



# MATERIAL SAFETY DATA SHEET

## MATERION

### 1. Chemical product and company identification

**A. Product name** Zirconium Dioxide Targets

**Other means of identification**

SDS number G64  
CAS number 1314-23-4

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

**Recommended use** Manufacture of computer, electronic and optical products, electrical equipment  
Scientific research and development  
Other: Manufacture of medical and defense equipment

**Limitations on use** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)  
Consumer uses: Private households (= general public = consumers)

**C. Supplier information**

**Company name** Materion Advanced Materials  
**Address** 6070 Parkland Boulevard  
Mayfield Heights OH 44124  
United States

**Telephone** EH&S 1.216.383.4019

**Email** ehs@materion.com

**Contact person** Theodore Knudson

**Emergency telephone number** See Section 16.

**Importer**

**Company name** See above.

**MSDS number** G64

### 2. Hazards identification

**A. Hazard category/Classification**

**Physical hazards** Not classified.

**Health hazards** Not classified.

**Environmental hazards** Not classified.

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

• **Pictogram** None.

• **Signal word** None.

• **Hazard statement** The substance does not meet the criteria for classification.

• **Precautionary statement**

**Prevention** Observe good industrial hygiene practices.

**Response** Wash hands after handling.

**Storage** Store away from incompatible materials.

**Disposal** Dispose of waste and residues in accordance with local authority requirements.

**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 (%)
Zirconium Dioxide Targets		1314-23-4	KE-35630	100

#### 4. First aid measures

A. In case of eye contact	Rinse with water. Get medical attention if irritation develops and persists.
B. In case of skin contact	Wash off with soap and water. Get medical attention if irritation develops and persists.
C. In case of inhalation	Move to fresh air. Call a physician if symptoms develop or persist.
D. In case of swallowing	Rinse mouth. Get medical attention if symptoms occur.
E. Note to physician	Treat symptomatically.
Most important symptoms/effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
General advice	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

#### 5. Fire-fighting measures

A. Suitable (and unsuitable) extinguishing media	
Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	None known.
B. Specific hazards arising from the chemical (example: hazardous combustion products)	This product is not flammable.
C. Specific methods of fire-fighting	
Special protective equipment for firefighters	Use protective equipment appropriate for surrounding materials.
Special fire fighting procedures	Use water spray to cool unopened containers.
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

A. Personal precautions, protective equipment and emergency measures	Keep unnecessary personnel away. For personal protection, see section 8 of the MSDS.
B. Environmental precautions	Avoid discharge into drains, water courses or onto the ground.
C. Methods and materials for containment and cleaning up	Stop the flow of material, if this is without risk. Following product recovery, flush area with water. For waste disposal, see section 13 of the MSDS.

#### 7. Handling and storage

A. Precautions for safe handling	Observe good industrial hygiene practices.
B. Conditions for safe storage (including any incompatibilities)	Store away from incompatible materials (see Section 10 of the MSDS).

#### 8. Exposure controls/personal protection

##### A. Exposure limit values, biological limit values, etc

###### Korea. OELs. Standards for Exposure to Chemical Substances and Physically Hazardous Factors

Material	Type	Value
Zirconium Dioxide Targets (CAS 1314-23-4)	STEL	10 mg/m3
	TWA	5 mg/m3

###### US. ACGIH Threshold Limit Values

Material	Type	Value
Zirconium Dioxide Targets (CAS 1314-23-4)	STEL	10 mg/m3
	TWA	5 mg/m3

<b>Biological limit values</b>	No biological exposure limits noted for the ingredient(s).
<b>B. Appropriate engineering controls</b>	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.
<b>C. Personal protective equipment</b>	
• Respiratory protection	Not available.
• Eye protection	Wear approved safety glasses, goggles, face shield and/or welder's helmet when risk of eye injury is present, particularly during operations that generate dust, mist or fume.
• Hand protection	Wear gloves to prevent metal cuts and skin abrasions during handling.
• Body protection	Wear suitable protective clothing.
<b>Hygiene measures</b>	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

<b>A. Appearance</b>	
Physical state	Solid.
Form	Solid.
Color	Grey.
<b>B. Odor</b>	None.
<b>C. Odor threshold</b>	Not applicable.
<b>D. pH</b>	Not applicable.
<b>E. Melting point/freezing point</b>	
Melting point	4892 °F (2700 °C)
Freezing point	Not applicable.
<b>F. Boiling point, initial boiling point, and boiling range</b>	Not applicable.
<b>G. Flash point</b>	Not applicable.
<b>H. Evaporation rate</b>	Not applicable.
<b>I. Flammability (solid, gas)</b>	Not applicable.
<b>J. Upper/lower limit on flammability or explosive limits</b>	
Flammability limit - lower (%)	Not applicable.
Flammability limit - upper (%)	Not applicable.
Explosive limit - lower (%)	Not applicable.
Explosive limit - upper (%)	Not applicable.
<b>K. Vapor pressure</b>	Not applicable.
<b>L. Solubility</b>	
Solubility (water)	Insoluble.
<b>M. Vapor density</b>	Not applicable.
<b>N. Specific gravity</b>	Not applicable.
<b>O. n-octanol/water partition coefficient</b>	Not applicable.
<b>P. Auto-ignition temperature</b>	Not applicable.
<b>Q. Decomposition temperature</b>	Not applicable.
<b>R. Viscosity</b>	Not applicable.
<b>S. Molecular weight</b>	123.22 g/mol
<b>Other data</b>	
Explosive properties	Not explosive.
Flammability	Not applicable.

Molecular formula	O2Zr
Oxidizing properties	Not oxidizing.
Partition coefficient (oil/water)	Not applicable.
Relative density	5.89 g/ml at 25 °C

## 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

<b>Stability</b>	Material is stable under normal conditions.
<b>Hazardous reaction potential</b>	No dangerous reaction known under conditions of normal use.

**B. Conditions to avoid (e.g. static discharge, shock or vibration, etc)** Contact with incompatible materials.

**C. Incompatible materials** Strong oxidizing agents.

**D. Hazardous decomposition products** No hazardous decomposition products are known.

## 11. Toxicological information

### A. Information on likely routes of exposure

- **Respiratory organs** Not likely, due to the form of the product.
- **Skin** No adverse effects due to skin contact are expected.
- **Eyes** Not relevant, due to the form of the product.
- **Mouth** Expected to be a low ingestion hazard.

### B. Information on health hazards

- **Acute toxicity (list all possible routes of exposure)** None known.
- **Corrosivity or irritation to the skin** Not likely, due to the form of the product.
- **Serious eye damage/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** Not classifiable as to carcinogenicity to humans.
- **Mutagenic properties /Mutagenicity** Not classified.
- **Reproductive toxicity** Not classified.
- **Specific target organ toxicity - single exposure** Not classified.
- **Specific target organ toxicity - repeated exposure** May cause damage to organs through prolonged or repeated exposure.
- **Aspiration hazard** Not an aspiration hazard.

## 12. Ecological information

**A. Ecotoxicity** 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.

**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.

**B. Persistence/degradability** No data is available on the degradability of this substance.

**C. Bioaccumulative potential** No data available.

**D. Mobility in soil** The product is immiscible with water and will sediment in water systems.

**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.

**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

Zirconium Dioxide Targets (CAS 1314-23-4)

##### Harmful Substances Requiring Special Medical Examination

Zirconium Dioxide Targets (CAS 1314-23-4)

##### Workplace Environmental Monitoring Harmful Materials

Zirconium Dioxide Targets (CAS 1314-23-4)

##### Occupational Exposure Limit

Zirconium Dioxide Targets (CAS 1314-23-4)

#### 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**

<b>Country(s) or region</b>	<b>Inventory name</b>	<b>On inventory (yes/no)*</b>
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

### A. Source of information

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)

### B. Issue date

02-26-2020

### C. Number of revisions and date of most recent revision

09-23-2021 (02 revision)

### Further information

Transportation Emergency  
Call Chemtrec at:  
International: 703.741.5970  
Spain: 900.868.538  
Switzerland: 0800.564.402  
Chemtrec's toll free, mobile-enabled number in Germany – 0800 1817059

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### Other information

Revised information in Section 16.