II
Proper Shipping Name (DOT)	: Flammable liquids, corrosive, n.o.s. (HAFNIUM TETRAKIS(ETHYLMETHYLAMIDE))
Class (DOT)	: 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
Packing group (DOT)	: II - Medium Danger
Hazard labels (DOT)	: 3 - Flammable liquid 8 - Corrosive



DOT Packaging Non Bulk (49 CFR 173.xxx)	: 202
DOT Packaging Bulk (49 CFR 173.xxx)	: 243
DOT Packaging Exceptions (49 CFR 173.xxx)	: 150
DOT Symbols	: G - Identifies PSN requiring a technical name

#### 14.3. Additional information

Emergency Response Guide (ERG) Number	: 132
Other information	: No supplementary information available.

# HAFNIUM TETRAKIS(ETHYLMETHYLAMIDE)

## Safety Data Sheet

### Transport by sea

- DOT Vessel Stowage Location : B - (i) The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) "On deck only" on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.
- DOT Vessel Stowage Other : 40 - Stow "clear of living quarters"

### Air transport

- DOT Quantity Limitations Passenger aircraft/rail : 1 L  
(49 CFR 173.27)
- DOT Quantity Limitations Cargo aircraft only (49 : 5 L  
CFR 175.75)

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### Hafnium tetrakis(ethylmethylamide) (352535-01-4)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2. International regulations

#### CANADA

#### Hafnium tetrakis(ethylmethylamide) (352535-01-4)

Listed on the Canadian NDSL (Non-Domestic Substances List)

#### EU-Regulations

#### Hafnium tetrakis(ethylmethylamide) (352535-01-4)

Listed on ELINCS (European List of Notified Chemical Substances)

#### National regulations

No additional information available

### 15.3. US State regulations

No additional information available

## SECTION 16: Other information

Full text of H-phrases::

H225	Highly flammable liquid and vapour
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H335	May cause respiratory irritation

### Hazard Rating

- Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given
- Flammability : 3 Serious Hazard - Materials capable of ignition under almost all normal temperature conditions. Includes flammable liquids with flash points below 73 F and boiling points above 100 F, as well as liquids with flash points between 73 F and 100 F. (Classes IB & IC)
- Physical : 1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.

Date of issue: 01/06/2015      Revision date: 05/25/2018      Version: 1.1

SDS US (GHS HazCom 2012) - Custom

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

# HAFNIUM TETRAKIS(ETHYLMETHYLAMIDE)

## Safety Data Sheet

*The information contained in this document has been gathered from reference materials and/or Gelest, Inc. test data and is to the best knowledge and belief of Gelest, Inc. accurate and reliable. Such information is offered solely for your consideration, investigation and verification. It is not suggested or guaranteed that the hazard precautions or procedures described are the only ones which exist. Gelest, Inc. makes no warranties, express or implied, with respect to the use of such information and assumes no responsibility therefore. Information on this safety data sheet is not intended to constitute a basis for product specifications.*

© 2018 Gelest Inc. Morrisville, PA 19067

