

SAFETY DATA SHEET

1. Chemical Product and Company Identification

ProductName ZrO2 (Chip,Grain,Powder,Sheet,Tablet,Target, Code #:ZRO02GB,ZRO02PB,ZRO07PB)

Reference NO. ZRO02PAG-002

Creation Date 2026/03/26

Revision Date 2026/03/26

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Product Use For research purposes

Restriction of use Seek expert judgment when using the product for applications other than those recommended

2. Hazards identification

[GHS CLASSIFICATION]

PHYSICAL HAZARDS

Not Classification criteria.

HEALTH HAZARDS

Skin sensitizer : Category1

ENVIRONMENTAL HAZARDS

Not Classification criteria.

[GHS LABEL ELEMENTS]

Pictogram :



Signal Word : Warning

Hazard Statement : May cause an allergic skin reaction(H317)

Precautionary Statement

Safety measures : Avoid breathing dust/fume/gas/mist/vapours/spray.(P261)
: Contaminated work clothing should not be allowed out of the workplace.(P272)
: Wear protective gloves/protective clothing/eye protection/face protection.(P280)

First aid measures : Specific treatment.(P321)
: IF ON SKIN: Wash with plenty of water(P302+P352)
: If skin irritation or rash occurs: Get medical advice/attention. (P333+P313)
: Take off contaminated clothing and wash it before reuse. (P362+P364)

Storage : Not applicable

Disposal : Dispose of contents/container in accordance with local/regional/national/international regulation.(P501)

3. Composition/information on ingredients

Classification of the substance or mixture : Substance
 Chemical or generic name : Zirconium(IV) oxide

Chemical name	Concentration(%)	CAS RN®
Zirconium(IV) oxide	100.00	1314-23-4

4. First aid measures

- Inhalation : Remove the exposed person immediately and provide fresh air. Get medical attention.
- Skin contact : Promptly flush contaminated skin with soap or mild detergent and water. Contact Dermatologist if irritation continues.
- Eye contact : Rinse cautiously with water for 15 minutes. Get medical attention from an ophthalmologist. When washing your eyes, hold your eyelids open with your fingers to allow water to reach every corner of your eyeballs and eyelids.
- Ingestion : Rinse mouth and throat with water. Get medical attention immediately.
- Necessary precautions for protection of person performing first aid measures : Rescue workers wear appropriate eye and skin protection equipment according to the situation.
- Special precautions for doctors : The doctor should carry out treatment that corresponds to the patient's symptoms.

5. Fire fighting measures

- Suitable extinguishing media : Use media appropriate for surrounding fire.
- Unsuitable extinguishing media : If there are overlapping items between "Suitable extinguishing media" and "Unsuitable extinguishing media", the use of that extinguishing media is prohibited.
- Special hazards arising from the substance or mixture : In the case of powders, there is a risk of dust explosions due to surrounding heat or ignition sources.
- Special protective equipment and precautions for fire-fighters : Wear appropriate respiratory air and the protective clothing (heat resistance).

6. Accidental release measures

- Personal precautions, protective equipment and emergency procedures : Remove all ignition sources.
- : Workers should use protective wears to prevent contact with the spilt adhesive and inhalation of its vapor/dusts.
 Indoor leakage: Ventilate as much as possible until the cleaning is completed.
 Outdoor leakage: Work from the windward and evacuate the leeward crowd.
- Environmental precautions : Prevent flow out to river, etc. so as not to badly affect.
- Methods and material for containment and cleaning up : Shut off leak if without risk.
 Avoid unnecessary contacts with spills.
 : Gather up, pack in closed DOT-approved waste container as much as possible.
 Carefully collect remnant and move to a safe place.
- Measures to prevent secondary disasters : Prevent leakage into sewer, rivers and etc., and take measures to prevent environmental pollution.

7. Handling and storage

Handling

- Technical measures : No information available
- Precautions for safe handling : No information available
- Avoid contact : Use protective wears and local ventilation equipment, if inhalation or skin contact is foreseen.
Avoid prolonged or repeated exposure.
- Hygiene measures : Do not eat, drink or smoke when using this product.
: Wash hands thoroughly after handling.

Storage

- Safe storage conditions : Store the material in a sealed container.
Store in a cool, dry, well ventilated and dark place away from incompatible materials.
: Store molded products such as targets in an unopened condition.
- Safe container packaging materials : No information available

8. Exposure controls / Personal protection

Control parameters

Chemical name	ACGIH	OSHA
Zirconium(IV) oxide	TWA:5mg/m3 TWA:Zirconium [74-40-67-7] and compounds, as Zr STEL:10mg/m3 STEL:Zirconium [74-40-67-7] and compounds, as Zr	TWA:5mg/m3 TWA:Zirconium compounds as Zr

- Equipment : Install the appropriate general ventilation equipment, local exhaust ventilation in the workplace.
- Personal protection
- Respiratory protection : Wear appropriate NIOSH/MSHA-approved respirator.
- Hand protection : Wear appropriate NIOSH/MSHA-approved impervious gloves.
- Eye and face protection : Wear appropriate NIOSH/MSHA-approved safety goggles.
- Skin and body protection : Wear appropriate NIOSH/MSHA-approved impervious protective wear, protective boots.
- Special precautions : Regularly check your protective gear.
: The notes for the table are as follows.
D: Dust, M: Mist, F: Fumes, I: Inhalable particles, R: Respirable particles, IFV: Inhalable particles and vapors, T: Total dust, V: Vapors, C: Ceiling limit

9. Physical and chemical properties

- Physical state : Solid
- Color : White
- Odour : No information available
- Melting point/Freezing point : 2715°C
- Boiling point, initial boiling point and boiling range : ca.5000°C
- Flammability : Non-combustible
- Range of explosion (lower bound - upper bound) : No information available

Flash point	: No information available
Autoignition temperature	: No information available
Decomposition temperature	: No information available
pH	: No information available
Kinematic viscosity	: No information available
Solubility	: Insoluble in water(Soluble in sulfuric acid, hydrofluoric acid.)
Partition coefficient (n-octanol/water)	: No information available
Vapor pressure	: No information available
Density/Specific gravity	: 5.68g/cm ³
Relative vapor density	: No information available
Particle characteristics	: No information available
Other	: F.W. : 123.2 Oxidizing : None

10. Stability and reactivity

Reactivity	: No information available
Chemical stability	: Stable in closed container under dry atmosphere (at room temperature).
Possibility of hazardous reactions	: No information available
Conditions to avoid	: Keep away from direct sunlight. Store in a cool, dark place.
Incompatible materials	: No information available
Hazardous decomposition products	: No information available

11. Toxicological information

Acute toxicity(oral)	No information available
Acute toxicity(dermal)	No information available
Acute toxicity(inhalation:gases)	No information available
Acute toxicity(inhalation:vapours)	No information available
Acute toxicity(inhalation:dusts and mists)	No information available
Skin corrosion/Skin irritation	No information available
Serious eye damage/Eye Irritation	No information available
Respiratory sensitizer	No information available
Skin sensitizer	Zirconium(IV) oxide : Category1
Germ cell mutagenicity	No information available
Carcinogenicity	No information available

Toxic to reproduction/Effects on or via lactation

No information available

Specific target organ toxicity(single exposure)

No information available

Specific target organ toxicity(repeated exposure)

No information available

Aspiration hazard

No information available

12. Ecological information

Hazard to the aquatic environment (acute)

No information available

Hazard to the aquatic environment (chronic)

No information available

Hazardous to the ozone layer

No information available

Ecotoxicity/Fish toxicity

No information available

Ecotoxicity/ Invertebrate toxicity

No information available

Ecotoxicity/ Algal toxicity

No information available

Persistence and degradability

No information available

Bioaccumulative potential

No information available

Mobility in soil

No information available

13. Disposal considerations

Remained waste

: Discard in accordance with the standards of the local government and relevant legislation.

A polluted container and packing

: When disposing of empty containers, empty containers are processed in accordance with the standards of the local government as well as the related laws and regulations and waste disposal method after contents are completely removed.

14. Transport information

UN number

: No information available

Guideline Number

: -

Shipping name

: No information available

UN Class

: No information available

Packing group

: No information available

Subsidiary risk(s)

: -

MARINE POLLUTANT

: Not applicable

Transport in bulk according to MARPOL 73/78, Annex II, and the IBC code

: Not applicable

- Special safety measures for transport or means of transport : Follow "7. Handling and storage"
: Check no leak of container, handle without overturning, falling and damaging, then reliably prevent from cargo shift.
- Domestic regulations
- Ground transport : Follow the transportation method specified in the Fire Service Law and the Industrial Safety and Health Law.
 - Marine transport : Follow the transportation method specified in the Ship Safety Law.
 - Air transport : Follow the transportation method specified in the Aviation Law.

15. Regulatory information

Follow relevant national and local regulations.

16. Other information

This "Safety Data Sheet(SDS)" is for provision of information, and it does not represent a guarantee the properties or safeties of the product.

Since not all materials and literature have been investigated, information may be omitted, and changes may occur in the content due to the discovery of new findings or corrections of previous theories.

The information contained herein is based on information in our possession, but we do not guarantee the completeness of the information.

It is subject to revision based on changes in laws and regulations and new findings.

When using this information for important decisions, we recommend that you carefully review the source of the information or verify it through testing.

Values of ingredients, content, physicochemical properties, etc., are not quality assurance values.

Prior to use, please investigate the laws and regulations of the organization, area and country where the product is to be used.

The information is intended to ordinary usage, in case of special handling, sufficient care should be taken.

Special Notes (displayed only if applicable)