



# SAFETY DATA SHEET

**MATERION**

Version #: 05

Issue date: 07-October-2013

Revision date: 11-June-2024

Supersedes date: 15-January-2018

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

<b>Registration number</b>	-
<b>Synonyms</b>	RUTHENIUM * Ruthium * RUTHENIUM, POWDER
<b>Materion Code</b>	1ZG
<b>1.1. Product identifier</b>	
<b>Name of the substance</b>	Ruthenium powder
<b>Identification number</b>	231-127-1 (EC number)
<b>1.2. Relevant identified uses of the substance or mixture and uses advised against</b>	
<b>Identified uses</b>	Not available.
<b>Uses advised against</b>	None known.
<b>1.3. Details of the supplier of the safety data sheet</b>	
<b>Supplier</b>	
<b>Company name</b>	Materion Electronic Materials
<b>Address</b>	6070 Parkland Blvd Mayfield Heights, OH 44124 United States
<b>Division</b>	
<b>Telephone</b>	1.216.383.4019
<b>e-mail</b>	Materion-PS@materion.com
<b>Contact person</b>	Product Stewardship Director
<b>1.4. Emergency telephone number</b>	
<b>Document number</b>	1ZG

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

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

##### Physical hazards

Flammable solids Category 2

### 2.2. Label elements

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

**Contains:** Ruthenium

##### Hazard pictograms



**Signal word**

None.

##### Hazard statements

The substance does not meet the criteria for classification.

#### Precautionary statements

##### Prevention

P241 Use explosion-proof electrical/ventilating/lighting equipment.

##### Response

P332 + P313 If skin irritation occurs: Get medical advice/attention.

P337 + P313 If eye irritation persists: Get medical advice/attention.

##### Storage

P403 + P233  
P405

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.

#### Supplemental label information

For further information, please contact the Product Stewardship Department at +1.800.862.4118.

#### 2.3. Other hazards

The Safety Information Sheet Chemicals of hazardous chemical can be obtained through phone, email or on the company website. This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII. The substance is not included in the list established in accordance with REACH Article 59(1) for having endocrine disrupting properties.

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

#### General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Ruthenium	100	7440-18-8 231-127-1	-	-	
Classification: -					

#### List of abbreviations and symbols that may be used above

DSD: Directive 67/548/EEC.

CLP: Regulation No. 1272/2008.

ATE: Acute toxicity estimate.

M: M-factor

vPvB: very persistent and very bioaccumulative substance.

PBT: persistent, bioaccumulative and toxic substance.

#: This substance has been assigned Community workplace exposure limit(s).

#: This substance has been assigned Union workplace exposure limit(s).

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. \*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

#### Composition comments

The full text for all H-statements is displayed in section 16. The full text for all R- and H-phrases is displayed in section 16.

## SECTION 4: First aid measures

#### General information

IF exposed or concerned: Get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

### 4.1. Description of first aid measures

#### Inhalation

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTRE or doctor/physician if you feel unwell.

#### Skin contact

Take off immediately all contaminated clothing. Wash off with soap and plenty of water. If skin irritation occurs: Get medical advice/attention.

#### Eye contact

Do not rub eyes. Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

#### Ingestion

Rinse mouth. Call a POISON CENTRE or doctor/physician if you feel unwell.

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

Irritation of eyes and mucous membranes.

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

Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.

## SECTION 5: Firefighting measures

#### General fire hazards

Flammable solid. No unusual fire or explosion hazards noted.

### 5.1. Extinguishing media

#### Suitable extinguishing media

Water fog. Foam. Dry chemical powder. Carbon dioxide (CO<sub>2</sub>).

#### Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire.

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

During fire, gases hazardous to health may be formed.

### 5.3. Advice for firefighters

#### Special protective equipment for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Wear suitable protective equipment.

#### Special firefighting procedures

In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. ALWAYS stay away from tanks engulfed in flame. Move containers from fire area if you can do so without risk. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tanks due to fire. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out.

#### Specific methods

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

## SECTION 6: Accidental release measures

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

#### For non-emergency personnel

Wear appropriate personal protective equipment.

#### For emergency responders

Keep unnecessary personnel away. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. Use personal protection recommended in Section 8 of the SDS.

### 6.2. Environmental precautions

Contact local authorities in case of spillage to drain/aquatic environment. Avoid discharge into drains, water courses or onto the ground.

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

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Prevent entry into waterways, sewer, basements or confined areas. Stop the flow of material, if this is without risk.

Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water.

Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal.

Never return spills to original containers for re-use.

For personal protection, see section 8 of the SDS. For waste disposal, see section 13.

### 6.4. Reference to other sections

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. May be ignited by open flame. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. Avoid contact with eyes. Avoid contact with skin. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

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

Store locked up. Keep away from heat, sparks and open flame. This material can accumulate static charge which may cause spark and become an ignition source. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS).

### 7.3. Specific end use(s)

Observe industrial sector guidance on best practices.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### Occupational exposure limits

No exposure limits noted for ingredient(s).

#### Biological limit values

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

#### Recommended monitoring procedures

Follow standard monitoring procedures.

#### Derived no effect levels (DNELs)

Not available.

#### Predicted no effect concentrations (PNECs)

Not available.

### 8.2. Exposure controls

#### Appropriate engineering controls

Explosion-proof general and local exhaust ventilation. Provide eyewash station.

## Individual protection measures, such as personal protective equipment

<b>General information</b>	Use personal protective equipment as required. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment. Eye wash fountain is recommended.
<b>Eye/face protection</b>	Wear eye/face protection. Wear safety glasses with side shields (or goggles).
<b>Skin protection</b>	
- <b>Hand protection</b>	Wear appropriate chemical resistant gloves.
- <b>Other</b>	Wear suitable protective clothing. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment. Wear protective gloves.
<b>Respiratory protection</b>	In case of insufficient ventilation, wear suitable respiratory equipment.
<b>Thermal hazards</b>	Wear appropriate thermal protective clothing, when necessary.
<b>Hygiene measures</b>	When using do not smoke. Avoid contact with eyes. Avoid contact with skin. Keep away from food and drink. 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.
<b>Environmental exposure controls</b>	Environmental manager must be informed of all major releases. Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels.

## SECTION 9: Physical and chemical properties

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

<b>Physical state</b>	Solid.
<b>Form</b>	Solid.
<b>Colour</b>	Not available.
<b>Odour</b>	Not available.
<b>Melting point/freezing point</b>	Not available.
<b>Boiling point or initial boiling point and boiling range</b>	Not available.
<b>Flammability</b>	Flammable solid.
<b>Upper/lower flammability or explosive limits</b>	
<b>Explosive limit - lower (%)</b>	Not available.
<b>Explosive limit – upper (%)</b>	Not available.
<b>Flash point</b>	Not available.
<b>Auto-ignition temperature</b>	Not available.
<b>Decomposition temperature</b>	Not available.
<b>pH</b>	Not available.
<b>Kinematic viscosity</b>	Not available.
<b>Solubility</b>	
<b>Solubility (water)</b>	Not available.
<b>Partition coefficient (n-octanol/water) (log value)</b>	Not available.
<b>Vapour pressure</b>	<0,0000001 kPa (25 °C (77 °F))
<b>Density and/or relative density</b>	Not available.
<b>Vapour density</b>	Not available.
<b>Particle characteristics</b>	Not available.

### 9.2. Other information

<b>9.2.1. Information with regard to physical hazard classes</b>	No relevant additional information available.
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### 9.2.2. Other safety characteristics

<b>Molecular formula</b>	Ru
<b>Molecular weight</b>	101,07 g/mol

## SECTION 10: Stability and reactivity

<b>10.1. Reactivity</b>	Not available.
<b>10.2. Chemical stability</b>	Risk of ignition.
<b>10.3. Possibility of hazardous reactions</b>	No dangerous reaction known under conditions of normal use.
<b>10.4. Conditions to avoid</b>	Heat, flames and sparks. Contact with incompatible materials. None under normal conditions.
<b>10.5. Incompatible materials</b>	Strong oxidising agents.
<b>10.6. Hazardous decomposition products</b>	No hazardous decomposition products are known.

## SECTION 11: Toxicological information

**General information** Occupational exposure to the substance or mixture may cause adverse effects.

### Information on likely routes of exposure

<b>Inhalation</b>	May cause irritation to the respiratory system.
<b>Skin contact</b>	Causes skin irritation.
<b>Eye contact</b>	Causes serious eye irritation.
<b>Ingestion</b>	Due to lack of data the classification is not possible.

**Symptoms** Irritant effects.

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

<b>Acute toxicity</b>	May cause respiratory irritation. Due to partial or complete lack of data the classification is not possible.
<b>Skin corrosion/irritation</b>	Causes skin irritation.
<b>Serious eye damage/eye irritation</b>	Causes serious eye irritation.
<b>Respiratory sensitisation</b>	Due to partial or complete lack of data the classification is not possible.
<b>Skin sensitisation</b>	Due to partial or complete lack of data the classification is not possible.
<b>Germ cell mutagenicity</b>	Due to partial or complete lack of data the classification is not possible.
<b>Carcinogenicity</b>	Suspected of causing cancer.
<b>Reproductive toxicity</b>	Due to partial or complete lack of data the classification is not possible.
<b>Specific target organ toxicity - single exposure</b>	Respiratory tract irritation.
<b>Specific target organ toxicity - repeated exposure</b>	Due to partial or complete lack of data the classification is not possible.
<b>Aspiration hazard</b>	Due to partial or complete lack of data the classification is not possible.
<b>Mixture versus substance information</b>	No information available.

### 11.2. Information on other hazards

<b>Endocrine disrupting properties</b>	This substance does not have endocrine disrupting properties with respect to human health, as it does not meet the assessment criteria laid out in Regulations (EC) No 1907/2006, (EU) No 2017/2100 and (EU) 2018/605.
<b>Other information</b>	Not available.

## SECTION 12: Ecological information

<b>12.1. Toxicity</b>	Due to partial or complete lack of data the classification for hazardous to the aquatic environment, is not possible.
<b>12.2. Persistence and degradability</b>	No data is available on the degradability of this product.
<b>12.3. Bioaccumulative potential</b>	No data available.
<b>Partition coefficient n-octanol/water (log Kow)</b>	Not available.
<b>Bioconcentration factor (BCF)</b>	Not available.
<b>12.4. Mobility in soil</b>	No data available.
<b>12.5. Results of PBT and vPvB assessment</b>	This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII.

<b>12.6. Endocrine disrupting properties</b>	This substance does not have endocrine disrupting properties with respect to the environment, as it does not meet the assessment criteria laid out in Regulations (EC) No 1907/2006, (EU) No 2017/2100 and (EU) 2018/605.
<b>12.7. Other adverse 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.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

<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). Avoid discharge into water courses or onto the ground.
<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>EU waste code</b>	The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
<b>Disposal methods/information</b>	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not discharge into drains, water courses or onto the ground. 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>Special precautions</b>	Dispose in accordance with all applicable regulations.

## SECTION 14: Transport information

### ADR

<b>14.1. UN number</b>	UN3089
<b>14.2. UN proper shipping name</b>	Metal powders, flammable, n.o.s.
<b>14.3. Transport hazard class(es)</b>	
Class	4.1
Subsidiary risk	-
Label(s)	4.1
Hazard No. (ADR)	Not assigned.
Tunnel restriction code	Not assigned.
<b>14.4. Packing group</b>	II
<b>14.5. Environmental hazards</b>	No.
<b>14.6. Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling.

### RID

<b>14.1. UN number</b>	UN3089
<b>14.2. UN proper shipping name</b>	Metal powders, flammable, n.o.s.
<b>14.3. Transport hazard class(es)</b>	
Class	4.1
Subsidiary risk	-
Label(s)	4.1
<b>14.4. Packing group</b>	II
<b>14.5. Environmental hazards</b>	No.
<b>14.6. Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling.

### ADN

<b>14.1. UN number</b>	UN3089
<b>14.2. UN proper shipping name</b>	Metal powders, flammable, n.o.s.
<b>14.3. Transport hazard class(es)</b>	
Class	4.1
Subsidiary risk	-
Label(s)	4.1
<b>14.4. Packing group</b>	II
<b>14.5. Environmental hazards</b>	No.

**14.6. Special precautions for user** Read safety instructions, SDS and emergency procedures before handling.

**IATA**

**14.1. UN number** UN3089

**14.2. UN proper shipping name** Metal powders, flammable, n.o.s.

**14.3. Transport hazard class(es)**

**Class** 4.1

**Subsidiary risk** -

**Label(s)** 4.1

**14.4. Packing group** II

**14.5. Environmental hazards** No.

**14.6. Special precautions for user** Read safety instructions, SDS and emergency procedures before handling.

**IMDG**

**14.1. UN number** UN3089

**14.2. UN proper shipping name** Metal powders, flammable, n.o.s.

**14.3. Transport hazard class(es)**

**Class** 4.1

**Subsidiary risk** -

**Label(s)** 4.1

**14.4. Packing group** II

**14.5. Environmental hazards**

**Marine pollutant** No.

**EmS** Not assigned.

**14.6. Special precautions for user** Read safety instructions, SDS and emergency procedures before handling.

**ADN; ADR; IATA; IMDG; RID**



## 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 and II, as amended**

Not listed.

**Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended**

Not listed.

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

Not listed.

Not listed.

#### **Authorisations**

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

Not listed.

#### **Restrictions on use**

**Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use, as amended - Conditions of restriction given for the associated entry number should be considered**

Not listed.

**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.

**Regulation 2019/1148 on Marketing and Use of Explosive Precursors, Annex I, as amended**

Not listed.

**Regulation 2019/1148 on Marketing and Use of Explosive Precursors, Annex II, as amended**

Not listed.

#### **Other regulations**

This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006. The product is classified and labelled in accordance with EC directives or respective national laws. The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended.

#### **National regulations**

Follow national regulation for work with chemical agents.

Follow national regulation for work with chemical agents in accordance with Directive 98/24/EC, as amended.

#### **France regulations**

**France INRS Table of Occupational Diseases**

Not regulated.

#### **15.2. Chemical safety assessment**

No Chemical Safety Assessment has been carried out.

### **SECTION 16: Other information**

#### **List of abbreviations**

ADN: European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways.  
ADR: Agreement concerning the International Carriage of Dangerous Goods by Road.  
AGW: Occupational threshold limit value (Arbeitsplatzgrenzwert – Germany).  
CAS: Chemical Abstract Service.  
CEN: European Committee for Standardization.  
IATA: International Air Transport Association.  
IBC Code: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.  
IMDG: International Maritime Dangerous Goods.  
MAC: Maximum Allowed Concentration.  
MARPOL: International Convention for the Prevention of Pollution from Ships.  
PBT: Persistent, bioaccumulative and toxic.  
RID: Regulations concerning the International Carriage of Dangerous Goods by Rail.  
STEL: Short term exposure limit.  
TLV: Threshold Limit Value.  
TWA: Time Weighted Average.  
VLE: Exposure Limit Value.  
VME: Exposure Average Value.  
vPvB: Very persistent and very bioaccumulative.

#### **References**

ACGIH  
EPA: AQUIRE database  
NLM: Hazardous Substances Data Base  
US. IARC Monographs on Occupational Exposures to Chemical Agents

#### **Information on evaluation method leading to the classification of mixture**

Not applicable.

#### **Full text of any statements, which are not written out in full under sections 2 to 15**

None.



**Revision information****Training information****Further information**

This document has undergone significant changes and should be reviewed in its entirety.

Follow training instructions when handling this material.

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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