

**MATERION****1. Chemical and company identification**

**Name of chemical (Product name)** Silicon Aluminum Zirconium Oxide Targets

**Supplier's company name, address and phone number**

**Company name** Materion Advanced Materials

**Address** 6070 Parkland Boulevard  
Mayfield Heights, OH 44124 United States

**Contact person** Theodore Knudson

**Telephone** EH&S 1.216.383.4019

**e-mail address** ehs@materion.com

**Emergency telephone number** See Section 16.

**Reference number** G46

**2. Hazards identification****GHS classification**

**Physical hazards** The product is not classified according to GHS.

**Health hazards** Sensitization, skin Category 1

**Environmental hazards** The product is not classified according to GHS.

**GHS label elements**

**Pictograms** None.

**Signal words** None.

**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.

**Precautionary statement**

**Prevention** Observe good industrial hygiene practices.

**Response** None.

**Storage** Store locked up.

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

**Other hazards which do not result in classification** None known.

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

**Main symptoms and emergency overview**

**Main symptoms** None known.

**Emergency overview** 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.

**3. Composition/information on ingredients**

**Substance or mixture** Mixture

Chemical name or generic name	CAS Number	Gazette notification		Concentration (%)
		ENCS no.	ISHL no.	
Silicon	7440-21-3			63
Zirconium oxide	1314-23-4	(1)-563	(1)-563	32
Aluminum	7429-90-5			5

**Chemical formula** Si (7440-21-3), O<sub>2</sub>Zr (1314-23-4), Al (7429-90-5)

## 4. First aid measures

If inhaled	Move to fresh air. Call a physician if symptoms develop or persist.
If on skin	Wash off with soap and water. Get medical attention if irritation develops and persists.
If in eyes	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
If swallowed	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Under normal conditions of intended use, this material does not pose a risk to health.
Protection of first-aid responders	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

Extinguishing media	Powder. Dry sand.
Extinguishing media to avoid	Carbon dioxide (CO <sub>2</sub> ).
Specific hazards	Non-combustible, substance itself does not burn.
Special fire fighting procedures	Move containers from fire area if you can do so without risk.
Protection of fire-fighters	Wear suitable protective equipment.
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, protective equipment and emergency procedures	Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.
Environmental precautions	No special environmental precautions required.
Methods and materials for containment and cleaning up	Stop the flow of material, if this is without risk. For waste disposal, see section 13 of the SDS.

## 7. Handling and storage

### Handling

Technical measures (e.g. Local and general ventilation)	Provide adequate ventilation.
Safe handling advice	Use personal protection recommended in Section 8 of the SDS.
Contact avoidance measures	Chlorine. Fluorine. For further information, please refer to section 10 of the SDS.
Hygiene measures	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.

### Storage

Safe storage conditions	Store locked up. Store away from incompatible materials (see Section 10 of the SDS).
Safe packaging materials	Keep locked up.

## 8. Exposure controls/personal protection

Control parameters	Follow standard monitoring procedures.
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### Occupational exposure limits

#### Japan. OELs - ISHL. (Workplace Environment Assessment Standards)

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TLV	0.025 mg/m <sup>3</sup>	Dust.

#### Japan. OELs - JSOH (Japan Society of Occupational Health: Recommendation of Occupational Exposure Limits)

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TWA	2 mg/m <sup>3</sup>	Total dust.
		0.5 mg/m <sup>3</sup>	Respirable dust.

## US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TWA	1 mg/m3	Respirable fraction.
Zirconium oxide (CAS 1314-23-4)	STEL	10 mg/m3	
	TWA	5 mg/m3	

**Engineering measures** 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.

### Personal protective equipment

<b>Respiratory protection</b>	Not available.
<b>Hand protection</b>	Wear gloves to prevent metal cuts and skin abrasions during handling.
<b>Eye protection</b>	Wear safety glasses with side shields (or goggles).
<b>Skin and body protection</b>	Wear suitable protective clothing.

## 9. Physical and chemical properties

<b>Physical state</b>	Solid.
<b>Form</b>	Solid.
<b>Color</b>	Grey.
<b>Odor</b>	None.
<b>Odor threshold</b>	Not applicable.
<b>Melting point/freezing point</b>	1220 °F (660 °C) estimated / Not applicable.
<b>Boiling point, initial boiling point, and boiling range</b>	Not applicable.
<b>Combustibility</b>	None known.
<b>Lower and upper explosion limit / flammability limit</b>	
<b>Flammability limit - lower (%)</b>	Not applicable.
<b>Flammability limit - lower (%) temperature</b>	Not applicable.
<b>Flammability limit - upper (%)</b>	Not applicable.
<b>Flammability limit - upper (%) temperature</b>	Not applicable.
<b>Explosive limit - lower (%)</b>	Not applicable.
<b>Explosive limit - lower (%) temperature</b>	Not applicable.
<b>Explosive limit - upper (%)</b>	Not applicable.
<b>Explosive limit - upper (%) temperature</b>	Not applicable.
<b>Flash point</b>	Not applicable.
<b>Auto-ignition temperature</b>	Not applicable.
<b>Decomposition temperature</b>	Not applicable.
<b>pH</b>	Not applicable.
<b>Kinematic viscosity</b>	Not available.
<b>Solubility(ies)</b>	
<b>Solubility (water)</b>	Insoluble.
<b>Partition coefficient (n-octanol/water) (log value)</b>	Not applicable.
<b>Vapor pressure</b>	Not applicable.

<b>Density and/or relative density</b>	
Density	2.36 g/cm <sup>3</sup> estimated
Relative density	Not applicable.
Vapor density	Not applicable.
Particle characteristics	Not available.
<b>Other information</b>	
Evaporation rate	Not applicable.
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Viscosity (Coefficient of 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>Chemical 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>	Acids. Alkalies.
<b>Hazardous decomposition products</b>	No hazardous decomposition products are known.

## 11. Toxicological information

<b>Acute toxicity</b>	None known.
<b>Skin corrosion/irritation</b>	Not likely, due to the form of the product.
<b>Serious eye damage/eye irritation</b>	None known.
<b>Respiratory or skin sensitization</b>	
Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	Not a skin sensitizer.
<b>Germ cell mutagenicity</b>	Not classified.
<b>Carcinogenicity</b>	Not classifiable as to carcinogenicity to humans.
<b>ACGIH Carcinogens</b>	
Aluminum (CAS 7429-90-5)	A4 Not classifiable as a human carcinogen.
Zirconium oxide (CAS 1314-23-4)	A4 Not classifiable as a human carcinogen.

<b>Reproductive toxicity</b>	Not classified.
<b>Specific target organ toxicity - single exposure</b>	Not classified.
<b>Specific target organ toxicity - repeated exposure</b>	Not classified.
<b>Aspiration hazard</b>	Not an aspiration hazard.

## 12. Ecological information

### Ecotoxicological data

Product	Species	Test Results
Silicon Aluminum Zirconium Oxide Targets		
<b>Aquatic</b>		
<i>Acute</i>		
Fish	LC50	Fish
		6.2 mg/l, 96 hours estimated
<b>Ecotoxicity</b>	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 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>	No data available for this product.
<b>Hazardous to the ozone layer</b>	No data available.
<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>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>	Contract with a disposal operator licensed by the Law on Disposal and Cleaning. Dispose of contents/container in accordance with local/regional/national/international regulations. When your own wastewater treatment plant is not available, collect entire waste and then charge to a licensed industrial waste management professional with manifests for industrial waste.

### 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.
<b>National regulations</b>	Follow regulation in section 15 for domestic transportation.

### 15. Regulatory information

#### Industrial Safety and Health Act

##### Notifiable substances

ALUMINUM	Table 9 Ordinance No. 37	5.0 %
ZIRCONIUM COMPOUNDS	Table 9 Ordinance No. 313	32 %

##### Labeling substances

ALUMINIUM AND ITS WATER-SOLUBLE SALTS		5.0 %
ZIRCONIUM COMPOUNDS		32 %

#### Poisonous and Deleterious Substances Control Act

##### Specified poisonous substances

Not regulated.

##### Poisonous substances

Not regulated.

##### Deleterious substances

Not regulated.

#### Act on the Regulation of Manufacture and Evaluation of Chemical Substances

##### Class I specified chemical substances

Not regulated.

##### Class II specified chemical substances

Not regulated.

##### Monitoring chemical substances

Not regulated.

##### Priority Assessment Chemical Substances (PACs)

Not regulated.

##### Reporting Exempted Substances

Not regulated.

#### Law concerning Pollutant Release and Transfer Register

##### Specified class 1 substances (substance name, ordinance number and content)

Not regulated.

##### Class 1 substances (substance name, ordinance number and content)

Not regulated.

## Class 2 substances (substance name, ordinance number and content)

Not regulated.

### Ship Safety Law, Dangerous Goods Marine Transport and Storage Rule

Not regulated.

### Air Law, Enforcement Rule

Not regulated.

### Explosives Control Act

Not regulated.

## 16. Other information

### Bibliography

ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices  
HSDB® - Hazardous Substances Data Bank  
IARC Monographs. Overall Evaluation of Carcinogenicity  
National Toxicology Program (NTP) Report on Carcinogens  
Japan Society for Occupational Health, Recommendation of Occupational Exposure Limits  
Japan Chemical Industry Association (JCIA) GHS Guideline, June 2012  
JIS Z 7252:2014 Classification of chemicals based on "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)"  
JIS Z 7253:2012 Hazard communication of chemicals based on GHS - Labelling and Safety Data Sheet (SDS)

### 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.