



# SAFETY DATA SHEET

**MATERION**

## 1. Product and company identification

Name of the chemical	Cobalt Hafnium Product	
Other means of identification		
SDS number	320	
Recommended use of the chemical and restrictions on use		
Recommended use	Not available.	
Recommended restrictions	None known.	
Manufacturer/Importer/Supplier/ Distributor information	Materion Electronic Materials	
Address	6070 Parkland Boulevard Mayfield Heights OH 44124 United States	
Telephone	EH&S	1.216.383.4019
E-mail	ehs@materion.com	
Contact person	Theodore Knudson	
Emergency telephone number	See Section 16.	

## 2. Hazards identification

Hazard classification		
Physical hazards	Not classified.	
Health hazards	Sensitization, respiratory	Category 1
	Sensitization, skin	Category 1
	Carcinogenicity	Category 2
	Reproductive toxicity	Category 2
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
Environmental hazards	Hazardous to the aquatic environment, long-term hazard	Category 4

### Label elements

#### Symbols



#### Signal word

Danger

#### Hazard statement

The material as sold in solid form is generally not considered hazardous. However, if the process involves grinding, melting, cutting or any other process that causes a release of dust or fumes, hazardous levels of airborne particulate could be generated. May cause an allergic skin reaction. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation. Suspected of causing cancer. Suspected of damaging fertility or the unborn child. May cause long lasting harmful effects to aquatic life.

#### Precautionary statement

##### Prevention

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.

##### Response

Wash contaminated clothing before reuse. IF exposed or concerned: Get medical advice/attention. If skin irritation or rash occurs: Get medical advice/attention.

##### Storage

Store in a well-ventilated place. Keep container tightly closed. Store locked up.

##### Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

**Other hazards** None known.

**Supplemental information** For further information, please contact the Product Stewardship Department at +1.216.383.4019.

### 3. Composition/information on ingredients

#### Mixture

Chemical name	CAS Number	Concentration (%)
Cobalt	7440-48-4	55 - 99
Hafnium	7440-58-6	1 - 45

### 4. First aid measures

#### First aid measures for different exposure routes

**Inhalation** Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If experiencing respiratory symptoms: Call a poison center or doctor/physician.

**Skin contact** Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions.

**Eye contact** Rinse with water. Get medical attention if irritation develops and persists.

**Ingestion** Rinse mouth. Get medical attention if symptoms occur.

**Most important symptoms and effects** May cause respiratory irritation. Coughing. Difficulty in breathing. May cause an allergic skin reaction. Dermatitis. Rash.

**Personal protection for first-aid responders** IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

**Notes to physician** Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

### 5. Fire-fighting measures

**Extinguishing media** Powder. Dry sand. DRY sand, sodium chloride powder, graphite powder or Met-L-X powder.

**Extinguishing media to avoid** None.

**Specific hazards during fire fighting** During fire, gases hazardous to health may be formed.

**Special fire fighting procedures** Use water spray to cool unopened containers.

**Protection of fire-fighters** Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**General fire hazards** No unusual fire or explosion hazards noted.

**Specific methods** Use standard firefighting procedures and consider the hazards of other involved materials.

### 6. Accidental release measures

**Personal precautions** Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

**Environmental precautions** Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

**Spill cleanup methods** The product is immiscible with water and will spread on the water surface. Prevent product from entering drains. Stop the flow of material, if this is without risk. Following product recovery, flush area with water. Put material in suitable, covered, labeled containers. For waste disposal, see section 13 of the SDS. The product is insoluble in water.

## 7. Handling and storage

### Handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Provide adequate ventilation. Wear appropriate personal protective equipment. Avoid release to the environment. Observe good industrial hygiene practices.

### Storage

Store locked up. Store in tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

## 8. Exposure controls/personal protection

### Exposure limits

#### Taiwan. OELs (Standards of Permissible Exposure Limits at Workplace, Notice No. 58463, as amended)

Components	Type	Value	Form
Cobalt (CAS 7440-48-4)	STEL	0.15 mg/m <sup>3</sup>	Dust and fume.
	TWA	0.05 mg/m <sup>3</sup>	Dust and fume.
Hafnium (CAS 7440-58-6)	TWA	0.5 mg/m <sup>3</sup>	

#### US. ACGIH Threshold Limit Values (TLV)

Components	Type	Value	Form
Cobalt (CAS 7440-48-4)	TWA	0.02 mg/m <sup>3</sup>	Inhalable fraction.
Hafnium (CAS 7440-58-6)	TWA	0.5 mg/m <sup>3</sup>	

### Biological limit values

#### ACGIH Biological Exposure Indices (BEI)

Components	Value	Determinant	Specimen	Sampling Time
Cobalt (CAS 7440-48-4)	15 µg/l	Cobalt	Urine	*

\* - For sampling details, please see the source document.

### Appropriate engineering controls

Good general ventilation 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. General ventilation normally adequate.

### Individual protection measures, such as personal protective equipment

**Eye/face protection** If contact is likely, safety glasses with side shields are recommended.

#### Skin protection

**Hand protection** Wear appropriate chemical resistant gloves.

#### Other

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

**Respiratory protection** In case of insufficient ventilation, wear suitable respiratory equipment.

**Thermal hazards** Wear appropriate thermal protective clothing, when necessary.

### General hygiene considerations

Observe any medical surveillance requirements. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

## 9. Physical and chemical properties

### Appearance

**Physical state** Solid.

**Form** Solid.

**Color** Not available.

**Odor** None.

**Odor threshold** Not applicable.

**Melting point/freezing point** 2723 °F (1495 °C) estimated

**pH** Not applicable.

<b>Boiling point, initial boiling point, and boiling range</b>	5300.6 °F (2927 °C) estimated
<b>Flammability (solid, gas)</b>	Not flammable
<b>Flash point</b>	Not applicable.
<b>Decomposition temperature</b>	Not applicable.
<b>Auto-ignition temperature</b>	68 °F (20 °C) estimated
<b>Upper/lower flammability or explosive limits</b>	
Explosive limit - lower (%)	Not applicable.
Explosive limit - lower (%) temperature	Not applicable.
Explosive limit - upper (%)	Not applicable.
Explosive limit - upper (%) temperature	Not applicable.
<b>Vapor pressure</b>	-0.01 hPa estimated
<b>Vapor density</b>	Not applicable.
<b>Density</b>	13.31 g/cm <sup>3</sup> estimated
<b>Solubility(ies)</b>	
Solubility (water)	Insoluble
<b>Partition coefficient (n-octanol/water)</b>	Not applicable.
<b>Evaporation rate</b>	Not applicable.
<b>Other data</b>	
Explosive properties	Not explosive.
Kinematic viscosity	Not applicable.
Oxidizing properties	Not oxidizing.
Particle size	Not applicable.
Relative density	Not applicable.
Specific gravity	13.31 estimated
Viscosity	Not applicable.

## 10. Stability and reactivity

<b>Reactivity</b>	The product is stable and non-reactive under normal conditions of use, storage and transport.
<b>Stability</b>	Material is stable under normal conditions.
<b>Possibility of hazardous reactions</b>	No dangerous reaction known under conditions of normal use.
<b>Conditions to avoid</b>	Contact with incompatible materials.
<b>Incompatible materials</b>	Strong oxidizing agents. Chlorine.
<b>Hazardous decomposition products</b>	No hazardous decomposition products are known.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Inhalation</b>	May cause irritation to the respiratory system. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Prolonged inhalation may be harmful.
<b>Skin contact</b>	May cause an allergic skin reaction.
<b>Eye contact</b>	Direct contact with eyes may cause temporary irritation.
<b>Ingestion</b>	Expected to be a low ingestion hazard.

**Symptoms** May cause respiratory irritation. Coughing. Difficulty in breathing. May cause an allergic skin reaction. Dermatitis. Rash.

### Information on toxicological effects

<b>Acute toxicity</b>	Not known.
<b>Skin corrosion/irritation</b>	Prolonged skin contact may cause temporary irritation.

<b>Serious eye damage/eye irritation</b>	Direct contact with eyes may cause temporary irritation.
<b>Respiratory or skin sensitization</b>	
<b>ACGIH sensitization</b>	
Cobalt and inorganic compounds, inhalable fraction, as Co (CAS 7440-48-4)	Dermal sensitization
	Respiratory sensitization
<b>Respiratory sensitization</b>	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
<b>Skin sensitization</b>	May cause an allergic skin reaction.
<b>Germ cell mutagenicity</b>	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
<b>Carcinogenicity</b>	Suspected of causing cancer.
<b>ACGIH Carcinogens</b>	
Cobalt (CAS 7440-48-4)	A2 Suspected human carcinogen. A3 Confirmed animal carcinogen with unknown relevance to humans.
<b>IARC Monographs. Overall Evaluation of Carcinogenicity</b>	
Cobalt (CAS 7440-48-4)	2B Possibly carcinogenic to humans.
<b>Reproductive toxicity</b>	Suspected of damaging fertility or the unborn child.
<b>Specific target organ toxicity - single exposure</b>	May cause respiratory irritation.
<b>Specific target organ toxicity - repeated exposure</b>	Not classified.
<b>Aspiration hazard</b>	Not an aspiration hazard.
<b>Chronic effects</b>	Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.

## 12. Ecological information

<b>Ecotoxicity</b>	May cause long lasting harmful effects to aquatic life.
<b>Persistence and degradability</b>	No data is available on the degradability of any ingredients in the mixture.
<b>Bioaccumulation</b>	No data available.
<b>Mobility in soil</b>	The product is immiscible with water and will spread on the water surface.
<b>Other hazardous effects</b>	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

## 13. Disposal considerations

<b>Disposal instructions</b>	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
<b>Residual waste</b>	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
<b>Contaminated packaging</b>	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.
<b>Local disposal regulations</b>	Dispose in accordance with all applicable regulations.

## 14. Transport information

<b>IATA</b>	Not regulated as dangerous goods.
<b>IMDG</b>	Not regulated as dangerous goods.
<b>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b>	Not applicable.

## 15. Regulatory information

### Applicable regulations

Methods and Facilities Standards for the Storage, Clearance and Disposal of Industrial Waste  
Regulations for the Labeling and Hazard Communication of Hazardous Chemicals  
Toxic Chemical Substances Control Act  
Toxic Chemical Substances Labeling and Materials Safety Data Sheets Regulations  
This material safety data sheet was prepared in accordance with the Regulation of Labeling and Hazard Communication of Hazardous Chemicals.

### Methods and Facilities Standards for the Storage, Clearance and Disposal of Industrial Waste

Not listed.

### Regulations Governing Designating and Handling of Priority Management Chemicals

Cobalt (CAS 7440-48-4)

### Categories and Management of Handling for Toxic Chemical Substances

Not listed.

### Standards on Workplace Atmosphere of Dangerous and Hazardous Materials

Cobalt (CAS 7440-48-4)

Listed.

Hafnium (CAS 7440-58-6)

Listed.

### Specified Hazardous Chemicals (Guidelines for Prevention of Danger Posed by Special Hazardous Chemicals (CLA No. 659306)

Cobalt (CAS 7440-48-4)

Class 3 Category C

### GHS Classification List: GHS implementation phase 1, 2 and 3 (CLA No. 0980145063, 0990146707, and 1020146801)

Cobalt (CAS 7440-48-4)

Hafnium (CAS 7440-58-6)

### International regulations

#### Stockholm Convention

Not applicable.

#### Rotterdam Convention

Not applicable.

#### Montreal Protocol

Not applicable.

#### Kyoto protocol

Not applicable.

#### Basel Convention

Not applicable.

### International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Industrial Chemicals (AICIS)	No
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

## 16. Other information

### References

ACGIH  
EPA: AQUIRE database  
NLM: Hazardous Substances Data Base  
Taiwan. Dangerous Materials (Regulations for the Labeling and Hazard Communication of Hazardous Chemicals), as amended  
Taiwan. Industrial Precursor Chemicals (Categories and Regulations Governing Inspection and Declaration of Industrial Precursor Chemicals, MOEA Decree No. 87, as amended)  
Taiwan. OELs (Standards of Permissible Exposure Limits at Workplace), as amended  
Taiwan. Toxic Chemical Substances (TCS) (List of Toxic Chemical Substances announced by the Environmental Protection Administration)  
Taiwan. Toxic Materials (Toxic and Concerned Chemical Substances Control Act)  
US. IARC Monographs on Occupational Exposures to Chemical Agents

### Issued by

Not available.

### Further information

Transportation Emergency  
Call Chemtrec at:  
US: 800.424.9300  
International: 703.741.5970  
Spain: 900.868.538  
Switzerland: 0800.564.402  
Chemtrec's toll free, mobile-enabled number in Germany – 0800 1817059  
South Korea Toll-free Number – 080-880-0468

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