

# SAFETY DATA SHEET

Creation Date 6-May-2024

Revision Date 7-May-2024

Revision Number 2

## 1. Identification

**Product Name** Zirconium Oxide  
**Cat No. :** ZC3327  
**Synonyms** No information available  
**Recommended Use** Laboratory chemicals.  
**Uses advised against** Food, drug, pesticide or biocidal product use.

### Details of the supplier of the safety data sheet

#### Company

Stanford Advanced Materials  
23661 Birtcher Dr. Lake Forest,  
CA 92630 USA  
Tel: +1 (949) 407-8904

#### **Emergency Telephone Number**

+1 (949) 407-8904

## 2. Hazard(s) identification

### Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

|  |            |
|--|------------|
| Skin Corrosion/Irritation                        | Category 2 |
| Serious Eye Damage/Eye Irritation                | Category 2 |
| Specific target organ toxicity (single exposure) | Category 3 |
| Target Organs - Respiratory system.              |            |

### Label Elements

#### **Signal Word**

Warning

#### **Hazard Statements**

Causes serious eye irritation  
May cause respiratory irritation  
Causes skin irritation

**Precautionary Statements****Prevention**

Wash face, hands and any exposed skin thoroughly after handling

Wear eye/face protection

Avoid breathing dust/fume/gas/mist/vapors/spray

Use only outdoors or in a well-ventilated area

**Inhalation**

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

Call a POISON CENTER or doctor/physician if you feel unwell

**Skin**

IF ON SKIN: Wash with plenty of soap and water

If skin irritation occurs: Get medical advice/attention

Take off contaminated clothing and wash before reuse

**Eyes**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

If eye irritation persists: Get medical advice/attention

**Storage**

Store in a well-ventilated place. Keep container tightly closed

Store locked up

**Disposal**

Dispose of contents/container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)**

None identified

### 3. Composition/Information on Ingredients

| Component       | CAS No    | Weight % |
|-----------------|-----------|----------|
| Zirconium oxide | 1314-23-4 | 100      |

### 4. First-aid measures

|  |  |
|--|--|
| <b>Eye Contact</b>                         | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.  |
| <b>Skin Contact</b>                        | Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if symptoms occur.  |
| <b>Inhalation</b>                          | Remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention immediately if symptoms occur. |
| <b>Ingestion</b>                           | Do NOT induce vomiting. Get medical attention.   |
| <b>Most important symptoms and effects</b> | No information available.  |
| <b>Notes to Physician</b>                  | Treat symptomatically  |

### 5. Fire-fighting measures

**Unsuitable Extinguishing Media** No information available

**Flash Point Method -** No information available

**Autoignition Temperature** No information available

**Explosion Limits**

**Upper** No data available

**Lower** No data available

**Sensitivity to Mechanical Impact** No information available

**Sensitivity to Static Discharge** No information available

**Specific Hazards Arising from the Chemical**  
 Keep product and empty container away from heat and sources of ignition.

**Hazardous Combustion Products**  
 None under normal use conditions.

**Protective Equipment and Precautions for Firefighters**  
 As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

**NFPA**

|                    |                          |                         |                                |
|--------------------|--------------------------|-------------------------|--------------------------------|
| <b>Health</b><br>2 | <b>Flammability</b><br>0 | <b>Instability</b><br>0 | <b>Physical hazards</b><br>N/A |
|--------------------|--------------------------|-------------------------|--------------------------------|

**6. Accidental release measures**

**Personal Precautions** Ensure adequate ventilation. Use personal protective equipment as required.

**Environmental Precautions** Should not be released into the environment.

**Methods for Containment and Clean Up** Sweep up and shovel into suitable containers for disposal. Avoid dust formation.

**7. Handling and storage**

**Handling** Avoid contact with skin, eyes or clothing. Avoid ingestion and inhalation. Avoid breathing dust or spray mist. Minimize dust generation and accumulation. Wash hands before breaks and immediately after handling the product.

**Storage.** Keep containers tightly closed in a dry, cool and well-ventilated place. Incompatible Materials. Strong oxidizing agents.

**8. Exposure controls / personal protection**

**Exposure Guidelines** This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

| Component       | ACGIH TLV  | OSHA PEL   | NIOSH IDLH   | Mexico OEL (TWA)                                       |
|-----------------|--|--|--|--|
| Zirconium oxide | TWA: 5 mg/m <sup>3</sup><br>STEL: 10 mg/m <sup>3</sup> | (Vacated) TWA: 5 mg/m <sup>3</sup><br>(Vacated) STEL: 10 mg/m <sup>3</sup> | IDLH: 25 mg/m <sup>3</sup><br>TWA: 5 mg/m <sup>3</sup><br>STEL: 10 mg/m <sup>3</sup> | TWA: 5 mg/m <sup>3</sup><br>STEL: 10 mg/m <sup>3</sup> |

Legend

ACGIH - American Conference of Governmental Industrial Hygienists  
 OSHA - Occupational Safety and Health Administration  
 NIOSH IDLH: NIOSH - National Institute for Occupational Safety and Health

**Engineering Measures** Ensure adequate ventilation, especially in confined areas.

**Personal Protective Equipment**

|                                 |   |
|---------------------------------|---|
| <b>Eye/face Protection</b>      | Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.   |
| <b>Skin and body protection</b> | Wear appropriate protective gloves and clothing to prevent skin exposure.   |
| <b>Respiratory Protection</b>   | Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. |
| <b>Hygiene Measures</b>         | Handle in accordance with good industrial hygiene and safety practice.  |

## 9. Physical and chemical properties

|   |                          |
|---|--------------------------|
| <b>Physical State</b>                         | Solid                    |
| <b>Appearance</b>                             | White                    |
| <b>Odor</b>                                   | No information available |
| <b>Odor Threshold</b>                         | No information available |
| <b>pH</b>                                     |                          |
| <b>Melting Point/Range</b>                    | > 2500 °C                |
| <b>Boiling Point/Range</b>                    |                          |
| <b>Flash Point</b>                            |                          |
| <b>Evaporation Rate</b>                       | No information available |
| <b>Flammability (solid,gas)</b>               | No information available |
| <b>Flammability or explosive limits</b>       |                          |
| <b>Upper</b>                                  | No data available        |
| <b>Lower</b>                                  | No data available        |
| <b>Vapor Pressure</b>                         | No information available |
| <b>Vapor Density</b>                          | No information available |
| <b>Specific Gravity</b>                       | No information available |
| <b>Solubility</b>                             | Insoluble in water       |
| <b>Partition coefficient; n-octanol/water</b> | No data available        |
| <b>Autoignition Temperature</b>               | No information available |
| <b>Decomposition Temperature</b>              | No information available |
| <b>Viscosity</b>                              | No information available |
| <b>Molecular Formula</b>                      | ZrO <sub>2</sub>         |
| <b>Molecular Weight</b>                       | 123.2188                 |

## 10. Stability and reactivity

|   |  |
|---|--|
| <b>Reactive Hazard</b>                  | None known, based on information available   |
| <b>Stability</b>                        | Stable under normal conditions.              |
| <b>Conditions to Avoid</b>              | Avoid dust formation. Incompatible products. |
| <b>Incompatible Materials</b>           | Strong oxidizing agents                      |
| <b>Hazardous Decomposition Products</b> | None under normal use conditions             |
| <b>Hazardous Polymerization</b>         | Hazardous polymerization does not occur.     |
| <b>Hazardous Reactions</b>              | None under normal processing.                |

## 11. Toxicological information

### Acute Toxicity

#### Component Information

| Component | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|-----------|-----------|-------------|-----------------|
|           |           |             |                 |

|                 |            |            |                             |
|-----------------|------------|------------|-----------------------------|
| Zirconium oxide | Not listed | Not listed | LC50 > 4.3 mg/L ( Rat ) 4 h |
|-----------------|------------|------------|-----------------------------|

**Toxicologically Synergistic Products** No information available

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Irritation** Irritating to eyes, respiratory system and skin

**Sensitization** No information available

**Carcinogenicity** The table below indicates whether each agency has listed any ingredient as a carcinogen.

| Component       | CAS No    | IARC       | NTP        | ACGIH      | OSHA       | Mexico     |
|-----------------|-----------|------------|------------|------------|------------|------------|
| Zirconium oxide | 1314-23-4 | Not listed | Not listed | Not listed | Not listed | Not listed |

**Mutagenic Effects** No information available

**Reproductive Effects** No information available.

**Developmental Effects** No information available.

**Teratogenicity** No information available.

**STOT - single exposure** Respiratory system  
**STOT - repeated exposure** None known

**Aspiration hazard** No information available

**Symptoms / effects, both acute and delayed** No information available

**Endocrine Disruptor Information** No information available

**Other Adverse Effects** The toxicological properties have not been fully investigated.

## 12. Ecological information

### Ecotoxicity

Do not empty into drains.

| Component       | Freshwater Algae | Freshwater Fish                            | Microtox   | Water Flea |
|-----------------|------------------|--|------------|------------|
| Zirconium oxide | Not listed       | LC50: > 100 mg/L, 96h static (Danio rerio) | Not listed | Not listed |

**Persistence and Degradability** No information available

**Bioaccumulation/ Accumulation** No information available.

**Mobility** No information available.

## 13. Disposal considerations

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

## 14. Transport information

**DOT** Not regulated  
**TDG** Not regulated  
**IATA** Not regulated  
**IMDG/IMO** Not regulated

## 15. Regulatory information

### United States of America Inventory

| Component       | CAS No    | TSCA | TSCA Inventory notification - Active-Inactive | TSCA - EPA Regulatory Flags |
|-----------------|-----------|------|---|-----------------------------|
| Zirconium oxide | 1314-23-4 | X    | ACTIVE  | -                           |

#### Legend:

**TSCA** US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

X - Listed

'-' - Not Listed

**TSCA 12(b)** - Notices of Export      Not applicable

### International Inventories

Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

| Component       | CAS No    | DSL | NDSL | EINECS    | PICCS | ENCS | ISHL | AICS | IECSC | KECL     |
|-----------------|-----------|-----|------|-----------|-------|------|------|------|-------|----------|
| Zirconium oxide | 1314-23-4 | X   | -    | 215-227-2 | X     | X    | X    | X    | X     | KE-35630 |

KECL - NIER number or KE number (<http://ncis.nier.go.kr/en/main.do>)

### U.S. Federal Regulations

|   |   |
|---|---|
| <b>SARA 313</b>   | Not applicable  |
| <b>SARA 311/312 Hazard Categories</b>                       | See section 2 for more information                          |
| <b>CWA (Clean Water Act)</b>                                | Not applicable  |
| <b>Clean Air Act</b>  | Not applicable  |
| <b>OSHA - Occupational Safety and Health Administration</b> | Not applicable  |
| <b>CERCLA</b>   | Not applicable  |
| <b>California Proposition 65</b>                            | This product does not contain any Proposition 65 chemicals. |
| <b>U.S. State Right-to-Know Regulations</b>                 | Not applicable  |

| Component       | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island |
|-----------------|---------------|------------|--------------|----------|--------------|
| Zirconium oxide | X             | -          | -            | -        | X            |

### U.S. Department of Transportation

|                             |   |
|-----------------------------|---|
| Reportable Quantity (RQ):   | N |
| DOT Marine Pollutant        | N |
| DOT Severe Marine Pollutant | N |

**U.S. Department of Homeland Security**      This product does not contain any DHS chemicals.

### Other International Regulations

**Mexico - Grade**      No information available

## Authorisation/Restrictions according to EU REACH

| Component       | REACH (1907/2006) - Annex XIV - Substances Subject to Authorization | REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances | REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC) |
|-----------------|---|---|---|
| Zirconium oxide | -   | Use restricted. See item 75. (see link for restriction details)               | -   |

<https://echa.europa.eu/substances-restricted-under-reach>

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

| Component       | CAS No    | OECD HPV | Persistent Organic Pollutant | Ozone Depletion Potential | Restriction of Hazardous Substances (RoHS) |
|-----------------|-----------|----------|------------------------------|---------------------------|--|
| Zirconium oxide | 1314-23-4 | Listed   | Not applicable               | Not applicable            | Not applicable                             |

| Component       | CAS No    | Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification | Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements | Rotterdam Convention (PIC) | Basel Convention (Hazardous Waste) |
|-----------------|-----------|---|--|----------------------------|------------------------------------|
| Zirconium oxide | 1314-23-4 | Not applicable  | Not applicable   | Not applicable             | Not applicable                     |

## 16. Other information

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**Revision Summary** This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of SDS**