



PRODUCT INFORMATION SHEET

MATERION

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name or designation of the mixture Copper Hafnium Product
Synonyms None.
Document number 351
Version number 01

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

Identified uses Not available.
Uses advised against None known.

1.3. Details of the supplier of the product information sheet

Supplier

Company name Materion Advanced Materials Group
Address 42 Mt. Ebo Road South
Brewster, NY 10509
United States
Division
Telephone Supplier Phone 1+845.279.0900
e-mail Not available.
Contact person Not available.

1.4. Emergency telephone number Chemtrec 1+703.527.3887

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Directive 67/548/EEC or 1999/45/EC as amended

Classification F;R11, N;R50/53

Classification according to Regulation (EC) No 1272/2008 as amended

Environmental hazards

Hazardous to the aquatic environment, acute aquatic hazard Category 1 H400 - Very toxic to aquatic life.
Hazardous to the aquatic environment, long-term aquatic hazard Category 1 H410 - Very toxic to aquatic life with long lasting effects.

Hazard summary

Physical hazards Highly flammable.
Health hazards Not classified for health hazards.
Environmental hazards Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Specific hazards Not available.
Main symptoms Not available.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains: Hafnium, RM Copper - Solid
Hazard pictograms None.
Signal word Warning
Hazard statements
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention
P273 Avoid release to the environment.

Response

P391 Collect spillage.

Storage

Not available.

Disposal

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Supplemental label information

15,05 % of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 15,05 % of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.

2.3. Other hazards

None known.

SECTION 3: Composition/information on ingredients**3.2. Mixtures****General information**

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
RM Copper - Solid	70 - < 99,9	7440-50-8 231-159-6	-	-	M=100
Classification:	DSD: N;R50/53				
	CLP: Aquatic Acute 1;H400, Aquatic Chronic 1;H410				
Hafnium	0,1 - < 30	7440-58-6 231-166-4	-	-	
Classification:	DSD: F;R11				
	CLP: Flam. Sol. 2;H228				

SECTION 4: First aid measures**General information** Not available.**4.1. Description of first aid measures****Inhalation** Not available.**Skin contact** Not available.**Eye contact** Not available.**Ingestion** Not available.**4.2. Most important symptoms and effects, both acute and delayed** Not available.**4.3. Indication of any immediate medical attention and special treatment needed** Not available.**SECTION 5: Firefighting measures****General fire hazards** Not available.**5.1. Extinguishing media****Suitable extinguishing media** Not available.**Unsuitable extinguishing media** Dry Sand, Graphite Powder, Dry Sodium Chloride Based Extinguishers**5.2. Special hazards arising from the substance or mixture** Not available.**5.3. Advice for firefighters****Special protective equipment for firefighters** Not available.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel Not available.

For emergency responders Not available.

6.2. Environmental precautions Not available.

6.3. Methods and material for containment and cleaning up Not available.

6.4. Reference to other sections Not available.

SECTION 7: Handling and storage

7.1. Precautions for safe handling Not available.

7.2. Conditions for safe storage, including any incompatibilities Not available.

7.3. Specific end use(s) Not available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

Austria. MAK List, OEL Ordinance (GwV), BGBl. II, no. 184/2001

Components	Type	Value	Form
Hafnium (CAS 7440-58-6)	MAK	0,5 mg/m ³	Inhalable fraction.
	STEL	5 mg/m ³	Inhalable fraction.
RM Copper - Solid (CAS 7440-50-8)	MAK	1 mg/m ³	Inhalable fraction.
		0,1 mg/m ³	Fume and respirable dust.
	STEL	4 mg/m ³	Inhalable fraction.
		0,4 mg/m ³	Fume and respirable dust.

Belgium. Exposure Limit Values.

Components	Type	Value	Form
Hafnium (CAS 7440-58-6)	TWA	0,5 mg/m ³	
RM Copper - Solid (CAS 7440-50-8)	TWA	1 mg/m ³	Dust and mist.
		0,2 mg/m ³	Fume.

Bulgaria. OELs. Regulation No 13 on protection of workers against risks of exposure to chemical agents at work

Components	Type	Value
RM Copper - Solid (CAS 7440-50-8)	TWA	0,1 mg/m ³

Croatia. Dangerous Substance Exposure Limit Values in the Workplace (ELVs), Annexes 1 and 2, Narodne Novine, 13/09

Components	Type	Value	Form
RM Copper - Solid (CAS 7440-50-8)	MAC	0,21 mg/m ³	Dust and fume.
	STEL	2 mg/m ³	Dust and fume.

Cyprus. OELs. Control of factory atmosphere and dangerous substances in factories regulation, PI 311/73, as amended.

Components	Type	Value	Form
RM Copper - Solid (CAS 7440-50-8)	TWA	0,2 mg/m ³	Fume.

Czech Republic. OELs. Government Decree 361

Components	Type	Value	Form
RM Copper - Solid (CAS 7440-50-8)	Ceiling	2 mg/m ³	Dust.
		0,2 mg/m ³	Fume.

Czech Republic. OELs. Government Decree 361

Components	Type	Value	Form
	TWA	1 mg/m ³ 0,1 mg/m ³	Dust. Fume.

Denmark. Exposure Limit Values Components

Components	Type	Value	Form
Hafnium (CAS 7440-58-6)	TLV	0,5 mg/m ³	Dust.
RM Copper - Solid (CAS 7440-50-8)	TLV	1 mg/m ³ 0,1 mg/m ³	Dust. Fume.

Estonia. OELs. Occupational Exposure Limits of Hazardous Substances. (Annex of Regulation No. 293 of 18 September 2001)

Components	Type	Value	Form
RM Copper - Solid (CAS 7440-50-8)	TWA	1 mg/m ³ 0,2 mg/m ³	Total dust. Respirable dust.

Finland. Workplace Exposure Limits Components

Components	Type	Value	Form
Hafnium (CAS 7440-58-6)	TWA	0,5 mg/m ³	
RM Copper - Solid (CAS 7440-50-8)	TWA	1 mg/m ³ 0,1 mg/m ³	Respirable dust and/or fume.

France. Threshold Limit Values (VLEP) for Occupational Exposure to Chemicals in France, INRS ED 984

Components	Type	Value	Form
Hafnium (CAS 7440-58-6)	VME	0,5 mg/m ³	
RM Copper - Solid (CAS 7440-50-8)	VLE	2 mg/m ³	Dust.
	VME	1 mg/m ³ 0,2 mg/m ³	Dust. Fume.

Germany. DFG MAK List (advisory OELs). Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (DFG)

Components	Type	Value	Form
RM Copper - Solid (CAS 7440-50-8)	TWA	0,01 mg/m ³	Respirable fraction.

Greece. OELs (Decree No. 90/1999, as amended)

Components	Type	Value	Form
Hafnium (CAS 7440-58-6)	STEL	1,5 mg/m ³	
	TWA	0,5 mg/m ³	
RM Copper - Solid (CAS 7440-50-8)	STEL	2 mg/m ³	Dust.
	TWA	1 mg/m ³ 0,2 mg/m ³	Dust. Fume.

Hungary. OELs. Joint Decree on Chemical Safety of Workplaces

Components	Type	Value	Form
RM Copper - Solid (CAS 7440-50-8)	STEL	4 mg/m ³	
		0,4 mg/m ³	Smoke.
	TWA	1 mg/m ³ 0,1 mg/m ³	Smoke.

Iceland. OELs. Regulation 154/1999 on occupational exposure limits

Components	Type	Value	Form
Hafnium (CAS 7440-58-6)	TWA	0,5 mg/m ³	Dust.
RM Copper - Solid (CAS 7440-50-8)	TWA	1 mg/m ³ 0,1 mg/m ³	Total dust. Respirable dust.

Ireland. Occupational Exposure Limits Components

Components	Type	Value	Form
Hafnium (CAS 7440-58-6)	STEL	1,5 mg/m ³	

Ireland. Occupational Exposure Limits Components

Components	Type	Value	Form
RM Copper - Solid (CAS 7440-50-8)	TWA	0,5 mg/m ³	
	STEL	2 mg/m ³	Dust and mist.
	TWA	1 mg/m ³ 0,2 mg/m ³	Dust and mist. Fume.

Italy. Occupational Exposure Limits Components

Components	Type	Value
Hafnium (CAS 7440-58-6)	TWA	0,5 mg/m ³

Latvia. OELs. Occupational exposure limit values of chemical substances in work environment Components

Components	Type	Value
RM Copper - Solid (CAS 7440-50-8)	STEL	1 mg/m ³
	TWA	0,5 mg/m ³

Lithuania. OELs. Limit Values for Chemical Substances, General Requirements Components

Components	Type	Value	Form
RM Copper - Solid (CAS 7440-50-8)	TWA	1 mg/m ³	Inhalable fraction.
		0,2 mg/m ³	Respirable fraction.

Netherlands. OELs (binding) Components

Components	Type	Value	Form
RM Copper - Solid (CAS 7440-50-8)	TWA	0,1 mg/m ³	Inhalable fraction.

Norway. Administrative Norms for Contaminants in the Workplace Components

Components	Type	Value	Form
Hafnium (CAS 7440-58-6)	TLV	0,5 mg/m ³	
RM Copper - Solid (CAS 7440-50-8)	TLV	1 mg/m ³	Dust.
		0,1 mg/m ³	Fume.

Poland. MACs. Minister of Labour and Social Policy Regarding Maximum Allowable Concentrations and Intensities in Working Environment Components

Components	Type	Value
Hafnium (CAS 7440-58-6)	TWA	0,5 mg/m ³
RM Copper - Solid (CAS 7440-50-8)	TWA	0,2 mg/m ³

Portugal. VLEs. Norm on occupational exposure to chemical agents (NP 1796) Components

Components	Type	Value	Form
Hafnium (CAS 7440-58-6) RM Copper - Solid (CAS 7440-50-8)	TWA	0,5 mg/m ³	
		1 mg/m ³	Dust and mist.
		0,2 mg/m ³	Fume.

Romania. OELs. Protection of workers from exposure to chemical agents at the workplace Components

Components	Type	Value	Form
Hafnium (CAS 7440-58-6) RM Copper - Solid (CAS 7440-50-8)	STEL	0,5 mg/m ³	
		0,2 mg/m ³	
	TWA	1,5 mg/m ³	Dust.
		0,2 mg/m ³	Fume.
		0,5 mg/m ³	Dust.

Slovakia. OELs. Regulation No. 300/2007 concerning protection of health in work with chemical agents Components

Components	Type	Value	Form
RM Copper - Solid (CAS 7440-50-8)	TWA	1 mg/m ³	Inhalable fraction.
		0,2 mg/m ³	Respirable fume.

Slovenia. OELs. Regulations concerning protection of workers against risks due to exposure to chemicals while working (Official Gazette of the Republic of Slovenia)

Components	Type	Value	Form
Hafnium (CAS 7440-58-6)	TWA	0,5 mg/m ³	Inhalable fraction.
RM Copper - Solid (CAS 7440-50-8)	TWA	1 mg/m ³	Inhalable fraction.
		0,1 mg/m ³	Respirable fume.

Spain. Occupational Exposure Limits

Components	Type	Value	Form
Hafnium (CAS 7440-58-6)	TWA	0,5 mg/m ³	
RM Copper - Solid (CAS 7440-50-8)	TWA	1 mg/m ³	Dust and mist.
		0,2 mg/m ³	Fume.

Sweden. Occupational Exposure Limit Values

Components	Type	Value	Form
RM Copper - Solid (CAS 7440-50-8)	TWA	1 mg/m ³	Total dust.
		0,2 mg/m ³	Respirable dust.

Switzerland. SUVA Grenzwerte am Arbeitsplatz

Components	Type	Value	Form
Hafnium (CAS 7440-58-6)	TWA	0,5 mg/m ³	Inhalable dust.
RM Copper - Solid (CAS 7440-50-8)	STEL	0,2 mg/m ³	Inhalable dust.
	TWA	0,1 mg/m ³	Inhalable dust.

UK. EH40 Workplace Exposure Limits (WELs)

Components	Type	Value	Form
RM Copper - Solid (CAS 7440-50-8)	STEL	2 mg/m ³	Inhalable dusts and mists.
	TWA	1 mg/m ³	Inhalable dusts and mists.
		0,2 mg/m ³	Fume.

Biological limit values No biological exposure limits noted for the ingredient(s).

Recommended monitoring procedures Not available.

Derived no-effect level (DNEL) Not available.

Predicted no effect concentrations (PNECs) Not available.

8.2. Exposure controls

Appropriate engineering controls Not available.

Individual protection measures, such as personal protective equipment

Eye/face protection Not available.

Skin protection

- **Hand protection** Not available.

- **Other** Not available.

Respiratory protection Not available.

Thermal hazards Not available.

Hygiene measures Not available.

Environmental exposure controls Not available.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

Physical state Solid.

Form Not available.

Colour Not available.

Odour Not applicable.

Odour threshold	Not available.
pH	Not available.
Melting point/freezing point	1083 °C (1981,4 °F) estimated
Initial boiling point and boiling range	2595 °C (4703 °F) estimated
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Vapour pressure	0,00001 hPa estimated
Vapour density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Solubility (other)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	20 °C (68 °F) estimated
Decomposition temperature	Not available.
Viscosity	Not available.
Explosive properties	Not available.
Oxidizing properties	Not available.
9.2. Other information	
Density	9,60 g/cm3 estimated
Specific gravity	9,6 estimated

SECTION 10: Stability and reactivity

10.1. Reactivity	Not available.
10.2. Chemical stability	Not available.
10.3. Possibility of hazardous reactions	Not available.
10.4. Conditions to avoid	Not available.
10.5. Incompatible materials	Not available.
10.6. Hazardous decomposition products	Not available.

SECTION 11: Toxicological information

General information	Not available.
Information on likely routes of exposure	
Inhalation	Not available.
Skin contact	Not available.
Eye contact	Not available.
Ingestion	Not available.
Symptoms	Not available.
11.1. Information on toxicological effects	
Acute toxicity	No data available.
Skin corrosion/irritation	Not available.
Serious eye damage/eye irritation	Not available.
Respiratory sensitisation	Not available.
Skin sensitisation	Not available.
Germ cell mutagenicity	Not available.

Carcinogenicity	Not available.
Reproductive toxicity	Not available.
Specific target organ toxicity - single exposure	Not available.
Specific target organ toxicity - repeated exposure	Not available.
Aspiration hazard	Not available.
Mixture versus substance information	Not available.
Other information	Not available.

SECTION 12: Ecological information

12.1. Toxicity

Components	Species	Test results
RM Copper - Solid (CAS 7440-50-8)		
Aquatic		
Crustacea	EC50	Water flea (Daphnia magna) 0,036 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas) 0,0319 - 0,0544 mg/l, 96 hours

12.2. Persistence and degradability Not available.

12.3. Bioaccumulative potential Not available.

Partition coefficient n-octanol/water (log Kow) Not available.

Bioconcentration factor (BCF) Not available.

12.4. Mobility in soil Not available.

12.5. Results of PBT and vPvB assessment Not a PBT or vPvB substance or mixture.

12.6. Other adverse effects Not available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste Not available.

Contaminated packaging Not available.

EU waste code Not available.

SECTION 14: Transport information

ADR

14.1. UN number UN3178

14.2. UN proper shipping name Flammable solid, inorganic, n.o.s. (Hafnium)

14.3. Transport hazard class(es)

Class 4.1

Subsidiary risk -

Label(s) 4.1

Hazard No. (ADR) 40

Tunnel restriction code E

14.4. Packing group III

14.5. Environmental hazards Yes

14.6. Special precautions for user Not available.

RID

14.1. UN number UN3178

14.2. UN proper shipping name Flammable solid, inorganic, n.o.s. (Hafnium)

14.3. Transport hazard class(es)

Class 4.1

Subsidiary risk	-
Label(s)	4.1
14.4. Packing group	III
14.5. Environmental hazards	Yes
14.6. Special precautions for user	Not available.

ADN

14.1. UN number	UN3178
14.2. UN proper shipping name	Flammable Solid, N.o.s. (Hafnium)
14.3. Transport hazard class(es)	
Class	4.1
Subsidiary risk	-
Label(s)	4.1
14.4. Packing group	III
14.5. Environmental hazards	Yes
14.6. Special precautions for user	Not available.

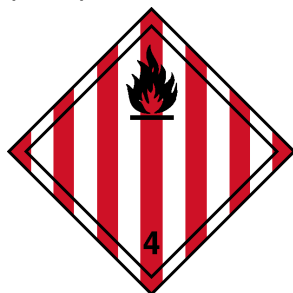
IATA

Not regulated as dangerous goods.

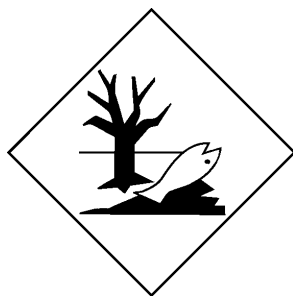
IMDG

Not regulated as dangerous goods.

ADN; ADR; RID



Marine pollutant



SECTION 15: Regulatory information

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

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I, as amended
Not listed.

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex II, as amended
Not listed.

Regulation (EC) No. 850/2004 on persistent organic pollutants, Annex I
Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1
Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2
Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3
Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

RM Copper - Solid (CAS 7440-50-8)

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended

Not listed.

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006 Annex XVII Substances subject to restriction on marketing and use

Not regulated.

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended

Not listed.

Directive 92/85/EEC: on the safety and health of pregnant workers and workers who have recently given birth or are breastfeeding, as amended

Not listed.

Other EU regulations

Directive 2012/18/EU on major accident hazards involving dangerous substances

Not listed.

Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work, as amended

Not listed.

Directive 94/33/EC on the protection of young people at work, as amended

Not listed.

National regulations

Not available.

15.2. Chemical safety assessment

Not available.

SECTION 16: Other information

List of abbreviations

Not available.

References

Not available.

Information on evaluation method leading to the classification of mixture

Not available.

Full text of any statements or R-phrases and H-statements under Sections 2 to 15

R11 Highly flammable.

R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

H228 Flammable solid.

H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

Revision information

None.

Training information

Not available.