



# MATERIAL SAFETY DATA SHEET

## MATERION

### 1. Chemical product and company identification

**A. Product name** Iridium Ruthenium Targets

**Other means of identification**

SDS number G07

**B. Recommended use and Limitations on use**

**Recommended use** Industrial uses: Uses of substances as such or in preparations at industrial sites

**Limitations on use** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

**C. Supplier information**

**Company name** Materion Advanced Materials Germany GmbH

**Address**  
Borsigstrasse 10  
Alzenau 63755  
Germany

**Email** Materion.Germany@materion.com

**Contact person** Hermann Schmiing

**Emergency telephone number** 49.60.23.91.82.0

**MSDS number** G07

### 2. Hazards identification

**A. Hazard category/Classification**

**Physical hazards** Not classified.

**Health hazards**

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2
Carcinogenicity	Category 2
Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation

**Environmental hazards** Not classified.

**B. Warning label items including precautionary statement**

• **Pictogram**



• **Signal word** Warning

• **Hazard statement**

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.

• **Precautionary statement**

**Prevention**

	Observe good industrial hygiene practices.
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P264	Wash thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

**Response**

Wash hands after handling.

P302 + P352	IF ON SKIN: Wash with plenty of water.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/attention.
P332 + P313	If skin irritation occurs: Get medical advice/attention.
P337 + P313	If eye irritation persists: Get medical advice/attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.

#### Storage

	Store away from incompatible materials.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

#### Disposal

	Dispose of waste and residues in accordance with local authority requirements.
P501	Dispose of contents/container (in accordance with related regulations).

**C. Other hazards not included in the hazard category criteria (e.g. dust explosion hazard)** None known.

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

### 3. Composition/information on ingredients

Chemical identity	Common and alternative names	CAS number	ID number	Content in percent (%)
Iridium		7439-88-5	KE-21046	30 - 70
Ruthenium		7440-18-8	KE-30666	30 - 70

### 4. First aid measures

<b>A. In case of eye contact</b>	Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
<b>B. In case of skin contact</b>	Remove contaminated clothing. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse. Wash with soap and water.
<b>C. In case of inhalation</b>	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.
<b>D. In case of swallowing</b>	Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately.
<b>E. Note to physician</b>	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
<b>Most important symptoms/effects, acute and delayed</b>	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Skin irritation. May cause redness and pain. None known.
<b>General advice</b>	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.

### 5. Fire-fighting measures

<b>A. Suitable (and unsuitable) extinguishing media</b>	
<b>Suitable extinguishing media</b>	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO <sub>2</sub> ).
<b>Unsuitable extinguishing media</b>	Do not use water as an extinguisher.
<b>B. Specific hazards arising from the chemical (example: hazardous combustion products)</b>	This product is not flammable.
<b>C. Specific methods of fire-fighting</b>	
<b>Special protective equipment for firefighters</b>	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

<b>Special fire fighting procedures</b>	Move containers from fire area if you can do so without risk.
<b>General fire hazards</b>	No unusual fire or explosion hazards noted.
<b>Specific methods</b>	Use standard firefighting procedures and consider the hazards of other involved materials.
<b>6. Accidental release measures</b>	
<b>A. Personal precautions, protective equipment and emergency measures</b>	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 MSDS. In solid form this material poses no special clean-up problems.
<b>B. Environmental precautions</b>	Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.
<b>C. Methods and materials for containment and cleaning up</b>	<p>The product is immiscible with water and will spread on the water surface. Clean up in accordance with all applicable regulations.</p> <p>Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.</p> <p>Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.</p> <p>Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers. For waste disposal, see section 13 of the MSDS.</p>
<b>7. Handling and storage</b>	
<b>A. Precautions for safe handling</b>	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid contact with eyes, skin, and clothing. Should be handled in closed systems, if possible. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
<b>B. Conditions for safe storage (including any incompatibilities)</b>	Store locked up. Store in tightly closed container. Store away from incompatible materials (see Section 10 of the MSDS).
<b>8. Exposure controls/personal protection</b>	
<b>A. Exposure limit values, biological limit values, etc</b>	No exposure limits noted for ingredient(s).
<b>Biological limit values</b>	No biological exposure limits noted for the ingredient(s).
<b>B. Appropriate engineering controls</b>	<p>Good general ventilation (typically 10 air changes per hour) 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.</p> <p>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. Provide eyewash station and safety shower.</p>
<b>C. Personal protective equipment</b>	
<ul style="list-style-type: none"> <li>• <b>Respiratory protection</b></li> </ul>	No personal respiratory protective equipment normally required. In case of insufficient ventilation, wear suitable respiratory equipment.
<ul style="list-style-type: none"> <li>• <b>Eye protection</b></li> </ul>	Wear safety glasses with side shields (or goggles).
<ul style="list-style-type: none"> <li>• <b>Hand protection</b></li> </ul>	Wear appropriate chemical resistant gloves. Wear gloves to prevent metal cuts and skin abrasions during handling.
<ul style="list-style-type: none"> <li>• <b>Body protection</b></li> </ul>	Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

**Hygiene measures**

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. 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.

**9. Physical and chemical properties****A. Appearance**

Physical state	Solid.
Form	Solid.
Color	Grey metallic.

**B. Odor** None.

**C. Odor threshold** Not applicable.

**D. pH** Not applicable.

**E. Melting point/freezing point**

**Melting point** 4434.8 °F (2446 °C) estimated

**Freezing point** Not applicable.

**F. Boiling point, initial boiling point, and boiling range** Not applicable.

**G. Flash point** Not applicable.

**H. Evaporation rate** Not applicable.

**I. Flammability (solid, gas)** None known.

**J. Upper/lower limit on flammability or explosive limits**

**Flammability limit - lower (%)** Not applicable.

**Flammability limit - upper (%)** Not applicable.

**Explosive limit - lower (%)** Not applicable.

**Explosive limit - lower (%) temperature** Not applicable.

**Explosive limit - upper (%)** Not applicable.

**Explosive limit - upper (%) temperature** Not applicable.

**K. Vapor pressure** Not applicable.

**L. Solubility**

**Solubility (water)** Insoluble.

**M. Vapor density** Not applicable.

**N. Specific gravity** Not applicable.

**O. n-octanol/water partition coefficient** Not applicable.

**P. Auto-ignition temperature** Not applicable.

**Q. Decomposition temperature** Not applicable.

**R. Viscosity** Not applicable.

**S. Molecular weight** Not available.

**Other data**

**Density** 22.42 g/cm<sup>3</sup> estimated

**Explosive properties** Not explosive.

**Oxidizing properties** Not oxidizing.

**10. Stability and reactivity**

**Reactivity** The product is stable and non-reactive under normal conditions of use, storage and transport.

**A. Stability and hazardous reaction potential**

**Stability** Material is stable under normal conditions.

<b>Hazardous reaction potential</b>	No dangerous reaction known under conditions of normal use.
<b>B. Conditions to avoid (e.g. static discharge, shock or vibration, etc)</b>	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Contact with incompatible materials.
<b>C. Incompatible materials</b>	Strong oxidizing agents.
<b>D. Hazardous decomposition products</b>	No hazardous decomposition products are known.

## 11. Toxicological information

### A. Information on likely routes of exposure

- **Respiratory organs** May cause irritation to the respiratory system.
- **Skin** Causes skin irritation.
- **Eyes** Not relevant, due to the form of the product. Causes serious eye irritation.
- **Mouth** Expected to be a low ingestion hazard.

### B. Information on health hazards

- **Acute toxicity (list all possible routes of exposure)** Due to lack of data the classification is not possible.
- **Corrosivity or irritation to the skin** Causes skin irritation. Not relevant, due to the form of the product.
- **Serious eye damage/eye irritation** Causes serious eye irritation. Not likely, due to the form of the product.
- **Respiratory sensitization** Not a respiratory sensitizer.
- **Skin sensitization** This product is not expected to cause skin sensitization.
- **Carcinogenic properties /Carcinogenicity** Suspected of causing cancer.
- **Mutagenic properties /Mutagenicity** Not classified.
- **Reproductive toxicity** This product is not expected to cause reproductive or developmental effects.
- **Specific target organ toxicity - single exposure** May cause respiratory irritation.
- **Specific target organ toxicity - repeated exposure** Not classified.
- **Aspiration hazard** Not an aspiration hazard.

## 12. Ecological information

### A. Ecotoxicity

#### **Hazardous to the aquatic environment, acute hazard**

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

### B. Persistence/degradability

No data is available on the degradability of any ingredients in the mixture.

### C. Bioaccumulative potential

No data available.

### D. Mobility in soil

The product is immiscible with water and will spread on the water surface.

### E. Other adverse effects

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

### A. Method of disposal

Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container (in accordance with related regulations).

### B. Disposal considerations (including disposal of contaminated containers or packaging)

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.

**Waste code**

The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

**14. Transport information****IATA**

- A. UN number** Not applicable.  
**B. UN proper shipping name** Not applicable.  
**C. Transport hazard class(es)**  
    **Class** Not applicable.  
    **Subsidiary risk** -  
**D. Packing group** Not applicable.  
**E. Environmental hazards** No.  
**F. Special precautions for user** Not applicable.

**IMDG**

- A. UN number** Not applicable.  
**B. UN proper shipping name** Not applicable.  
**C. Transport hazard class(es)**  
    **Class** Not applicable.  
    **Subsidiary risk** -  
**D. Packing group** Not applicable.  
**E. Environmental hazards**  
    **Marine pollutant** No.  
**EmS** Not applicable.  
**F. Special precautions for user** Not applicable.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not applicable.

**15. Regulatory information****A. Restrictions under the Industrial Safety and Health Law****Harmful Substances Prohibited from Manufacturing**

Not regulated.

**Harmful Substances Requiring Permission for Manufacture or Use**

Not regulated.

**Controlled Hazardous Substances**

Not regulated.

**Harmful Substances Requiring Special Medical Examination**

Not regulated.

**Workplace Environmental Monitoring Harmful Materials**

Not regulated.

**Occupational Exposure Limit**

Not regulated.

**B. Restrictions under the Chemicals Control Law (Previously Toxic Chemicals Control Law)****Accidental Release Prevention Substances**

Not regulated.

**Act on the Registration and Evaluation of Chemicals****Banned Toxic Chemicals**

Not regulated.

**Designated Existing Chemicals Subject to Registration (PEC) (MoE No. 2015-92)**

Not listed.

**Restricted Chemical Substances**

Not regulated.

**Toxic Chemicals**

Not regulated.

### C. Restrictions under the Dangerous Substance Safety Management Act

### D. Restrictions under the Wastes Control Act

#### Halogenated Materials in Waste Organic Solvents

Not regulated.

#### Hazardous Substances

Not regulated.

### E. Restrictions under other foreign or domestic laws

#### Clean Air Conservation Act

##### Air Pollutants

Not regulated.

**Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides (Rules on PIC, MoE No. 2014-252, Dec. 31, 2014; Standards for Pesticides, RDA No. 2014-26), as amended**

Not listed.

##### Specific Air Pollutants

Not regulated.

### Further information

This material safety data sheet was prepared in accordance with Article 41 of the Industrial Safety and Health Law.

### Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Korea	Existing Chemicals List (ECL)	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

### Bibliography

ACGIH  
EPA: AQUIRE database  
NLM: Hazardous Substances Data Base  
US. IARC Monographs on Occupational Exposures to Chemical Agents  
Korea. Accidental Release Prevention Substances (Presidential Decree of Toxic Chemical Control Law, Executive Order No. 19203)  
Korea. Dangerous Substances Threshold Quantity (Presidential Decree of Dangerous Substances Safety Management Act No. 18406, Schedule 1)  
Korea. Harmful Substances Prohibited from Manufacturing (Presidential Decree on the Industrial Safety and Health Act (No. 13053), Article 29)  
Korea. Harmful Substances Requiring Permission for Manufacture or Use (Presidential Decree on the Industrial Safety and Health Act (No. 13053), Article 30)  
Korea. OELs. Regulation for Permitted Concentration of Hazardous Substances (Ministry of Labor (MOL) Public Notice No. 1986-45, as amended)  
Korea. Prohibited Chemical Substances (TCCL Article 11)  
Korea. Regulated volatile organic compounds (VOCs) (MOE Notice No. 2001-36, March 8, 2001, as amended)  
Korea. Restricted Chemical Substances (TCCL Article 11)  
Korea. Toxic Chemical Control Law (TCCL), Existing Chemicals Inventory (KECI)  
Korea. Toxic Chemical Control Law (TCCL), pre-1997 List  
Korea. Toxic Chemicals (TCCL Article 10)  
Korea. Toxic Release Inventory (TRI) Chemicals (TCCL Article 14)  
Korea. Accidental Release Prevention Substances (Pres. Decree of Toxic Chemical Control Law, Ex. Order No. 19203, Tables 2 & 3, Dec 28, 2005)  
Korea. OELs (ISHL Article 42; MOL Public Notice No. 1986-45, as amended through MOEL Notice 2013-38, August 14, 2013)  
Korea. Prohibited Chemical Substances (AREC "K-REACH" Article 27; Designation of Toxic, Restricted or Banned Chemicals Appendices 4 and 5)  
Korea. Restricted Chemical Substances (AREC "K-REACH" Article 27; Designation of Toxic, Restricted or Banned Chemicals Appendices 2 and 3)  
KECI, January 27, 2015, amended through MoE 2016-138, July 13, 2016  
Korea. Toxic Chemicals (AREC "K-REACH" Article 20; Designation of Toxic, Restricted or Banned Chemicals Appendix 1)  
Korea. Toxic Release Inventory (TRI) Chemicals (MOE Public Notice No. 2002-166, Nov. 8, 2002)

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