



MATERIAL SAFETY DATA SHEET

MATERION

1. Chemical product and company identification

A. Product name	Zinc Oxide/Magnesium Oxide Targets
Other means of identification	
SDS number	G20
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	Consumer uses: Private households (= general public = consumers)
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
Importer	
Company name	See above.
MSDS number	G20

2. Hazards identification

A. Hazard category/Classification	
Physical hazards	Not classified.
Health hazards	Specific target organ toxicity, single exposure Category 1 Specific target organ toxicity, repeated exposure Category 1
Environmental hazards	Hazardous to the aquatic environment, acute hazard Category 1 Hazardous to the aquatic environment, long-term hazard Category 1
B. Warning label items including precautionary statement	
• Pictogram	None.
• Signal word	None.
• Hazard statement	
H370	Causes damage to organs.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
• Precautionary statement	
Prevention	Observe good industrial hygiene practices.
Response	Wash hands after handling.
Storage	
P405	Store locked up.
Disposal	
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.

3. Composition/information on ingredients

Chemical identity	Common and alternative names	CAS number	ID number	Content in percent (%)
Zinc Oxide		1314-13-2	KE-35565	80 - 95
Other components below reportable levels				5 - 20

4. First aid measures

A. In case of eye contact	Do not rub eyes. 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	None known.
General advice	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

A. Suitable (and unsuitable) extinguishing media	
Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO ₂).
Unsuitable extinguishing media	None known.
B. Specific hazards arising from the chemical (example: hazardous combustion products)	No unusual fire or explosion hazards noted.
C. Specific methods of fire-fighting	
Special protective equipment for firefighters	Wear suitable protective equipment.
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. Wear appropriate protective equipment and clothing during clean-up.
B. Environmental precautions	Prevent further leakage or spillage if safe to do so.
C. Methods and materials for containment and cleaning up	Wear appropriate protective equipment and clothing during clean-up. Stop the flow of material, if this is without risk.

7. Handling and storage

A. Precautions for safe handling	Do not handle until all safety precautions have been read and understood. Observe good industrial hygiene practices.
B. Conditions for safe storage (including any incompatibilities)	Keep locked up.

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

Components	Type	Value	Form
Zinc Oxide (CAS 1314-13-2)	STEL	10 mg/m ³	
	TWA	5 mg/m ³ 2 mg/m ³	Respirable fraction.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Zinc Oxide (CAS 1314-13-2)	STEL	10 mg/m ³	Respirable fraction.
	TWA	2 mg/m ³	Respirable fraction.

Biological limit values

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

B. Appropriate engineering controls

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. If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits.

C. Personal protective equipment

- **Respiratory protection** If ventilation is insufficient, suitable respiratory protection must be provided.
- **Eye protection** Not available.
- **Hand protection** Wear gloves to prevent metal cuts and skin abrasions during handling.
- **Body protection** Use of an impervious apron is recommended.

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.

9. Physical and chemical properties

A. Appearance

Physical state	Solid.
Form	Solid.
Color	Dark green.

B. Odor None.

C. Odor threshold Not applicable.

D. pH Not applicable.

E. Melting point/freezing point

Melting point Not applicable.

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 - lower (%) temperature Not applicable.

Flammability limit - upper (%)	Not applicable.
Flammability limit - upper (%) temperature	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	5.25 g/cm ³ 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.
Hazardous reaction potential	No dangerous reaction known under conditions of normal use.
B. Conditions to avoid (e.g. static discharge, shock or vibration, etc)	No special precautions are necessary beyond normal good hygiene practices. See Section 8 of the MSDS for additional personal protection advice when handling this product.
C. Incompatible materials	None known.
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	Not likely, due to the form of the product.
• Eyes	Dust may irritate the eyes.
• Mouth	Expected to be a low ingestion hazard.
B. Information on health hazards	
• Acute toxicity (list all possible routes of exposure)	Not 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** Not a skin sensitizer.
- **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** Causes damage to organs.
- **Specific target organ toxicity - repeated exposure** Causes damage to organs through prolonged or repeated exposure.
- **Aspiration hazard** Not an aspiration hazard.

12. Ecological information

- A. Ecotoxicity** Not relevant, due to the form of the product.
- 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.
- Hazardous to the aquatic environment, long-term hazard** Not relevant, due to the form of the product.
- 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** No data available for this product.
- 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. 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 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

Zinc Oxide (CAS 1314-13-2)

Harmful Substances Requiring Special Medical Examination

MINERAL DUST (CAS 1314-13-2) Dust

Workplace Environmental Monitoring Harmful Materials

OTHER MINERAL DUST (CAS 1314-13-2) Dust

Occupational Exposure Limit

Zinc Oxide (CAS 1314-13-2)

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)

Zinc Oxide (CAS 1314-13-2)

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

Zinc Oxide (CAS 1314-13-2)

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: ACQUIRE 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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