



PRODUCT INFORMATION SHEET

MATERION

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

| | |
|---|---------------------------------------|
| Trade name or designation of the mixture | Niobium Oxide/Zirconium Oxide Targets |
| Registration number | - |
| Document number | G45 |
| Synonyms | None. |
| Issue date | 18-February-2019 |
| Version number | 03 |
| Revision date | 17-September-2021 |
| Supersedes date | 16-February-2021 |

1.2. Relevant identified uses of the substance or mixture and uses advised against

| | |
|-----------------------------|--|
| Identified uses | Manufacture of computer, electronic and optical products, electrical equipment Scientific research and development Other: Manufacture of medical and defense equipment |
| Uses advised against | Professional uses: Public domain (administration, education, entertainment, services, craftsmen) Consumer uses: Private households (= general public = consumers) |

1.3. Details of the supplier of the product information sheet

Supplier

| | |
|-----------------------|--|
| Company name | Materion Advanced Materials |
| Address | 6070 Parkland Boulevard Mayfield Heights, OH 44124 United States |
| Division | |
| Telephone | 1.216.383.4019 |
| e-mail | ehs@materion.com |
| Contact person | Theodore Knudson |

1.4. Emergency telephone number

See Section 16.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 as amended

| | |
|-----------------------|--|
| Hazard summary | The products are classified as articles and, as such, do not present a physical or health hazard in the present form. If the products are processed or handled in ways that generate particles (dust, fume, particles or powder) and/or chemical compounds, a potential health hazard could exist and risk management measures must be taken to minimize risk. |
|-----------------------|--|

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

| | |
|--------------------------|---|
| Contains: | Niobium Oxide, Zirconium oxide |
| Hazard pictograms | None. |
| Signal word | None. |
| Hazard statements | 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 statements

| | |
|-------------------|---|
| Prevention | Observe good industrial hygiene practices. |
| Response | Wash hands after handling. |
| Storage | Store away from incompatible materials. |
| Disposal | |
| P501 | Dispose of contents/container in accordance with local/regional/national/international regulations. |

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

2.3. Other hazards None known.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

General information

| Chemical name | % | CAS-No. / EC No. | REACH Registration No. | Index No. | Notes |
|--------------------------|----|-------------------------|------------------------|-----------|-------|
| Niobium Oxide | 50 | 12034-57-0 234-808-1 | - | - | |
| Classification: - | | | | | |
| Zirconium oxide | 50 | 1314-23-4 215-227-2 | - | - | |
| Classification: - | | | | | |

SECTION 4: First aid measures

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

4.1. Description of first aid measures

Inhalation Call a physician if symptoms develop or persist.
Skin contact Get medical attention if irritation develops and persists.
Eye contact Get medical attention if irritation develops and persists.
Ingestion Get medical advice/attention if you feel unwell.

4.2. Most important symptoms and effects, both acute and delayed None known.

4.3. Indication of any immediate medical attention and special treatment needed Treat symptomatically.

SECTION 5: Firefighting measures

General fire hazards No unusual fire or explosion hazards noted.

5.1. Extinguishing media

Suitable extinguishing media Powder. Dry sand. Use methods for the surrounding fire.
Unsuitable extinguishing media None known.

5.2. Special hazards arising from the substance or mixture This product is not flammable.

5.3. Advice for firefighters

Special protective equipment for firefighters Wear suitable protective equipment.
Special firefighting procedures Use water spray to cool unopened containers.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel Keep unnecessary personnel away. For personal protection, see section 8 of the PIS.
For emergency responders Use personal protection recommended in Section 8 of the PIS.

6.2. Environmental precautions Collect spillage.

6.3. Methods and material for containment and cleaning up Collect spillage. For waste disposal, see section 13 of the PIS.

6.4. Reference to other sections Not available.

SECTION 7: Handling and storage

7.1. Precautions for safe handling Wash thoroughly after handling. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities Store away from incompatible materials (see Section 10 of the PIS).

7.3. Specific end use(s) Not available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

Austria. MAK List, OEL Ordinance (GwV), BGBl. II, no. 184/2001

| Components | Type | Value | Form |
|---------------------------------|------|----------------------|---------------------|
| Niobium Oxide (CAS 12034-57-0) | MAK | 5 mg/m ³ | Inhalable fraction. |
| | STEL | 10 mg/m ³ | Inhalable fraction. |
| Zirconium oxide (CAS 1314-23-4) | MAK | 5 mg/m ³ | Inhalable fraction. |

Belgium. Exposure Limit Values

| Components | Type | Value |
|---------------------------------|------|----------------------|
| Zirconium oxide (CAS 1314-23-4) | STEL | 10 mg/m ³ |
| | TWA | 5 mg/m ³ |

Croatia. Dangerous Substance Exposure Limit Values in the Workplace (ELVs), Annexes 1 and 2, Narodne Novine, 13/09

| Components | Type | Value |
|---------------------------------|------|----------------------|
| Zirconium oxide (CAS 1314-23-4) | MAC | 5 mg/m ³ |
| | STEL | 10 mg/m ³ |

Cyprus. OELs. Control of factory atmosphere and dangerous substances in factories regulation, PI 311/73, as amended.

| Components | Type | Value |
|---------------------------------|------|---------------------|
| Zirconium oxide (CAS 1314-23-4) | TWA | 5 mg/m ³ |

Denmark. Exposure Limit Values

| Components | Type | Value |
|---------------------------------|------|---------------------|
| Niobium Oxide (CAS 12034-57-0) | TLV | 5 mg/m ³ |
| Zirconium oxide (CAS 1314-23-4) | TLV | 5 mg/m ³ |

Finland. Workplace Exposure Limits

| Components | Type | Value |
|---------------------------------|------|---------------------|
| Zirconium oxide (CAS 1314-23-4) | TWA | 1 mg/m ³ |

Germany. TRGS 900, Limit Values in the Ambient Air at the Workplace

| Components | Type | Value | Form |
|---------------------------------|------|---------------------|---------------------|
| Zirconium oxide (CAS 1314-23-4) | AGW | 1 mg/m ³ | Inhalable fraction. |

Greece. OELs (Decree No. 90/1999, as amended)

| Components | Type | Value |
|---------------------------------|------|----------------------|
| Zirconium oxide (CAS 1314-23-4) | STEL | 10 mg/m ³ |
| | TWA | 5 mg/m ³ |

Hungary. OELs. Joint Decree on Chemical Safety of Workplaces

| Components | Type | Value |
|---------------------------------|------|----------------------|
| Zirconium oxide (CAS 1314-23-4) | STEL | 20 mg/m ³ |
| | TWA | 5 mg/m ³ |

Iceland. OELs. Regulation 154/1999 on occupational exposure limits

| Components | Type | Value |
|---------------------------------|------|---------------------|
| Zirconium oxide (CAS 1314-23-4) | TWA | 5 mg/m ³ |

Ireland. Occupational Exposure Limits

| Components | Type | Value |
|---------------------------------|------|----------------------|
| Zirconium oxide (CAS 1314-23-4) | STEL | 10 mg/m ³ |
| | TWA | 5 mg/m ³ |

Italy. Occupational Exposure Limits

| Components | Type | Value |
|---------------------------------|------|----------------------|
| Zirconium oxide (CAS 1314-23-4) | STEL | 10 mg/m ³ |
| | TWA | 5 mg/m ³ |

Lithuania. OELs. Limit Values for Chemical Substances, General Requirements

| Components | Type | Value |
|---------------------------------|------|---------------------|
| Zirconium oxide (CAS 1314-23-4) | TWA | 6 mg/m ³ |

Norway. Administrative Norms for Contaminants in the Workplace

| Components | Type | Value |
|---------------------------------|------|---------------------|
| Zirconium oxide (CAS 1314-23-4) | TLV | 5 mg/m ³ |

Poland. Ordinance of the Minister of Labour and Social Policy on 6 June 2014 on the maximum permissible concentrations and intensities of harmful health factors in the work environment, Journal of Laws 2014, item 817

| Components | Type | Value |
|---------------------------------|------|----------------------|
| Zirconium oxide (CAS 1314-23-4) | STEL | 10 mg/m ³ |
| | TWA | 5 mg/m ³ |

Portugal. VLEs. Norm on occupational exposure to chemical agents (NP 1796)

| Components | Type | Value |
|---------------------------------|------|----------------------|
| Zirconium oxide (CAS 1314-23-4) | STEL | 10 mg/m ³ |
| | TWA | 5 mg/m ³ |

Romania. OELs. Protection of workers from exposure to chemical agents at the workplace

| Components | Type | Value |
|---------------------------------|------|----------------------|
| Zirconium oxide (CAS 1314-23-4) | STEL | 10 mg/m ³ |
| | TWA | 5 mg/m ³ |

Slovakia. OELs. Regulation No. 300/2007 concerning protection of health in work with chemical agents

| Components | Type | Value |
|---------------------------------|------|---------------------|
| Zirconium oxide (CAS 1314-23-4) | TWA | 1 mg/m ³ |

Slovenia. OELs. Regulations concerning protection of workers against risks due to exposure to chemicals while working (Official Gazette of the Republic of Slovenia)

| Components | Type | Value | Form |
|---------------------------------|------|---------------------|---------------------|
| Niobium Oxide (CAS 12034-57-0) | TWA | 5 mg/m ³ | Inhalable fraction. |
| Zirconium oxide (CAS 1314-23-4) | TWA | 1 mg/m ³ | Inhalable dust. |

Spain. Occupational Exposure Limits Components

| | Type | Value |
|---------------------------------|------|----------------------|
| Zirconium oxide (CAS 1314-23-4) | STEL | 10 mg/m ³ |
| | TWA | 5 mg/m ³ |

Switzerland. SUVA Grenzwerte am Arbeitsplatz Components

| | Type | Value | Form |
|---------------------------------|------|---------------------|---------------------|
| Zirconium oxide (CAS 1314-23-4) | TWA | 5 mg/m ³ | Inhalable fraction. |

UK. EH40 Workplace Exposure Limits (WELs) Components

| | Type | Value |
|---------------------------------|------|----------------------|
| Zirconium oxide (CAS 1314-23-4) | STEL | 10 mg/m ³ |
| | TWA | 5 mg/m ³ |

| | |
|--|---|
| Biological limit values | No biological exposure limits noted for the ingredient(s). |
| Recommended monitoring procedures | Follow standard monitoring procedures. |
| Derived no effect levels (DNELs) | Not available. |
| Predicted no effect concentrations (PNECs) | Not available. |
| Exposure guidelines | This material does not have established exposure limits. |
| 8.2. Exposure controls | |
| Appropriate engineering controls | 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. |
| Individual protection measures, such as personal protective equipment | |
| General information | As a standard hygiene practice, wash hands before eating or smoking. |
| 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 | Use personal protective equipment as required. |
| Respiratory protection | In case of insufficient ventilation, wear suitable respiratory equipment. |
| Thermal hazards | Wear appropriate thermal protective clothing, when necessary. |
| 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. |
| Environmental exposure controls | Environmental manager must be informed of all major releases. |

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties****Appearance**

| | |
|-----------------------|---------|
| Physical state | Solid. |
| Form | Solid. |
| Colour | Silver. |

Odour None.

Odour threshold Not applicable.

pH Not applicable.

Melting point/freezing point 2200 - 2400 °C (3992 - 4352 °F) estimated / Not applicable.

Initial boiling point and boiling range Not applicable.

Flash point Not applicable.

Evaporation rate Not applicable.

Flammability (solid, gas) None known.

| | |
|--|------------------------------------|
| Vapour pressure | Not applicable. |
| Vapour density | Not applicable. |
| Relative density | Not applicable. |
| Solubility(ies) | |
| Solubility (water) | Insoluble. |
| Partition coefficient (n-octanol/water) | Not applicable. Not applicable. |
| Auto-ignition temperature | Not applicable. |
| Decomposition temperature | Not applicable. |
| Viscosity | Not applicable. |
| Explosive properties | Not explosive. |
| Oxidising properties | Not oxidising. |

9.2. Other information

| | |
|----------------|-------------------------------|
| Density | 8,10 - 8,40 g/cm ³ |
|----------------|-------------------------------|

SECTION 10: Stability and reactivity

| | |
|---|---|
| 10.1. Reactivity | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| 10.2. Chemical stability | Material is stable under normal conditions. |
| 10.3. Possibility of hazardous reactions | No dangerous reaction known under conditions of normal use. |
| 10.4. Conditions to avoid | Contact with incompatible materials. |
| 10.5. Incompatible materials | Strong bases. Strong oxidising agents. Halogens. |
| 10.6. Hazardous decomposition products | No hazardous decomposition products are known. |

SECTION 11: Toxicological information

| | |
|----------------------------|--|
| General information | Occupational exposure to the substance or mixture may cause adverse effects. |
|----------------------------|--|

Information on likely routes of exposure

| | |
|---------------------|---|
| Inhalation | Not likely, due to the form of the product. |
| Skin contact | Not likely, due to the form of the product. |
| Eye contact | Not likely, due to the form of the product. |
| Ingestion | Expected to be a low ingestion hazard. |

| | |
|-----------------|-------------|
| Symptoms | None known. |
|-----------------|-------------|

11.1. Information on toxicological effects

| | |
|--|---|
| Acute toxicity | None known. |
| Skin corrosion/irritation | Not classified. |
| Serious eye damage/eye irritation | Not likely, due to the form of the product. |
| Respiratory sensitisation | Not a respiratory sensitizer. |
| Skin sensitisation | Not a skin sensitiser. |
| Germ cell mutagenicity | Not classified. |
| Carcinogenicity | Not classified. |

Hungary. 26/2000 EüM Ordinance on protection against and preventing risk relating to exposure to carcinogens at work (as amended)

Not listed.

| | |
|---|---|
| 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. |
| Mixture versus substance information | No information available. |
| Other information | This product has no known adverse effect on human health. |

SECTION 12: Ecological information

| | |
|--|---|
| 12.1. Toxicity | No toxicity data noted for the ingredient(s). |
| 12.2. Persistence and degradability | No data is available on the degradability of this product. |
| 12.3. Bioaccumulative potential | No data available. |
| Partition coefficient n-octanol/water (log Kow) | Not applicable. |
| Bioconcentration factor (BCF) | Not available. |
| 12.4. Mobility in soil | No data available. |
| 12.5. Results of PBT and vPvB assessment | Not a PBT or vPvB substance or mixture. |
| 12.6. 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. |

SECTION 13: Disposal considerations

13.1. Waste treatment methods

| | |
|-------------------------------------|--|
| 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 | Empty containers should be taken to an approved waste handling site for recycling or disposal. |
| EU waste code | Not available. |
| Disposal methods/information | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. |
| Special precautions | Dispose in accordance with all applicable regulations. |

SECTION 14: Transport information

ADR

14.1. - 14.6.: Not regulated as dangerous goods.

RID

14.1. - 14.6.: Not regulated as dangerous goods.

ADN

14.1. - 14.6.: Not regulated as dangerous goods.

IATA

14.1. - 14.6.: Not regulated as dangerous goods.

IMDG

14.1. - 14.6.: Not regulated as dangerous goods.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended

Not listed.

Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

Not listed.

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.

Not listed.

Other EU regulations

Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended

Not listed.

Other regulations

The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended.

National regulations

Follow national regulation for work with chemical agents in accordance with Directive 98/24/EC, as amended.

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations

Not available.

References

Not available.

Information on evaluation method leading to the classification of mixture

Not applicable.

Training information

Follow training instructions when handling this material.

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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