SAFETY DATA SHEET
Zirconium Oxide (powder and pieces)

1. Identification

- **Product identifier**
  - **Product name**: Zirconium Oxide (powder and pieces)
  - **Internal identification**: Replaces M-2200-340, M-2200-341
  - **CAS number**: 1314-23-4

**Recommended use of the chemical and restrictions on use**
- **Application**: Exterior surface coating.
- **Uses advised against**: No specific uses advised against are identified.

**Details of the supplier of the safety data sheet**
- **Supplier**: Kurt J Lesker Company
- **Manufacturer**: Kurt J Lesker Company
  1925 Route 51
  Jefferson Hills, PA 15025
  +1 412-387-9200

  Kurt J Lesker Company LTD
  United Kingdom
  15-16 Burgess Road
  Hastings, East Sussex, TN35 4NR
  England
  Customer Service: +44 (0) 1424 458100
  msds@lesker.com

**Emergency telephone number**
- **Emergency telephone**
  - North America [USA, Canada, Mexico]: 1-866-519-4752
  - Mainland China: (+86) 4001 2001 74
  - Europe: (int'l call prefix)-1-760-476-3961
  - Asia Pacific: (int'l call prefix)-1-760-476-3960
  - Middle East & Africa: (int'l call prefix)-1-760-476-3959
  - South Korea: (+82) 070 4732 5813
  - Philippines: (+63) 2 83953471

Access Code - 333594

2. Hazard(s) identification

**Classification of the substance or mixture**
- **Physical hazards**: Not Classified
- **Health hazards**: Not Classified
- **Environmental hazards**: Not Classified
Zirconium Oxide (powder and pieces)

**Label elements**

**Hazard statements** NC Not Classified

**Other hazards**

This product does not contain any substances classified as PBT or vPvB. Based on available knowledge of this material, it has been determined to be non-hazardous and will not pose a risk to persons or the environment in its provided form. However, any cutting, welding, melting, grinding, or use for deposition will produce dust, fume, or particulates containing component elements of this material. Exposure to these components may present significant health hazards. Note: Fine particulate may be a combustible dust which, when dispersed in air, may present an explosion hazard.

**3. Composition/information on ingredients**

**Mixtures**

<table>
<thead>
<tr>
<th>Zirconium Oxide (powder and pieces)</th>
<th>0 - 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number: 1314-23-4</td>
<td></td>
</tr>
</tbody>
</table>

**Classification**

Not Classified

The full text for all hazard statements is displayed in Section 16.

**4. First-aid measures**

**Description of first aid measures**

**General information**

If in doubt, get medical attention promptly. Show this Safety Data Sheet to the medical personnel.

**Inhalation**

No specific recommendations. If throat irritation or coughing persists, proceed as follows. Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Loosen tight clothing such as collar, tie or belt. Get medical attention if any discomfort continues.

**Ingestion**

No specific recommendations. If throat irritation or coughing persists, proceed as follows. Rinse mouth. Get medical attention if any discomfort continues.

**Skin Contact**

No specific recommendations. Rinse with water. Get medical attention if any discomfort continues.

**Eye contact**

Rinse with water. Get medical attention if any discomfort continues.

**Protection of first aiders**

Use protective equipment appropriate for surrounding materials.

**Most important symptoms and effects, both acute and delayed**

**General information**

The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

**Inhalation**

No specific symptoms known.

**Ingestion**

No specific symptoms known. May cause discomfort if swallowed.

**Skin contact**

Prolonged contact may cause dryness of the skin.

**Eye contact**

No specific symptoms known. May be slightly irritating to eyes.

**Indication of immediate medical attention and special treatment needed**

**Notes for the doctor**

Treat symptomatically.

**Specific treatments**

No special treatment required.
Zirconium Oxide (powder and pieces)

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media
The product is not flammable. Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog. Use fire-extinguishing media suitable for the surrounding fire.

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

Special hazards arising from the substance or mixture

Specific hazards
None known.

Hazardous combustion products
Thermal decomposition or combustion products may include the following substances: Harmful gases or vapors.

Advice for firefighters

Protective actions during firefighting
Avoid breathing fire gases or vapors. Evacuate area. Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out.

Special protective equipment for firefighters
Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Standard Firefighter's clothing including helmets, protective boots and gloves will provide a basic level of protection for chemical incidents.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions
No specific recommendations. For personal protection, see Section 8.

Environmental precautions

Environmental precautions
Avoid discharge into drains or watercourses or onto the ground.

Methods and material for containment and cleaning up

Methods for cleaning up
Reuse or recycle products wherever possible. Collect spillage with a shovel and broom, or similar and reuse, if possible. Collect and place in suitable waste disposal containers and seal securely. Flush contaminated area with plenty of water. Wash thoroughly after dealing with a spillage. Dispose of contents/container in accordance with national regulations.

Reference to other sections
For personal protection, see Section 8.

7. Handling and storage

Precautions for safe handling

Usage precautions
Read and follow manufacturer's recommendations. Wear protective clothing as described in Section 8 of this safety data sheet. Keep away from food, drink and animal feeding stuffs. Keep container tightly sealed when not in use.

Advice on general occupational hygiene
Wash promptly if skin becomes contaminated. Take off contaminated clothing and wash before reuse. Wash contaminated clothing before reuse.

Conditions for safe storage, including any incompatibilities

Storage precautions
No specific recommendations.

Storage class
Unspecified storage.

Specific end use(s)
The identified uses for this product are detailed in Section 1.
**Zirconium Oxide (powder and pieces)**

### 8. Exposure controls/Personal protection

#### Exposure controls

| No specific ventilation requirements. |

#### Eye/face protection

| No specific eye protection required during normal use. Large Spillages: Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. |

#### Hand protection

| No specific hand protection recommended. Large Spillages: Wear protective gloves. |

#### Hygiene measures

| Wash hands thoroughly after handling. Wash at the end of each work shift and before eating, smoking and using the toilet. Do not eat, drink or smoke when using this product. |

#### Respiratory protection

| No specific recommendations. Provide adequate ventilation. Large Spillages: If ventilation is inadequate, suitable respiratory protection must be worn. |

#### Environmental exposure controls

| Not regarded as dangerous for the environment. |

### 9. Physical and chemical properties

#### Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Solid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>White.</td>
</tr>
<tr>
<td>Odor</td>
<td>No characteristic odor.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Melting point</td>
<td>2715°C</td>
</tr>
<tr>
<td>Initial boiling point and range</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>5.68 @ 25°C</td>
</tr>
<tr>
<td>Bulk density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>Insoluble in water.</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>123.218</td>
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### Zirconium Oxide (powder and pieces)

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<tr>
<td><strong>Stability</strong></td>
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<tr>
<td><strong>Possibility of hazardous reactions</strong></td>
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<td><strong>Conditions to avoid</strong></td>
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<tr>
<td><strong>Materials to avoid</strong></td>
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<td><strong>Hazardous decomposition products</strong></td>
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<table>
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<tr>
<th>11. Toxicological information</th>
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<td><strong>Information on toxicological effects</strong></td>
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<tr>
<td><strong>Toxicological effects</strong></td>
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<tr>
<td><strong>Acute toxicity - oral</strong></td>
</tr>
<tr>
<td>Notes (oral LD₅₀)</td>
</tr>
<tr>
<td><strong>Acute toxicity - dermal</strong></td>
</tr>
<tr>
<td>Notes (dermal LD₅₀)</td>
</tr>
<tr>
<td><strong>Acute toxicity - inhalation</strong></td>
</tr>
<tr>
<td>Notes (inhalation LC₅₀)</td>
</tr>
<tr>
<td><strong>Skin corrosion/irritation</strong></td>
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<tr>
<td>Animal data</td>
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<tr>
<td><strong>Serious eye damage/irritation</strong></td>
</tr>
<tr>
<td><strong>Respiratory sensitization</strong></td>
</tr>
<tr>
<td><strong>Skin sensitization</strong></td>
</tr>
<tr>
<td><strong>Germ cell mutagenicity</strong></td>
</tr>
<tr>
<td><strong>Genotoxicity - in vitro</strong></td>
</tr>
<tr>
<td><strong>Carcinogenicity</strong></td>
</tr>
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<td><strong>IARC carcinogenicity</strong></td>
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<tr>
<td><strong>Reproductive toxicity</strong></td>
</tr>
<tr>
<td><strong>Reproductive toxicity - fertility</strong></td>
</tr>
<tr>
<td><strong>Reproductive toxicity - development</strong></td>
</tr>
<tr>
<td><strong>Specific target organ toxicity - single exposure</strong></td>
</tr>
</tbody>
</table>

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Zirconium Oxide (powder and pieces)

**STOT - single exposure**
Not classified as a specific target organ toxicant after a single exposure.

**Specific target organ toxicity - repeated exposure**

**STOT - repeated exposure**
Not classified as a specific target organ toxicant after repeated exposure.

**Aspiration hazard**
Not relevant. Solid.

**General information**
No specific health hazards known. The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

**Inhalation**
No specific symptoms known.

**Ingestion**
No specific symptoms known. May cause discomfort if swallowed.

**Skin Contact**
Prolonged contact may cause dryness of the skin.

**Eye contact**
No specific symptoms known. May be slightly irritating to eyes.

**Route of exposure**
Ingestion Inhalation Skin and/or eye contact

**Target Organs**
No specific target organs known.

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**12. Ecological information**

**Ecotoxicity**
Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment.

**Toxicity**
Based on available data the classification criteria are not met.

**Persistence and degradability**

**Persistence and degradability**
The degradability of the product is not known.

**Bioaccumulative potential**

**Bio-Accumulative Potential**
No data available on bioaccumulation.

**Partition coefficient**
Not applicable.

**Mobility in soil**

**Mobility**
No data available.

**Other adverse effects**

**Other adverse effects**
None known.

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**13. Disposal considerations**

**Waste treatment methods**

**General information**
The generation of waste should be minimized or avoided wherever possible. Reuse or recycle products wherever possible. This material and its container must be disposed of in a safe way.

**Disposal methods**
Dispose of surplus products and those that cannot be recycled via a licensed waste disposal contractor. Waste packaging should be collected for reuse or recycling. Incineration or landfill should only be considered when recycling is not feasible. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of the local water authority.

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**14. Transport information**
Zirconium Oxide (powder and pieces)

General
The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, DOT).

UN Number
UN No. (International) Not applicable.

UN proper shipping name
Proper shipping name (International) Not applicable.

Transport hazard class(es)
Transport Labels (International) No transport warning sign required.

Packing group
Packing group (International) Not applicable.

Environmental hazards
Environmentally Hazardous Substance No.

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

US Federal Regulations
SARA Section 302 Extremely Hazardous Substances Tier II Threshold Planning Quantities
None of the ingredients are listed or exempt.

CERCLA/Superfund, Hazardous Substances/Reportable Quantities (EPA)
None of the ingredients are listed or exempt.

SARA Extremely Hazardous Substances EPCRA Reportable Quantities
None of the ingredients are listed or exempt.

SARA 313 Emission Reporting
None of the ingredients are listed or exempt.

CAA Accidental Release Prevention
None of the ingredients are listed or exempt.

FDA - Essential Chemical
None of the ingredients are listed or exempt.

FDA - Precursor Chemical
None of the ingredients are listed or exempt.

SARA (311/312) Hazard Categories
None of the ingredients are listed or exempt.
Zirconium Oxide (powder and pieces)

OSHA  Highly Hazardous Chemicals
None of the ingredients are listed or exempt.

US State Regulations
California Proposition 65 Carcinogens and Reproductive Toxins
None of the ingredients are listed or exempt.

California Air Toxics "Hot Spots" (A-I)
None of the ingredients are listed or exempt.

California Air Toxics "Hot Spots" (A-II)
None of the ingredients are listed or exempt.

California Directors List of Hazardous Substances
None of the ingredients are listed or exempt.

Massachusetts "Right To Know" List
None of the ingredients are listed or exempt.

Rhode Island "Right To Know" List
None of the ingredients are listed or exempt.

Minnesota "Right To Know" List
None of the ingredients are listed or exempt.

New Jersey "Right To Know" List
None of the ingredients are listed or exempt.

Pennsylvania "Right To Know" List
None of the ingredients are listed or exempt.

Inventories
US - TSCA
None of the ingredients are listed or exempt.

US - TSCA 12(b) Export Notification
None of the ingredients are listed or exempt.

16. Other information

<table>
<thead>
<tr>
<th>Training advice</th>
<th>Only trained personnel should use this material.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision date</td>
<td>9/27/2019</td>
</tr>
<tr>
<td>Revision</td>
<td>5</td>
</tr>
<tr>
<td>Supersedes date</td>
<td>3/16/2017</td>
</tr>
<tr>
<td>SDS No.</td>
<td>4648</td>
</tr>
<tr>
<td>End of SDS</td>
<td></td>
</tr>
</tbody>
</table>

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