SAFETY DATA SHEET

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

Identification of the substance/preparation	**Tronox® Titanium Dioxide, All Grades**
Use of the substance/preparation	White pigment for applications in coatings, inks, fibers, plastics, paper, glass, vitreous enamels, and ceramics.
Version No.	01
Revision date	22-December-2009
Synonym(s)	TRONOX® Titanium Dioxide 435, CR-470,CR-800, CR-800E, CR-813, CR-822, CR-826, CR-828, CR-834, CR-880, 8300, 8400, 8670, R-KB-2, R-KB-3, R-KB-4, R-KB-5, R-KB-6, R-FD-I, R-PL-1, R-U-2, R-U-5, T-R, TR-HP-2, A-DW-1, A-K-1, 8700, R-FK-2, R-FK-3, 820, 8120.
CAS No.	13463-67-7
Product code	77891, Pigment White #6
SDS Number	B-5017
Manufacturer/Supplier	Tronox Pigments (Holland) BV Prof. Gerbrandyweg 2 3197KK Rotterdam-Botlek The Netherlands ChemProdSteward@tronox.com +31 181 246600 Emergency: CHEMTREC 1-800-424-9300

2. HAZARDS IDENTIFICATION

This preparation is not classified as dangerous according to Directive 1999/45/EC and its amendments.

Physical hazards	Not classified as a physical hazard.
Health hazards	Prolonged exposure may cause chronic effects.
Environmental hazards	Not classified as an environmental hazard.
Specific hazards	Dusts or powder may irritate the respiratory tract, skin and eyes. Frequent inhalation of fume/dust over a long period of time may increase the risk of developing lung diseases although epidemiological studies among titanium dioxide workers could not demonstrate this.
Main symptoms	Upper respiratory tract irritation. Coughing. Irritation of eyes and mucous membranes. Skin irritation.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS No.	Percent	EC-No.	Classification
Titanium dioxide	13463-67-7	86 - 97	236-675-5	
Silicon dioxide	7631-86-9	10 - 20	231-545-4	
Aluminium hydroxide	21645-51-2	0 - 10	244-492-7	
Zirconium oxide	1314-23-4	0 - 2	215-227-2	

Composition comments Components listed make up an inseparable chemically reacted pigment.

4. FIRST-AID MEASURES

Inhalation	Move to fresh air. Get medical attention if any discomfort continues.
Skin contact	Flush skin thoroughly with water. Get medical attention if irritation develops or persists.
Eye contact	Immediately rinse eyes with water. Remove any contact lenses, and continue flushing eyes with running water for at least 15 minutes. Hold eyelids apart to ensure rinsing of the entire surface of the eye and lids with water. Get immediate medical attention.
Ingestion	Rinse mouth thoroughly. Do not induce vomiting without advice from poison control centre. Never give anything by mouth to an unconscious person. If ingestion of a large amount does occur, call a poison control centre immediately.
General advice	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.
Notes to physician	Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media Use fire-extinguishing media appropriate for surrounding materials.

Extinguishing media which must not be used for safety reasons	No restrictions known.
Unusual fire & explosion hazards	This product is not flammable.
Specific hazards	None known.
Fire fighting equipment/instructions	Firefighters should wear full protective clothing including self contained breathing apparatus. Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace.
Specific methods	In the event of fire, cool tanks with water spray. Move container from fire area if it can be done without risk.

6. ACCIDENTAL RELEASE MEASURES

Containment procedures	Collect and dispose of spillage as indicated in Section 13. Prevent entry into waterways, sewer, basements or confined areas.
Personal precautions	Avoid inhalation of dust and contact with skin and eyes. Wear appropriate protective equipment and clothing during clean-up. Local authorities should be advised if significant spillages cannot be contained.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not contaminate water.
Methods for cleaning up	Avoid dust formation. Collect powder using special dust vacuum cleaner with particle filter or carefully sweep into closed container. For waste disposal, see Section 13.

7. HANDLING AND STORAGE

Handling	Avoid inhalation of dust and contact with skin and eyes. Use only with adequate ventilation. Use Personal Protective Equipment recommended in section 8 of the MSDS. Wash thoroughly after handling. Observe good industrial hygiene practices.
Storage	Store in tightly closed original container in a dry and cool place. Store in a closed container away from incompatible materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values

France

Components	Type	Value
Titanium dioxide (13463-67-7)	VME	10 mg/m3

Germany

Components	Type	Value	Form
Aluminium hydroxide (21645-51-2)	AGW	10 mg/m3	Inhalable dust.
		3 mg/m3	Respirable dust.
Silicon dioxide (7631-86-9)	AGW	4 mg/m3	Inhalable fraction.
Titanium dioxide (13463-67-7)	AGW	10 mg/m3	Inhalable dust.
		3 mg/m3	Respirable dust.
Zirconium oxide (1314-23-4)	AGW	1 mg/m3	Inhalable fraction.

Italy

Components	Type	Value	Form
Aluminium hydroxide (21645-51-2)	TWA	1 mg/m3	Respirable fraction.
Titanium dioxide (13463-67-7)	TWA	10 mg/m3	
Zirconium oxide (1314-23-4)	STEL	10 mg/m3	
	TWA	5 mg/m3	

Portugal

Components	Type	Value
Silicon dioxide (7631-86-9)	TWA	10 mg/m3
Titanium dioxide (13463-67-7)	TWA	10 mg/m3
Zirconium oxide (1314-23-4)	STEL	10 mg/m3
	TWA	5 mg/m3

Spain

Components	Type	Value
Silicon dioxide (7631-86-9)	TWA	10 mg/m3
Titanium dioxide (13463-67-7)	TWA	10 mg/m3

Components	Type	Value
Zirconium oxide (1314-23-4)	STEL	10 mg/m3
	TWA	5 mg/m3

United Kingdom

Components	Type	Value	Form
Silicon dioxide (7631-86-9)	TWA	6 mg/m3	Inhalable dust.
		2,4 mg/m3	Respirable dust.
Titanium dioxide (13463-67-7)	TWA	10 mg/m3	Inhalable
		4 mg/m3	Respirable.
Zirconium oxide (1314-23-4)	STEL	10 mg/m3	
	TWA	5 mg/m3	

Exposure controls Ventilate as needed to control airborne dust. Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of dust.

Occupational exposure controls

Respiratory protection In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter (type P2). Seek advice from local supervisor.

Hand protection Risk of contact: Wear suitable gloves. Nitrile gloves are recommended. Suitable gloves can be recommended by the glove supplier.

Eye protection Wear dust-resistant safety goggles where there is danger of eye contact.

Skin and body protection Wear appropriate clothing to prevent repeated or prolonged skin contact.

General Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

Hygiene measures Do not breathe dust. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance White powder.

Physical state Solid

Form Powder.

Colour White.

Odour Odourless.

Odour threshold Not available.

pH 5 - 8.5 (10% slurry)

Boiling point 2500 - 3000 °C (4532 - 5432 °F)

Flash point Not available.

Flammability Not available.

Flammability limits in air, upper, % by volume Not available.

Flammability limits in air, lower, % by volume Not available.

Vapour pressure Not available.

Relative density Not available.

Solubility (water) Insoluble

Partition coefficient (n-octanol/water) Not available.

Viscosity Not available.

Vapour density Not available.

Evaporation rate Not available.

Melting point 1830 - 1850 °C (3326 - 3362 °F)

Freezing point Not available.

Auto-ignition temperature Not available.

Bulk density 600 kg/m³ Approx. (@ 20°C)

10. STABILITY AND REACTIVITY

Conditions to avoid	Avoid dust formation.
Hazardous decomposition products	No hazardous decomposition products are known.
Stability	Material is stable under normal conditions.
Materials to avoid	None known.
Hazardous polymerisation	Hazardous polymerisation does not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological data

Components	Test results
Aluminium hydroxide (21645-51-2)	Acute Oral LD50 Rat: > 5000 mg/kg

Routes of exposure	Inhalation. Eye contact. Skin contact.
Chronic toxicity	Frequent inhalation of dust over a long period of time may increase the risk of developing chronic lung diseases and skin irritation.
Sensitisation	Not a skin sensitiser.
Carcinogenicity	Suspected of causing cancer. IARC has classified TIO2 as 2B Possibly carcinogenic to humans. However, the only evidence of carcinogenicity is in rodents exposed to very high concentrations. Two major epidemiology studies among titanium dioxide workers in the US and in EUROPE could not demonstrate an elevated lung cancer risk. Boffetta et. al. Mortality among workers employed in the titanium dioxide production industry in Europe. Cancer Causes Control. 2004 Sep;15(7):697-706. Fryzek et. al. A cohort mortality study among titanium dioxide manufacturing workers in the United States. J Occup Environ Med. 2003 Apr;45(4):400-9. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. IARC Monographs, Volume 93 (Summary)

IARC Monographs. Overall Evaluation of Carcinogenicity

Silicon dioxide (CAS 7631-86-9)	3 Not classifiable as to carcinogenicity to humans.
Titanium dioxide (CAS 13463-67-7)	2B Possibly carcinogenic to humans.

Mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Teratogenicity	Not available.
Reproductivity	Contains no ingredient listed as toxic to reproduction
Epidemiology	Not available.
Neurotoxicity	Not available.
Local effects	Dusts may irritate the respiratory tract, skin and eyes.
Further information	No other specific acute or chronic health impact noted.

12. ECOLOGICAL INFORMATION

Ecotoxicity	The product is not expected to be hazardous to the environment.
Environmental effects	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Persistence and degradability	The degradability of the product has not been stated.
Bioaccumulation	Bioaccumulation is unlikely to be significant because of the low water solubility of this product.
Mobility	The product is insoluble in water and will sediment in water systems.

13. DISPOSAL CONSIDERATIONS

Disposal instructions	Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal. Dispose of this material and its container to hazardous or special waste collection point. Do not allow this material to drain into sewers/water supplies.
Waste from residues / unused products	Dispose of in accordance with local regulations.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied.
EU wastecodes	06 11 99

14. TRANSPORT INFORMATION

ADR

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. REGULATORY INFORMATION

Regulatory information The product does not need to be labelled in accordance with EC directives or respective national laws. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006.

16. OTHER INFORMATION

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

Recommended use White pigment for applications in coatings, inks, fibers, plastics, paper, glass, vitreous enamels, and ceramics.

Further information Nanoparticle Statement- The average primary particle size of this product is larger than the nanoparticle size range as described by ISO/TC 229 and should not be considered as manufactured nanoparticles or nanomaterials. As with other particulate materials there will be a distribution of particle sizes around the average and a small portion of these may be covered by the nanoparticle definition. In this product, the primary particle size is in the 200-300 nm range. However, the primary particle size does not represent the size of particles in this product as supplied since these tend to aggregate or agglomerate into larger particles.

Bibliography HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity

Disclaimer The information in the sheet was written based on the best knowledge and experience currently available.

Issue date 22-December-2009