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

1.1 Product identifier
- Trade name: Alumina Titania
- Product code: #106, #107, #109, #110, #112, #117, #119, #1010, 1342, 7005, 7006, 7012, 9319, 9320, 9321, 9323, 9324, 9375, 9386, 9387, 9388, 9389

1.2 Relevant identified uses of the substance or mixture and uses advised against
- Application of the substance / the mixture: Thermal Spray Powder
- 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:
- ChemTel
  (800)255-3924 (North America)
  +1 (813)248-0585 (International)
  1-300-954-583 (Australia)
  0-800-591-6042 (Brazil)
  400-120-0751 (China)
  000-800-100-4086 (India)
  800-099-0731 (Mexico)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
- Classification according to Regulation (EC) No 1272/2008
  Classifications listed are applicable to the OSHA GHS Hazard Communication Standard (29CFR1910.1200).
  Carb. 2  H351  Suspected of causing cancer. Route of exposure: Inhalation.

2.2 Label elements
- Labelling according to Regulation (EC) No 1272/2008
  The product is classified and labelled according to the Globally Harmonized System within the United States (GHS).
  The product is classified and labelled according to the CLP regulation.
- Hazard pictograms

GHS08
Trade name: Alumina Titania

Signal word
Warning

Hazard-determining components of labelling:
Titanium dioxide

Hazard statements
H351 Suspected of causing cancer. Route of exposure: Inhalation.

Precautionary statements
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P280 Wear protective gloves/protective clothing/eye protection.
P308+P313 If exposed or concerned: Get medical advice/attention.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Additional information:
Warning! Hazardous respirable dust may be formed when used. Do not breathe dust.

2.3 Other hazards
There are no other hazards not otherwise classified that have been identified.

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Components:

<table>
<thead>
<tr>
<th>CAS:</th>
<th>EINECS:</th>
<th>Reg.nr.:</th>
<th>Substance</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1344-28-1</td>
<td>215-691-6</td>
<td>01-2119529248-35-0123</td>
<td>Aluminium oxide substance with a Community workplace exposure limit</td>
<td>60-97%</td>
</tr>
<tr>
<td>13463-67-7</td>
<td>236-675-5</td>
<td>01-2119489379-17-0245</td>
<td>Titanium dioxide Carc. 2, H351</td>
<td>3-40%</td>
</tr>
</tbody>
</table>

Additional information: For the wording of the listed Hazard Statements refer to section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures
After inhalation: Supply fresh air; consult doctor in case of complaints.
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.
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

(Cont'd. on page 3)
50.1.3 Breathing difficulty
   Coughing
May cause gastro-intestinal irritation if ingested.

Hazard:
Suspected of causing cancer. Route of exposure: Inhalation.
Danger of impaired breathing.
Long term inhalation of product dust may be harmful.

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.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
   Ensure adequate ventilation
   Do not breathe dust.
   Wear appropriate NIOSH or EU approved respirator when ventilation is inadequate and occupational exposure limits are exceeded.

6.2 Environmental precautions No special measures required.

6.3 Methods and material for containment and cleaning up
   Pick up mechanically.
   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.
Trade name: Alumina Titania

7.2 Conditions for safe storage, including any incompatibilities
- 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: Store in dry conditions.

7.3 Specific end use(s) No further relevant information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
- Ingredients with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>EL (Canada)</th>
<th>EV (Canada)</th>
<th>WEL (Great Britain)</th>
<th>OEL (Ireland)</th>
<th>PEL (USA)</th>
<th>REL (USA)</th>
<th>TLV (USA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1344-28-1 Aluminium oxide</td>
<td>Long-term value: 1,0 mg/m³ respirable, as Al</td>
<td>Long-term value: 10 mg/m³ total dust</td>
<td>Long-term value: 10* 4** mg/m³ *inhalable dust **respirable dust</td>
<td>Long-term value: 10* 4** mg/m³ *total inhalable **respirable dust</td>
<td>Long-term value: 15*; 5** mg/m³ *Total dust; ** Respirable fraction</td>
<td>Long-term value: 10* 4** mg/m³ *total dust; **respirable fraction</td>
<td>Long-term value: 10* 4** mg/m³ as Al*Total dust**Respirable/pyro powd./welding f.</td>
</tr>
<tr>
<td>EL (Canada)</td>
<td>Long-term value: 10* 2** mg/m³ *total dust; **respirable fraction; IARC 2B</td>
<td>Long-term value: 10 mg/m³ total dust</td>
<td>Long-term value: 10* 4** mg/m³ *total inhalable **respirable</td>
<td>Long-term value: 10* 4** mg/m³ *total inhalable **respirable dust</td>
<td>Long-term value: 15* mg/m³ *total dust</td>
<td>See Pocket Guide App. A</td>
<td>Long-term value: 10 mg/m³</td>
</tr>
<tr>
<td>13463-67-7 Titanium dioxide</td>
<td>Long-term value: 10* 3** mg/m³ *total dust; **respirable fraction</td>
<td>Long-term value: 10 mg/m³ total dust</td>
<td>Long-term value: 10* 4** mg/m³ *total inhalable **respirable</td>
<td>Long-term value: 10* 4** mg/m³ *total inhalable **respirable dust</td>
<td>Long-term value: 15* mg/m³ *total dust</td>
<td>See Pocket Guide App. A</td>
<td>Long-term value: 10 mg/m³</td>
</tr>
</tbody>
</table>

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

8.2 Exposure controls
- General protective and hygienic measures:
The usual precautionary measures are to be adhered to when handling chemicals. Keep away from foodstuffs, beverages and feed.
### Trade name: Alumina Titania

<table>
<thead>
<tr>
<th>Wash hands before breaks and at the end of work. Avoid breathing dust. Avoid close or long term contact with the skin. Avoid contact with the eyes.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respiratory protection:</strong> For spills, respiratory protection may be advisable. Wear appropriate NIOSH or EU approved respirator when ventilation is inadequate and occupational exposure limits are exceeded. Particulate mask should filter at least 99% of airborne particles.</td>
</tr>
<tr>
<td><strong>Protection of hands:</strong> Wear gloves for the protection against mechanical hazards according to NIOSH or EN 388.</td>
</tr>
<tr>
<td><strong>Eye protection:</strong> Follow relevant national guidelines concerning the use of protective eyewear.</td>
</tr>
<tr>
<td><strong>Body protection:</strong> Protective work clothing</td>
</tr>
<tr>
<td><strong>Limitation and supervision of exposure into the environment:</strong> No further relevant information available.</td>
</tr>
<tr>
<td><strong>Risk management measures:</strong> No further relevant information available.</td>
</tr>
</tbody>
</table>

### SECTION 9: Physical and chemical properties

<table>
<thead>
<tr>
<th><strong>9.1 Information on basic physical and chemical properties</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
</tr>
<tr>
<td>Form: Powder</td>
</tr>
<tr>
<td>Colour: Grey</td>
</tr>
<tr>
<td>Odour: Odourless</td>
</tr>
<tr>
<td>Odour threshold: Not determined.</td>
</tr>
<tr>
<td><strong>pH-value:</strong> Not applicable.</td>
</tr>
<tr>
<td><strong>Melting point/freezing point:</strong> 1860 °C (3380 °F)</td>
</tr>
<tr>
<td><strong>Initial boiling point and boiling range:</strong> Not determined.</td>
</tr>
<tr>
<td><strong>Flash point:</strong> Not applicable.</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas):</strong> Not determined.</td>
</tr>
<tr>
<td><strong>Auto/Self-ignition temperature:</strong> Not determined.</td>
</tr>
<tr>
<td><strong>Decomposition temperature:</strong> Not determined.</td>
</tr>
<tr>
<td><strong>Explosive properties:</strong> Product does not present an explosion hazard.</td>
</tr>
<tr>
<td><strong>Explosion limits</strong></td>
</tr>
<tr>
<td>Lower: Not determined.</td>
</tr>
<tr>
<td>Upper: Not determined.</td>
</tr>
<tr>
<td><strong>Oxidising properties</strong></td>
</tr>
<tr>
<td>Non-oxidising.</td>
</tr>
<tr>
<td><strong>Vapour pressure:</strong> Not determined.</td>
</tr>
<tr>
<td><strong>Density:</strong></td>
</tr>
<tr>
<td>Relative density at 20 °C (68 °F): 3.65</td>
</tr>
<tr>
<td>Vapour density: Not applicable.</td>
</tr>
<tr>
<td>Evaporation rate: Not applicable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Solubility in / Miscibility with</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Cont'd. on page 6)</td>
</tr>
</tbody>
</table>
Trade name: Alumina Titania

(Cont'd. from page 5)

<table>
<thead>
<tr>
<th>water:</th>
<th>Insoluble.</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Partition coefficient: n-octanol/water:</td>
<td>Not determined.</td>
</tr>
<tr>
<td>· Viscosity</td>
<td></td>
</tr>
<tr>
<td>Dynamic:</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Kinematic:</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

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
Reacts with strong acids and alkali. As the product is supplied it is not capable of dust explosion; however enrichment with fine dust causes risk of dust explosion.

10.4 Conditions to avoid
Prevent formation of dust.

10.5 Incompatible materials
Strong acids.

10.6 Hazardous decomposition products
Toxic metal compounds

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:

<table>
<thead>
<tr>
<th>13463-67-7 Titanium dioxide</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD50</td>
<td>&gt;20000 mg/kg (rat)</td>
</tr>
<tr>
<td>Dermal LD50</td>
<td>&gt;10000 mg/kg (rabbit)</td>
</tr>
</tbody>
</table>

Primary irritant effect
Skin corrosion/irritation: Based on available data, the classification criteria are not met.
Serious eye damage/irritation: Based on available data, the classification criteria are not met.
Respiratory or skin sensitisation: Based on available data, the classification criteria are not met.

Carcinogenic categories
IARC (International Agency for Research on Cancer):

| 13463-67-7 Titanium dioxide | 2B |

Probable routes of exposure:
Ingestion.
Inhalation.
Eye contact.
Skin contact.

Acute effects (acute toxicity, irritation and corrosivity): No further relevant information available.
Repeated dose toxicity:

(Cont'd. on page 7)
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.
- 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/RID/ADN, IMDG, IATA: Not Regulated
- 14.2 UN proper shipping name
  - DOT, ADR/RID/ADN, IMDG, IATA: Not Regulated
- 14.3 Transport hazard class(es)
  - DOT, ADR/RID/ADN, IMDG, IATA: Not Regulated
  - Class: -
  - Label: -
Trade name: Alumina Titania

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

SECTION 15: Regulatory information

<table>
<thead>
<tr>
<th><strong>15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture</strong></th>
<th>United States (USA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section 302 (extremely hazardous substances):</strong></td>
<td>None of the ingredients are listed.</td>
</tr>
<tr>
<td><strong>Section 313 (Specific toxic chemical listings):</strong></td>
<td>1344-28-1 Aluminium oxide</td>
</tr>
<tr>
<td><strong>TSCA (Toxic Substances Control Act):</strong></td>
<td>All ingredients are listed or exempt.</td>
</tr>
<tr>
<td><strong>Proposition 65 (California):</strong></td>
<td>Chemicals known to cause cancer:</td>
</tr>
<tr>
<td></td>
<td>13463-67-7 Titanium dioxide</td>
</tr>
<tr>
<td><strong>Chemicals known to cause developmental toxicity for females:</strong></td>
<td>None of the ingredients are listed.</td>
</tr>
<tr>
<td><strong>Chemicals known to cause developmental toxicity for males:</strong></td>
<td>None of the ingredients are listed.</td>
</tr>
<tr>
<td><strong>Chemicals known to cause developmental toxicity:</strong></td>
<td>None of the ingredients are listed.</td>
</tr>
<tr>
<td><strong>EPA (Environmental Protection Agency)</strong></td>
<td>None of the ingredients are listed.</td>
</tr>
<tr>
<td><strong>IARC (International Agency for Research on Cancer)</strong></td>
<td>13463-67-7 Titanium dioxide</td>
</tr>
<tr>
<td><strong>Canadian Domestic Substances List (DSL)</strong></td>
<td>All ingredients are listed or exempt.</td>
</tr>
<tr>
<td><strong>Other regulations, limitations and prohibitive regulations</strong></td>
<td>Substances of very high concern (SVHC) according to REACH, Article 57</td>
</tr>
<tr>
<td></td>
<td>None of the ingredients are listed.</td>
</tr>
</tbody>
</table>
**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.

- **Relevant phrases**
  - H351 Suspected of causing cancer. Route of exposure: Inhalation.

- **Abbreviations and acronyms:**
  - ADR: 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, Bio-accumulable, Toxic
  - SVHC: Substances of Very High Concern
  - vPvB: very Persistent and very Bioaccumulative
  - Carc. 2: Carcinogenicity – Category 2

- **Sources**
  - Website, European Chemicals Agency (echa.europa.eu)
  - Website, US EPA Substance Registry Services (ofmpub.epa.gov/sor internet/registry/substreg/home/overview/home.do)
  - Website, Chemical Abstracts Registry, American Chemical Society (www.cas.org)
  - Safety Data Sheets, Individual Manufacturers

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