Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product Identifier

Product Name: Yttria Stabilized Zirconia
Synonyms: YSZ, Yttrium stabilized zirconium oxide, Zirconium(IV) oxide - yttria stabilized

1.2. Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

Recommended Use: Laboratory chemicals and manufacture of substances

1.3. Details of the Supplier of the Safety Data Sheet

Supplier: Nexceris, LLC
404 Enterprise Dr.
Lewis Center, OH 43035
www.nexceris.com

For further information, please contact

Contact Point: Non-emergency calls/questions: 1-614-842-6606
Fax: 1-614-842-6607
Email Address: info@nexceris.com

1.4. Emergency telephone number

Emergency Telephone (24 hr): INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

Section 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Regulation (EC) No 1272/2008
Not classified as dangerous according to Regulation (EC) No. 1272/2008.

Classification according to 67/548/EEC
Full text of R-phrases: see section 16

Hazard Symbols
Not dangerous

2.2. Label Elements

Not classified as dangerous according to Regulation (EC) No. 1272/2008.

Signal Word
None

EUH210 - Safety data sheet available on request

2.3. Other Hazards

General Hazards
None known
Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>EC No</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>Classification according to 67/548/EEC</th>
<th>Classification according to Regulation (EC) No. 1272/2008 [CLP]</th>
<th>REACH Registration Number</th>
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<tbody>
<tr>
<td>Zirconium Oxide</td>
<td>Present</td>
<td>1314-23-4</td>
<td>78-94</td>
<td>-</td>
<td>Not determined</td>
<td>Not determined</td>
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<tr>
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<td>1-2</td>
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<td>Not determined</td>
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<tr>
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<td>1344-28-1</td>
<td>0-3</td>
<td>-</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
</tbody>
</table>

Full text of R-phrases: see section 16

Full text of H- and EUH-phrases: see section 16

Additional Information
Substances without a classification are included, because they have established occupational exposure limits

Section 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

Eye Contact
Rinse immediately with plenty of water and seek medical advice.

Skin Contact
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.

Inhalation
Remove to fresh air.

Ingestion
Clean mouth with water and drink afterwards plenty of water.

4.2. Most Important Symptoms and Effects, Both Acute and Delayed

Symptoms
None known.

4.3. Indication of any Immediate Medical Attention and Special Treatment Needed

Notes to Physician
Treat symptomatically.

Section 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media
Not determined.

5.2. Special Hazards Arising from the Substance or Mixture

Product is not flammable.

5.3. Advice for Firefighters

Wear self-contained breathing apparatus and protective suit. Use personal protective equipment as required.
Section 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions
Use personal protective equipment as required. Avoid creating dust.

For Emergency Responders
Use personal protection recommended in Section 8.

6.2. Environmental Precautions

Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

6.3. Methods and Material for Containment and Cleaning Up

Methods for Containment
Prevent further leakage or spillage if safe to do so.

Methods for Clean-up
Place in appropriate containers for disposal.

6.4. Reference to Other Sections

See Section 13: DISPOSAL CONSIDERATIONS.

Section 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Advice on Safe Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Avoid generation of dust.

General Hygiene Considerations
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for Safe Storage, Including any Incompatibilities

Storage Conditions
Keep container tightly closed and store in a cool, dry and well-ventilated place.

7.3. Specific End Use(s)

Specific Use(s)
Laboratory chemicals and Manufacture of substances.

Risk Management Methods (RMM)
The information required is contained in this Safety Data Sheet.
Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

Exposure Limits

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>European Union</th>
<th>United Kingdom</th>
<th>France</th>
<th>Spain</th>
<th>Germany</th>
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<tr>
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<td>TWA: 5 mg/m³</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1314-23-4</td>
<td></td>
<td>STEL: 10 mg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yttrium Oxide</td>
<td></td>
<td>TWA: 1 mg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1314-36-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hafnium Oxide</td>
<td></td>
<td>TWA: 0.5 mg/m³</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>12055-23-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td></td>
<td>TWA: 10 mg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1344-28-1</td>
<td></td>
<td>TWA: 4 mg/m³</td>
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<td></td>
</tr>
</tbody>
</table>

Component

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Austria</th>
<th>Switzerland</th>
<th>Poland</th>
<th>Norway</th>
<th>Ireland</th>
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<tbody>
<tr>
<td>Zirconium Oxide</td>
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<td>TWA: 5 mg/m³</td>
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</tr>
<tr>
<td>1314-23-4</td>
<td>STEL: 10 mg/m³</td>
<td>STEL: 10 mg/m³</td>
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<td></td>
</tr>
<tr>
<td>Yttrium Oxide</td>
<td>TWA: 1 mg/m³</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1314-36-9</td>
<td>STEL: 10 mg/m³</td>
<td>STEL: 10 mg/m³</td>
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</tr>
<tr>
<td>Hafnium Oxide</td>
<td>TWA: 0.5 mg/m³</td>
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</tr>
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<td>STEL 24 mg/m³</td>
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<td>TWA: 3 mg/m³</td>
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</tr>
</tbody>
</table>

8.2. Exposure Controls

Engineering Controls

Apply technical measures to comply with the occupational exposure limits.

Personal Protective Equipment

Eye/Face Protection
Avoid contact with eyes.

Hand Protection
Gloves are not required for normal use.

Skin and Body Protection
Suitable protective clothing.

Respiratory Protection
Ensure adequate ventilation, especially in confined areas. In case of inadequate ventilation wear respiratory protection.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks • Method</th>
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</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Solid</td>
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<tr>
<td>Appearance</td>
<td>White solid</td>
<td>Odour</td>
</tr>
<tr>
<td>Colour</td>
<td>White</td>
<td>Odour Threshold</td>
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<tr>
<td>pH</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>Melting Point/Freezing Point</td>
<td>~ 2500 °C / ~4530 °F</td>
<td></td>
</tr>
<tr>
<td>Boiling Point/Boiling Range</td>
<td>~ 3800 °C / ~6870</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
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<td></td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>Flammability (Solid, Gas)</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>Flammability Limits in Air</td>
<td>Not flammable</td>
<td></td>
</tr>
</tbody>
</table>
Upper Flammability Limits: Not determined
Lower Flammability Limit: Not determined
Vapour Pressure: Not determined
Vapour Density: Not determined
Relative Density: Not determined
Water Solubility: Practically insoluble
Solubility(ies): Not determined
Partition Coefficient: Not determined
Auto-ignition Temperature: Not determined
Decomposition Temperature: Not determined
Kinematic Viscosity: Not determined
Dynamic Viscosity: Not determined
Explosive Properties: Not determined
Oxidizing Properties: Not determined

Section 10: STABILITY AND REACTIVITY

10.1. Reactivity
Not reactive under normal conditions.

10.2. Chemical stability
Stable under normal conditions.

10.3. Possibility of Hazardous Reactions

Possibility of Hazardous Reactions
None under normal processing.

10.4. Conditions to Avoid
Keep out of reach of children. Avoid generation of dust.

10.5. Incompatible Materials
None known based on information supplied.

10.6. Hazardous Decomposition Products
None under normal use conditions.

Section 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects
Acute Toxicity

Product Information

Eye Contact: Avoid contact with eyes.
Skin Contact: Avoid contact with skin.
Inhalation: Avoid inhalation of dust.
Ingestion: Do not ingest.
Unknown Acute Toxicity

100% of the mixture consists of ingredient(s) of unknown toxicity.

The following values are calculated based on chapter 3.1 of the GHS document:

| Oral LD50 | 99,999.00 | mg/kg |
| Dermal LD50 | 99,999.00 | mg/kg |
| Gas | 99,999.00 | mg/L |
| Mist | 99,999.00 | mg/L |
| Vapor | 99,999.00 | mg/L |

Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
--- | --- | --- | --- |
Aluminum Oxide | > 5000 mg/kg (Rat) | | |

Skin corrosion/irritation
Not classified.

Serious eye damage/eye irritation
Not classified.

Sensitization
Not classified.

Germ cell mutagenicity
Not classified.

Carcinogenicity
None known based on information supplied.

Reproductive toxicity
Not classified.

STOT - single exposure
Not classified.

STOT - repeated exposure
Not classified.

Aspiration hazard
Not classified.

Symptoms
Please see section 4 of this SDS for symptoms.

Section 12: ECOLOGICAL INFORMATION

12.1. Toxicity
Not determined.

12.2. Persistence and Degradability
Not determined.

12.3. Bioaccumulative Potential
Not determined.
12.4. Mobility in Soil

Mobility
Not determined.

12.5. Results of PBT and vPvB Assessment

Not determined.

12.6. Other Adverse Effects

Not determined.

Section 13: DISPOSAL CONSIDERATIONS

13.1. Waste Treatment Methods

Waste from Residues / Unused Products
Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging
Improper disposal or reuse of this container may be dangerous and illegal.

Section 14: TRANSPORT INFORMATION

IMDG
14.2  Proper Shipping Name
Not regulated

RID
14.2  Proper Shipping Name
Not regulated

ADR
14.2  Proper Shipping Name
Not regulated

ICAO (air)
14.2  Proper Shipping Name
Not regulated

IATA
14.2  Proper Shipping Name
Not regulated

Section 15: REGULATORY INFORMATION

15.1. Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

European Union
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.

International Inventories
Not determined.
NT-001-EU - Yttria Stabilized Zirconia

**Legend**
- TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
- EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
- DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
- PICCS - Philippines Inventory of Chemicals and Chemical Substances
- ENCS - Japan Existing and New Chemical Substances
- IECSC - China Inventory of Existing Chemical Substances
- AICS - Australian Inventory of Chemical Substances
- KECL - Korean Existing and Evaluated Chemical Substances

**15.2. Chemical Safety Assessment**

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

Section 16: OTHER INFORMATION

**Full text of R-phrases referred to under sections 2 and 3**
Not applicable

**Full text of H-Statements referred to under sections 2 and 3**
Not applicable

**Classification Procedure**
Calculation method

**Issue Date:** 03-Dec-2014

**Revision Date:** 01-Oct-2015

**Revision Note:** Company name change

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006, as amended by Regulation (EU) No. 453/2010

**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 Safety Data Sheet