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

1.1 Product identifier
- Trade name: Ceria Zirconia
- Product code: 9994, #222

1.2 Relevant identified uses of the substance or mixture and uses advised against
- No further relevant information available.

1.3 Details of the supplier of the Safety Data Sheet
- Manufacturer/Supplier: Saint Gobain Coating Solutions
  One New Bond Street
  Worcester, MA 01615-0137
  (508) 795-5000
  CeramicMaterials@saint-gobain.com

1.4 Emergency telephone number:
- CHEMTREC
  1-800-424-9300 (US/Canada)
  +01 703-527-3887 (International)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
- Classification according to Regulation (EC) No 1272/2008
  The product is not classified as hazardous according to OSHA GHS regulations within the United States.
  The product is not classified as hazardous according to the CLP regulation.

- Additional information:
  Not hazardous as delivered. Long term inhalation of product dusts formed during use is harmful.

2.2 Label elements
- Labelling according to Regulation (EC) No 1272/2008
  This product does not have a classification according to the CLP regulation.
  The product is not classified as hazardous according to OSHA GHS regulations within the United States.
- Hazard pictograms Not Regulated
- Signal word Not Regulated

2.3 Other hazards
- Hazard-determining components of labelling: None.
- Hazard statements Not Regulated
- Precautionary statements Not Regulated.
- There are no other hazards not otherwise classified that have been identified.
  0 % of the mixture consists of component(s) of unknown toxicity.

(Cont’d. on page 2)
SECTION 3: Composition/information on ingredients

- **3.2 Mixtures**
  - **Dangerous components:**
    - CAS: 1314-23-4, EINECS: 215-227-2: zirconium dioxide substance with a Community workplace exposure limit 70-80%

- **Additional information:**
  For the listed ingredient(s), the identity and exact percentages are being withheld as a trade secret.

SECTION 4: First aid measures

- **4.1 Description of first aid measures**
  - **After inhalation:**
    Supply fresh air; consult doctor in case of complaints.
    Provide oxygen treatment if affected person has difficulty breathing.

  - **After skin contact:**
    Brush off loose particles from skin.
    Immediately rinse with water.
    If skin irritation is experienced, consult a doctor.

  - **After eye contact:**
    Remove contact lenses if worn, if possible.
    Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

  - **After swallowing:**
    Rinse out mouth and then drink plenty of water.
    Do not induce vomiting; call for medical help immediately.

- **4.2 Most important symptoms and effects, both acute and delayed**
  - Breathing difficulty
  - Coughing
  - Slight irritant effect on skin and mucous membranes.
  - Slight irritant effect on eyes.
  - May cause gastro-intestinal irritation if ingested.

- **Hazards**
  - No further relevant information available.

- **4.3 Indication of any immediate medical attention and special treatment needed**
  - No further relevant information available.
SECTION 5: Firefighting measures

- 5.1 Extinguishing media
- Suitable extinguishing agents:
  The product is not flammable.
  Use fire extinguishing methods suitable to surrounding conditions.
- For safety reasons unsuitable extinguishing agents: None.
- 5.2 Special hazards arising from the substance or mixture No further relevant information available.
- 5.3 Advice for firefighters
- Protective equipment:
  Wear self-contained respiratory protective device.
  Wear fully protective suit.
- Additional information No further relevant information available.

SECTION 6: Accidental release measures

- 6.1 Personal precautions, protective equipment and emergency procedures
  Ensure adequate ventilation
  Do not breathe dust.
  Avoid formation of dust.
  For large spills, use respiratory protective device against the effects of fumes/dust/aerosol.
- 6.2 Environmental precautions:
  Damp down dust with water spray.
  Avoid release to the environment.
- 6.3 Methods and material for containment and cleaning up:
  Pick up mechanically.
  Dispose of the material collected according to regulations.
  Send for recovery or disposal in suitable receptacles.
- 6.4 Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.

SECTION 7: Handling and storage

- 7.1 Precautions for safe handling
  Use only in well ventilated areas.
  Prevent formation of dust.
  Any unavoidable deposit of dust must be regularly removed.
  Use personal protective equipment as required.
- Information about fire - and explosion protection: No special measures required.
- 7.2 Conditions for safe storage, including any incompatibilities
- Storage:
  Requirements to be met by storerooms and receptacles: Store in a cool location.
  Information about storage in one common storage facility: Store away from foodstuffs.
  Further information about storage conditions: Keep container tightly sealed.

(Cont'd. from page 2)

(Cont'd. on page 4)


SECTION 8: Exposure controls/personal protection

- Additional information about design of technical facilities: No further data; see section 7.
- 8.1 Control parameters

<table>
<thead>
<tr>
<th>Ingredients with limit values that require monitoring at the workplace:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1314-23-4 zirconium dioxide</strong></td>
</tr>
<tr>
<td>PEL (USA)</td>
</tr>
<tr>
<td>REL (USA)</td>
</tr>
<tr>
<td>TLV (USA)</td>
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<tr>
<td>EL (Canada)</td>
</tr>
<tr>
<td><strong>12055-23-1 hafnium dioxide</strong></td>
</tr>
<tr>
<td>PEL (USA)</td>
</tr>
<tr>
<td>REL (USA)</td>
</tr>
<tr>
<td>TLV (USA)</td>
</tr>
<tr>
<td>EL (Canada)</td>
</tr>
</tbody>
</table>

- DNELs No further relevant information available.
- PNECs No further relevant information available.

8.2 Exposure controls

- Personal protective equipment:
  - General protective and hygienic measures:
    The usual precautionary measures are to be adhered to when handling chemicals. Keep away from foodstuffs, beverages and feed. Avoid breathing dust. Avoid contact with the eyes. Avoid close or long term contact with the skin.
  - Respiratory protection:
    Wear appropriate NIOSH respirator when ventilation is inadequate and occupational exposure limits are exceeded. Use suitable respiratory protective device in case of insufficient ventilation. Use respiratory protection when grinding or cutting material. Particulate mask should filter at least 99% of airborne particles.
SECTION 9: Physical and chemical properties

- 9.1 Information on basic physical and chemical properties
- General Information
- Appearance:
  - Form: Crystalline powder
  - Colour: Tan.
- Odour: Odourless
- Odour threshold: Not determined.
- pH-value: Not applicable.
- Change in condition
  - Melting point/Melting range: Not determined.
  - Boiling point/Boiling range: 2300 °C (4172 °F)
- Flash point: Not applicable.
- Flammability (solid, gaseous): Product is not flammable.
- Auto/Self-ignition temperature: Not determined.
- Decomposition temperature: Not determined.
- Self-igniting: Not determined.
- Danger of explosion: Product does not present an explosion hazard.
- Explosion limits:
  - Lower: Not determined.
  - Upper: Not determined.
- Oxidising properties: Not determined.
- Vapour pressure: Not determined.
- Density: Not determined.
- Relative density: Not determined.
- Vapour density: Not applicable.
- Evaporation rate: Not applicable.
Safety Data Sheet  
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and OSHA 
GHS

Printing date 30.12.2015  
Revision: 30.12.2015

Trade name: Ceria Zirconia

(Cont'd. from page 5)

- Solubility in / Miscibility with water: Insoluble.
- Partition coefficient (n-octanol/water): Not determined.
- Viscosity: 
  - Dynamic: Not applicable.
  - Kinematic: Not applicable.
- 9.2 Other information No further relevant information available.

SECTION 10: Stability and reactivity

- 10.1 Reactivity No further relevant information available.
- 10.2 Chemical stability Stable under normal temperatures and pressures.
- Thermal decomposition / conditions to be avoided: 
  - No decomposition if used and stored according to specifications.
- 10.3 Possibility of hazardous reactions No dangerous reactions known.
- 10.4 Conditions to avoid Prevent formation of dust.
- 10.5 Incompatible materials: No further relevant information available.
- 10.6 Hazardous decomposition products: No dangerous decomposition products known.

SECTION 11: Toxicological information

- 11.1 Information on toxicological effects
  - Acute toxicity Based on available data, the classification criteria are not met.
  - LD/LC50 values relevant for classification: None.
  - Primary irritant effect: 
    - Skin corrosion/irritation Slight irritant effect on skin and mucous membranes.
    - Serious eye damage/irritation Slight irritant effect on eyes.
    - Respiratory or skin sensitisation Based on available data, the classification criteria are not met.
  - Carcinogenic categories

  IARC (International Agency for Research on Cancer): None of the ingredients are listed.

  NTP (National Toxicology Program): None of the ingredients are listed.

  OSHA-Ca (Occupational Safety & Health Administration): None of the ingredients are listed.

- Probable Routes of Exposure
  - Ingestion.
  - Inhalation.
  - Eye contact.
  - Skin contact.
- Acute effects (acute toxicity, irritation and corrosivity): None.

(Cont'd. on page 7)
Trade name: Ceria Zirconia

- **Repeated dose toxicity:**
  Repeated or long-term inhalation of product dusts may cause pulmonary disease.
- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction):**
  - **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
  - **Carcinogenicity** Based on available data, the classification criteria are not met.
  - **Reproductive toxicity** Based on available data, the classification criteria are not met.
  - **STOT-single exposure** Based on available data, the classification criteria are not met.
  - **STOT-repeated exposure** Based on available data, the classification criteria are not met.
- **Aspiration hazard** Based on available data, the classification criteria are not met.

### SECTION 12: Ecological information

- **12.1 Toxicity**
  - **Aquatic toxicity:** No further relevant information available.
- **12.2 Persistence and degradability** No further relevant information available.
- **12.3 Bioaccumulative potential** No further relevant information available.
- **12.4 Mobility in soil** No further relevant information available.
- **Additional ecological information:**
  - **General notes:** Generally not hazardous for water
- **12.5 Results of PBT and vPvB assessment**
  - **PBT:** Not applicable.
  - **vPvB:** Not applicable.
- **12.6 Other adverse effects** No further relevant information available.

### SECTION 13: Disposal considerations

- **13.1 Waste treatment methods**
  - **Recommendation**
    Smaller quantities can be disposed of with household waste.
    Contact waste processors for recycling information.
    The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes.
- **Uncleaned packaging:**
  - **Recommendation:** Disposal must be made according to official regulations.

### SECTION 14: Transport information

- **14.1 UN-Number**
  - **DOT, ADR, IMDG, IATA** Not Regulated
- **14.2 UN proper shipping name**
  - **DOT, ADR, IMDG, IATA** Not Regulated
**Safety Data Sheet**  
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and OSHA GHS

**Trade name:** Ceria Zirconia

(Cont'd. from page 7)

<table>
<thead>
<tr>
<th>14.3 Transport hazard class(es)</th>
<th></th>
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<tbody>
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</table>

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<tr>
<th>14.4 Packing group</th>
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<tbody>
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<table>
<thead>
<tr>
<th>14.5 Environmental hazards:</th>
<th></th>
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<tbody>
<tr>
<td>Marine pollutant:</td>
<td>No</td>
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<tr>
<th>14.6 Special precautions for user</th>
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<tbody>
<tr>
<td></td>
<td>Not applicable.</td>
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<tr>
<th>14.7 Transport in bulk according to Annex II of Marpol and the IBC Code</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Not applicable.</td>
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</tbody>
</table>

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**SECTION 15: Regulatory information**

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
  - United States (USA)
  - SARA

  - **Section 355 (extremely hazardous substances):**
    None of the ingredients are listed.

  - **Section 313 (Specific toxic chemical listings):**
    None of the ingredients are listed.

- **TSCA (Toxic Substances Control Act):**
  All ingredients are listed.

  - **Proposition 65 (California):**
    - **Chemicals known to cause cancer:**
      None of the ingredients are listed.

    - **Chemicals known to cause reproductive toxicity for females:**
      None of the ingredients are listed.

    - **Chemicals known to cause reproductive toxicity for males:**
      None of the ingredients are listed.

    - **Chemicals known to cause developmental toxicity:**
      None of the ingredients are listed.

- **Carcinogenic Categories**
  - **EPA (Environmental Protection Agency)**
    1306-38-3 | cerium dioxide

  - **IARC (International Agency for Research on Cancer)**
    None of the ingredients are listed.

  - **NIOSH-Ca (National Institute for Occupational Safety and Health)**
    None of the ingredients are listed.

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Trade name: Ceria Zirconia

- Canada
  - Canadian Domestic Substances List (DSL)
    All ingredients are listed.
  - Canadian Ingredient Disclosure list (limit 0.1%)
    None of the ingredients are listed.
  - Canadian Ingredient Disclosure list (limit 1%)
    None of the ingredients are listed.
- Other regulations, limitations and prohibitive regulations
  - Substances of very high concern (SVHC) according to REACH, Article 57
    None of the ingredients are listed.

**SECTION 16: Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Abbreviations and acronyms:**
  ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  IMDG: International Maritime Code for Dangerous Goods
  DOT: US Department of Transportation
  IATA: International Air Transport Association
  GHS: Globally Harmonised System of Classification and Labelling of Chemicals
  EINECS: European Inventory of Existing Commercial Chemical Substances
  ELINCS: European List of Notified Chemical Substances
  CAS: Chemical Abstracts Service (division of the American Chemical Society)
  DNEL: Derived No-Effect Level (REACH)
  PNEC: Predicted No-Effect Concentration (REACH)
  LC50: Lethal concentration, 50 percent
  LD50: Lethal dose, 50 percent
  PBT: Persistent, Bioaccumulative and Toxic
  SVHC: Substances of Very High Concern
  vPvB: very Persistent and very Bioaccumulative
  NIOSH: National Institute for Occupational Safety
  OSHA: Occupational Safety & Health

- **Sources**
  Website, Chemical Abstracts Registry, American Chemical Society (https://www.cas.org)
  Safety Data Sheets, Individual Manufacturers
  SDS Prepared by:
  ChemTel Inc.
  1305 North Florida Avenue
  Tampa, Florida USA 33602-2902

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Trade name: Ceria Zirconia

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