



SAFETY DATA SHEET

MATERION

1. Product and company identification

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| Name of the chemical | Titanium Oxide Targets |
| Other means of identification | |
| SDS number | G43 |
| CAS number | 12137-20-1 |
| Recommended use of the chemical and restrictions on use | |
| Recommended use | Manufacture of computer, electronic and optical products, electrical equipment Scientific research and development Other: Manufacture of medical and defense equipment |
| Recommended restrictions | Professional uses: Public domain (administration, education, entertainment, services, craftsmen) Consumer uses: Private households (= general public = consumers) |
| Manufacturer/Importer/Supplier/ Distributor information | Materion Advanced Materials Germany GmbH |
| Address | Borsigstrasse 10 Alzenau 63755 Germany |
| Telephone | 49.60.23.91.82.0 |
| E-mail | Materion.Germany@materion.com |
| Contact person | Hermann Schmiing |
| Emergency telephone number | 49.60.23.91.82.0 |

2. Hazards identification

| | |
|--------------------------|---|
| Hazard classification | |
| Physical hazards | Not classified. |
| Health hazards | Not classified. |
| Environmental hazards | Not classified. |
| Label elements | |
| Symbols | None. |
| Signal word | 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 | Wash hands after handling. |
| Storage | Store away from incompatible materials. |
| Disposal | Dispose of waste and residues in accordance with local authority requirements. |
| Other hazards | None known. |
| Supplemental information | For further information, please contact the Product Stewardship Department at +1.216.383.4019. |

3. Composition/information on ingredients

| Substance | | |
|---------------------|------------|-------------------|
| Chemical properties | CAS Number | Concentration (%) |
| Titanium Oxide | 12137-20-1 | 100 |

4. First aid measures

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| First aid measures for different exposure routes | |
| Inhalation | Move to fresh air. Call a physician if symptoms develop or persist. |

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| Skin contact | Wash off with soap and water. Get medical attention if irritation develops and persists. |
| Eye contact | Rinse with water. Get medical attention if irritation develops and persists. |
| Ingestion | Rinse mouth. Get medical attention if symptoms occur. |
| Most important symptoms and effects | Direct contact with eyes may cause temporary irritation. |
| Personal protection for first-aid responders | Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. |
| Notes to physician | Treat symptomatically. |

5. Fire-fighting measures

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| Extinguishing media | Water fog. Foam. Dry chemical powder. Carbon dioxide (CO ₂). |
| Extinguishing media to avoid | None known. |
| Specific hazards during fire fighting | None known. |
| Special fire fighting procedures | Use water spray to cool unopened containers. |
| 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

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| Personal precautions | Keep unnecessary personnel away. For personal protection, see section 8 of the SDS. |
| Environmental precautions | Avoid discharge into drains, water courses or onto the ground. |
| Spill cleanup methods | Stop the flow of material, if this is without risk. For waste disposal, see section 13 of the SDS. |

7. Handling and storage

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| Handling | Avoid prolonged exposure. Observe good industrial hygiene practices. |
| Storage | Keep locked up. Store away from incompatible materials (see Section 10 of the SDS). |

8. Exposure controls/personal protection

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| Exposure limits | No exposure limits noted for ingredient(s). |
| Biological limit values | No biological exposure limits noted for the ingredient(s). |
| 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. |
| Individual protection measures, such as personal protective equipment | |
| Eye/face protection | Wear safety glasses with side shields (or goggles). |
| Skin protection | |
| Hand protection | Wear gloves to prevent metal cuts and skin abrasions during handling. |
| Other | Wear suitable protective clothing. |
| Respiratory protection | In case of insufficient ventilation, wear suitable respiratory equipment. |
| Thermal hazards | Wear appropriate thermal protective clothing, when necessary. |
| General hygiene considerations | 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

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|-------------------------------------|-------------------|
| Appearance | |
| Physical state | Solid. |
| Form | Solid. |
| Color | White. |
| Odor | None. |
| Odor threshold | Not applicable. |
| Melting point/freezing point | 3317 °F (1825 °C) |

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|---|------------------------|
| pH | Not applicable. |
| Boiling point, initial boiling point, and boiling range | Not applicable. |
| Flammability (solid, gas) | None known. |
| Flash point | Not applicable. |
| Decomposition temperature | Not applicable. |
| Auto-ignition temperature | Not applicable. |
| Upper/lower 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. |
| Vapor pressure | Not applicable. |
| Vapor pressure temp. | Not applicable. |
| Vapor density | Not applicable. |
| Density | 3.90 g/cm ³ |
| Solubility(ies) | |
| Solubility (water) | Insoluble. |
| Partition coefficient (n-octanol/water) | Not applicable. |
| Evaporation rate | Not applicable. |
| Other data | |
| Explosive properties | Not explosive. |
| Explosivity | Not applicable. |
| Molecular formula | TiO ₂ |
| Molecular weight | 63.87 g/mol |
| Oxidizing properties | Not oxidizing. |
| Relative density | Not applicable. |
| Viscosity | Not applicable. |

10. Stability and reactivity

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| Reactivity | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| Stability | Material is stable under normal conditions. |
| Possibility of hazardous reactions | No dangerous reaction known under conditions of normal use. |
| Conditions to avoid | Contact with incompatible materials. |
| Incompatible materials | Ammonia. Chlorine. |
| Hazardous decomposition products | No hazardous decomposition products are known. |

11. Toxicological information

Information on likely routes of exposure

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|---------------------|--|
| Inhalation | Not likely, due to the form of the product. |
| Skin contact | No adverse effects due to skin contact are expected. |
| Eye contact | Not relevant, due to the form of the product. |
| Ingestion | Expected to be a low ingestion hazard. |

| | |
|---|-------------------------------|
| Symptoms | None known. |
| Information on toxicological effects | |
| Acute toxicity | None known. |
| Skin corrosion/irritation | Not classified. |
| Serious eye damage/eye irritation | None known. |
| Respiratory or skin sensitization | |
| Respiratory sensitization | Not a respiratory sensitizer. |
| Skin sensitization | Not a skin sensitizer. |
| Germ cell mutagenicity | Not classified. |
| Carcinogenicity | Not classified. |
| Reproductive toxicity | Not classified. |
| Specific target organ toxicity - single exposure | Not classified. |
| Specific target organ toxicity - repeated exposure | Not classified. |
| Aspiration hazard | Not an aspiration hazard. |
| Chronic effects | None known. |

12. Ecological information

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|--------------------------------------|--|
| 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. |
| Persistence and degradability | No data is available on the degradability of any ingredients in the mixture. |
| Bioaccumulation | No data available. |
| Mobility in soil | No data available for this product. |
| Other hazardous 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

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| Disposal instructions | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. |
| Residual waste | 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). |
| Contaminated 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. |
| Local disposal regulations | Dispose in accordance with all applicable regulations. |

14. Transport information

| | |
|---|-----------------------------------|
| IATA | Not regulated as dangerous goods. |
| IMDG | Not regulated as dangerous goods. |
| Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code | Not applicable. |

15. Regulatory information

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|---|-------------|
| Applicable regulations | |
| Methods and Facilities Standards for the Storage, Clearance and Disposal of Industrial Waste | Not listed. |
| Priority Management Chemical List (Regulations on Handling Priority Managed Chemicals), as amended | Not listed. |

Toxic Chemical Substances (TCS) List (EPA Toxic Substances Notice No. 0960095331E, Tables 1-3, Dec. 17, 2007, as amended)

Not listed.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Montreal Protocol

Not applicable.

Kyoto protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|-----------------------------|--|-------------------------------|
| Australia | Australian Inventory of Chemical Substances (AICS) | Yes |
| Canada | Domestic Substances List (DSL) | Yes |
| Canada | Non-Domestic Substances List (NDSL) | No |
| China | Inventory of Existing Chemical Substances in China (IECSC) | Yes |
| Europe | European Inventory of Existing Commercial Chemical Substances (EINECS) | Yes |
| Europe | European List of Notified Chemical Substances (ELINCS) | No |
| Japan | Inventory of Existing and New Chemical Substances (ENCS) | Yes |
| Korea | Existing Chemicals List (ECL) | Yes |
| New Zealand | New Zealand Inventory | Yes |
| Philippines | Philippine Inventory of Chemicals and Chemical Substances (PICCS) | Yes |
| Taiwan | Taiwan Chemical Substance Inventory (TCSI) | Yes |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | 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

References

ACGIH
EPA: AQUIRE database
NLM: Hazardous Substances Data Base
US. IARC Monographs on Occupational Exposures to Chemical Agents
Taiwan. Dangerous Materials (Rules on Hazard Communication of Dangerous Materials and Toxic Materials)
Taiwan. Industrial Precursor Chemicals (Categories and Regulations Governing Inspection and Declaration of Industrial Precursor Chemicals, MOEA Decree No. 87, as amended)
Taiwan. OELs. (Standards on Workplace Atmosphere of Dangerous and Hazardous Materials)
Taiwan. Toxic Chemical Substances (TCS) (List of Toxic Chemical Substances announced by the Environmental Protection Administration)
Taiwan. Toxic Materials (Rules on Hazard Communication of Dangerous Materials and Toxic Materials)

Issued by

Not available.

Prepared by

Not available.

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