

SAFETY DATA SHEET

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006

Issuing Date 15-May-2009 Revision Date 05-May-2010

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND THE COMPANY/UNDERTAKING

Product Name Titanium Dioxide
Synonyms Cristal 100, Cristal 113, Cristal 121, Cristal 122, Cristal 128, Cristal 134
Formula TiO₂

Recommended use White pigment that imparts opacity to surface coatings, plastics and paper.

Company

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2. HAZARDS IDENTIFICATION

These products are not classified as dangerous according to Directives 67/548/EEC and 1999/45/EC.
Not dangerous.

Most Important Hazards

Inhalation Inert nuisance dust. Temporary drying effect and/or irritation of mucous membranes may result from excessive exposure. Exposure to dust may aggravate pre-existing respiratory conditions.

Eyes Inert, foreign body hazard only.

Skin Non-corrosive and non-sensitising. Prolonged contact may result in rashes/irritations due to drying of the skin and/or mechanical abrasion related to skin-to-clothing contact or skin-to-skin contact.

Skin Absorption Not applicable.

Ingestion No adverse health effects anticipated by this route during proper industrial handling.

Properties Affecting Health Titanium dioxide is listed by IARC as possibly carcinogenic to humans (Group 2B). This listing is based on inadequate evidence of carcinogenicity in humans and sufficient evidence in animal studies.

Environmental Properties If released to the environment, will cause white staining of waterways, vegetation and soil.

Personal protective equipment Wear suitable gloves and eye/face protection.

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Chemical Name | CAS-No | EC No | REACH Reg. No | Weight % | Classification |
|--------------------|------------|-------------------|---------------|----------|----------------|
| Titanium dioxide | 13463-67-7 | EEC No. 236-675-5 | Not available | 84-98 | - |
| Amorphous Silica | 7631-86-9 | EEC No. 231-545-4 | Not available | 0-9 | - |
| Aluminum hydroxide | 21645-51-2 | EEC No. 244-492-7 | Not available | 1-5 | - |

See Section 16 for Individual Compositions

Note

These products contain <1% organic additive(s)

4. FIRST AID MEASURES

| | |
|---------------------------|--|
| Eye Contact | Wash off with plenty of water. If symptoms persist, call a physician. |
| Skin Contact | Wash skin with soap and water. Use of moisturizer may be helpful. |
| Ingestion | No adverse health effects anticipated by this route during proper industrial handling. |
| Inhalation | Move to fresh air. |
| Notes to Physician | None. |

5. FIRE-FIGHTING MEASURES

| | |
|--|--|
| Suitable Extinguishing Media | No fire hazard. |
| Extinguishing media which must not be used for safety reasons | None. |
| Special Exposure Hazards Arising from the Substance/Preparation Including Combustion Products and Gases | Precautions against discharge of static electricity should be taken during powder handling operations. |
| Special Protective Equipment for Firefighters | Wear self-contained breathing apparatus and protective suit. |

6. ACCIDENTAL RELEASE MEASURES

| | |
|----------------------------------|---|
| Environmental Precautions | Prevent product from entering drains. |
| Personal Precautions | Avoid inhalation of dust by arranging adequate ventilation, or use an appropriate dust mask. Avoid excessive contact with the skin. |
| Methods for Cleaning up | Use any feasible mechanical means (e.g. vacuuming, absorbent material). |
| Other Information | See Section 12 for additional information. |

7. HANDLING AND STORAGE

| | |
|----------------------|---|
| Handling | Minimize inhalation of dust and contact with the skin. |
| Storage | Keep in a dry place. Can cause slippery condition if wet. |
| Specific Uses | Take precautions against the discharge of static electricity during powder handling operations. |

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits

| Chemical Name | EU | The United Kingdom | France | Spain | Germany |
|----------------------------------|----|---|---------------------------|--|--|
| Titanium dioxide 13463-67-7 | | STEL: 12 mg/m ³ STEL: 30 mg/m ³ TWA: 10 mg/m ³ TWA: 4 mg/m ³ | VME: 10 mg/m ³ | VLA-ED: 10 mg/m ³ VLA-ED | MAK: 1.5 mg/m ³ |
| Amorphous Silica 7631-86-9 | | STEL: 18 mg/m ³ STEL: 7.2 mg/m ³ TWA: 2.4 mg/m ³ TWA: 6 mg/m ³ | | | MAK: 4 mg/m ³ TWA: 4 mg/m ³ |
| Aluminum hydroxide 21645-51-2 | | STEL: 12 mg/m ³ STEL: 30 mg/m ³ TWA: 10 mg/m ³ TWA: 4 mg/m ³ | | | MAK: 1.5 mg/m ³ MAK: 4 mg/m ³ |

| Chemical Name | Italy | Portugal | The Netherlands | Finland | Denmark |
|----------------------------------|-------|---------------------------|-------------------------------|---------|--------------------------|
| Titanium dioxide 13463-67-7 | | TWA: 10 mg/m ³ | MAC: 10 mg/m ³ MAC | | TWA: 6 mg/m ³ |
| Amorphous Silica 7631-86-9 | | | | | |
| Aluminum hydroxide 21645-51-2 | | | | | |

| Chemical Name | Austria | Switzerland | Poland | Norway | Ireland |
|----------------------------------|---|--|--|---|--|
| Titanium dioxide 13463-67-7 | MAK: 6 mg/m ³ MAK (respirable fraction) | MAK: 3 mg/m ³ MAK (respirable) | NDS: 10.0 mg/m ³ | TWA: 5 mg/m ³ STEL: 10 mg/m ³ | TWA: 10 mg/m ³ TWA: 4 mg/m ³ |
| Amorphous Silica 7631-86-9 | MAK: 4 mg/m ³ MAK (inhalable fraction) | MAK: 4 mg/m ³ MAK (inhalable); 0.3 mg/m ³ MAK (respirable) | | TWA: 1.5 mg/m ³ STEL: 3 mg/m ³ | TWA: 2.4 mg/m ³ TWA: 6 mg/m ³ |
| Aluminum hydroxide 21645-51-2 | | MAK: 3 mg/m ³ MAK (respirable) | NDS: 1.2 mg/m ³ NDS: 2.5 mg/m ³ | | |

| Chemical Name | Belgium | Czech Republic | Greece | Sweden | United States |
|----------------------------------|---------------------------|--|--------|--------|--|
| Titanium dioxide 13463-67-7 | TWA: 10 mg/m ³ | | | | TLV-TWA: 10 mg/m ³ TWA: 15 mg/m ³ |
| Amorphous Silica 7631-86-9 | | TWA: 0.1 mg/m ³ TWA: 4.0 mg/m ³ | | | |
| Aluminum hydroxide 21645-51-2 | | TWA: 10.0 mg/m ³ | | | |

Occupational Exposure Controls

Engineering Measures

Good natural ventilation will be sufficient in most circumstances. Local exhaust ventilation may be necessary if airborne dust concentration approaches the exposure limit (s).

Personal Protective Equipment

Respiratory Protection

Use an approved dust respirator if the exposure standard is, or may be, exceeded.

Eye Protection

Safety glasses with side-shields or goggles.

Skin and Body Protection

Wear protective gloves/clothing.

| | |
|--|---|
| Hand Protection | Impervious gloves. |
| Other Protective Equipment | If dust levels are excessive use an approved dust respirator and eye protection. |
| Hygiene Measures | Individuals having sensitive skin may find it beneficial to use a barrier cream or moisturizer when excessive or prolonged contact with the skin is likely. |
| Environmental Exposure Controls | Prevent product from entering drains. |

9. PHYSICAL AND CHEMICAL PROPERTIES

Important Health, Safety and Environmental Information

General Information

| | | | |
|-----------------------------------|----------------------|------------------------------------|--|
| Physical State | Solid | Appearance | White |
| Odor | Odorless | | |
| Flash Point | Not applicable. | Boiling Point/Boiling Range | Not applicable |
| pH | Not applicable | Autoignition Temperature | Not applicable |
| Vapor Pressure | Not applicable | VOC Content(%) | Cristal 100 and 128 <0.1% All others = 0% |
| Viscosity | Not applicable | Water Solubility | Insoluble in water |
| Specific Gravity | 4.1g/cm ³ | Oxidizing Properties | Not applicable |
| Evaporation Rate | Not applicable | Vapor Density | Not applicable |
| Flammability Limits in Air | Not applicable | Explosive Properties | Not applicable |

Other Information

Melting Point/Range 1830°C

10. STABILITY AND REACTIVITY

| | |
|---|---------------------------------|
| Stability | Stable under normal conditions. |
| Conditions to Avoid | None. |
| Materials to Avoid | None. |
| Hazardous Decomposition Products | None. |

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

| Chemical Name | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|--------------------|-------------------------------|-----------------------------------|-----------------|
| Titanium dioxide | 10000 mg/kg Oral LD50 (Rat) | | |
| Amorphous Silica | 5000 mg/kg Oral LD50 (Rat) | 2000 mg/kg Dermal LD50 (Rabbit) | |
| Aluminum hydroxide | 5000 mg/kg Oral LD50 (Rat) | | |

Chronic Toxicity

Corrosivity Individuals with sensitive skin may experience skin irritation on prolonged or repeated exposure.

Sensitization No sensitization responses were observed.

Target Organ Effects In lifetime inhalation studies of rats, airborne respirable-size titanium dioxide particles have been shown to cause lung tumors at concentrations associated with substantial particle lung burdens and consequential pulmonary overload and inflammation. However, other laboratory animals such as mice and hamsters did not develop lung tumors under similar testing with titanium dioxide. Furthermore, human epidemiology studies do not suggest an association between occupational exposure to titanium dioxide and risk for cancer.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Available evidence indicates that Titanium Dioxide does not cause any significant adverse environmental effects.

| Chemical Name | Toxicity to Algae | Toxicity to Fish | Microtox | Daphnia Magna (Water Flea) |
|------------------|----------------------|---|----------|----------------------------|
| Amorphous Silica | EC50 = 440 mg/L 72 h | LC50= 5000 mg/L Brachydanio rerio 96 h | | EC50 = 7600 mg/L 48 h |

Persistence and Degradability Titanium dioxide is persistent and does not biodegrade.

Bioaccumulative Potential Does not bioaccumulate.

Mobility There is no evidence of mobility of these products (solid particles).

13. DISPOSAL CONSIDERATIONS

Waste from Residues / Unused Products These products are not considered hazardous for disposal into sanitary landfill or industrial waste disposal landfill. Please review appropriate national and local waste regulations.

Contaminated Packaging Contaminated packages are not considered hazardous for disposal into sanitary landfill or industrial waste disposal landfill. Please review appropriate national and local waste regulations.

14. TRANSPORT INFORMATION

IMDG/IMO Not regulated

RID Not regulated

ADR Not regulated

ICAO Not regulated

IATA Not regulated

15. REGULATORY INFORMATION

These products are not classified as dangerous according to Directives 67/548/EEC and 1999/45/EC.

Labeling

Symbol(s) Not dangerous.

International Inventories

USA (TSCA) Complies
European Union (EINECS) Complies
Canada (DSL/NDL) Complies
Philippines (PICCS) Complies
Japan (ENCS) Complies
China (IECSC) Complies
Australia (AICS) Complies
Korea (KECL) Complies
New Zealand (NZIoC) Complies

Legend

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

DSL/NDL - 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

NZIoC - New Zealand Inventory of Chemicals

16. OTHER INFORMATION

Composition/Information on Ingredients

| Product Name | Appendix 1 | | | Relative Density |
|--------------|--|--|---|------------------|
| | TiO ₂ (CAS No. 13463-67-7) (Einecs No. 236-675-5) | Aluminum Hydroxide (CAS No. 21645-51-2) (Einecs No. 244-492-7) | Amorphous Silica (CAS No. 7631-86-9) (Einecs No. 231-545-4) | |
| Cristal 100 | 94 - 97 | 2.0 - 4.0 | - | 4.1 |
| Cristal 113 | 84 - 91 | 2.0 - 4.0 | 6.0 - 9.0 | 4.1 |
| Cristal 121 | 92 - 96 | 3.0 - 5.0 | 1.0 - 2.0 | 4.1 |
| Cristal 122 | 92 - 95 | 2.0 - 4.0 | 2.0 - 4.0 | 4.1 |
| Cristal 128 | 94 - 97 | 2.0 - 4.0 | - | 4.1 |
| Cristal 134 | 96 - 98 | 1.0 - 3.0 | - | 4.1 |

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Reason for Revision Rewrite due to entry into new M/SDS authoring system.

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Disclaimer

The information provided on this SDS 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 guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text.

Product Name

Titanium Dioxide

Revision Date

M/SDS Code:

C_MULTI_EU

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