

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006 (REACH)

Titanium Dioxide Pigment

Date: 13 .03.2009

Version: 2.0

replaces version: 1.0

Page: 1/7



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

1.1 Identification of the substance or preparation: TITANIUM DIOXIDE PIGMENT grades:

**Crimea TiOx-220, Crimea TiOx-230, Crimea TiOx-270,
Crimea TiOx-271, Crimea TiOx-280**

Molecular formula: O₂Ti

Chemical name:

EINECS name: Titanium dioxide

IUPAC name: Titanium (IV) oxide

PRE-REFERENCE NUMBER – 05-2114092032-60-0000

1.2 Use of the substance/preparation:

Pigment.

Used in the following industries: coating industry, printing industry, rubber-processing industry, leather industry, textile industry, paper industry, chemical industry (plastics industry, including production of PE packaging materials and film packaging materials). Used for production of industrial-use ceramics and ceramics for household purpose, for fillers of architectural and constructional materials of interior use, in architectural coatings and primers. Used in production of: road marking thermoplastics; cement slurry for pointing; priming varnish in automotive industry; interior and exterior coatings and paints; decorative paper; coatings and paints for waterborne acrylic sealants; industrial paints; waterborne decorative paints; waterborne emulsion paints used for walls and ceilings; used in production of waterborne bituminous paints for wood finishing; PE color concentrate; used in production of alkyd emulsion paints and coatings, waterborne matte latex paints and waterborne semigloss latex paints; in plastics industry.

1.3 Company/undertaking identification:

Manufacturer: CJSC Crimea TITAN

Severnaya Promzona, Armyansk, Autonomous Republic of Crimea, Ukraine, 96012

Person responsible for commercial introduction of the substance within European Community:

Irene Nasdala

«OSTCHEM Germany GmbH»

Hamburg, Erdmannstr. 10, Germany, 22765

Tel. +49 40 5 300 300 (during working hours only)

Fax: + 49 40 5 300 30 33

E-mail: nasdala@afkem.com

Person responsible for SDS:

Valentina Mikhailovna Grendach – Head of HSE Department.

Address: Severnaya Promzona, Armyansk, Autonomous Republic of Crimea, Ukraine, 96012

Telephone: +38 06567 3 72 11 (during working hours only)

E-mail: dir_ot@titanexport.com

1.4 Emergency telephone: +38 06567 3 74 44 (during working hours only)

+38 06567 3 75 35 (24 hours a day)

SAFETY DATA SHEET



according to Regulation (EC) No. 1907/2006 (REACH)

Titanium Dioxide Pigment

Date: 13.03.2009

Version: 2.0

replaces version: 1.0

Page: 2/7

2 HAZARDS IDENTIFICATION

The product is **not qualified** as hazardous according to Directives 67/548/EEC and 1999/45/EC. Not included in Annex 1 of Regulation No. (EC) 304/2003.

Potential Health Effects:

Inhalation: inhalation of dust may cause discomfort. Inhalation exposure to large amounts may cause a temporary drying effect or irritation of mucous membranes. Exposure to dust may lead to aggravation of pre-existing upper respiratory and lung diseases.

Eye contact: inert foreign body hazard only.

Skin contact: non-aggressive and non-sensitizing. Prolonged contact may result in scaling/irritations due to drying of the skin and/or mechanical abrasion related to skin-to-clothing contact or skin-to-skin contact.

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

3 COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Composition

Chemical name	Mass fraction, %	EINECS No.	CAS No.
Titanium dioxide:	91-98	236-675-5	13463-67-7
Aluminium hydroxide	1-10	244-492-7	21645-51-2
Silicon dioxide amorphous	1-5	231-545-4	7631-86-9

3.2 Classification

Not classified as hazardous

4 FIRST AID MEASURES

Inhalation: remove from exposure area to fresh air; irrigate the nose and throat with water.

Eye contact: rinse with plenty of water while the eyelid is open. If irritation persists, seek medical attention.

Skin contact: Remove contaminated clothing, shoes and outfit immediately. Wash with flowing water until complete removal of the substance. Use of moisturizer may be helpful.

Ingestion: remove the remains of the substance from mouth, rinse with water thoroughly. Make victims drink plenty of water, give activated charcoal, saline purge. Consult a physician.

5 FIRE FIGHTING MEASURES

Titanium dioxide will not burn and sustain combustion. Using extinguishing media depends on fire hazard/explosion characteristics of combustibles in area.

6 ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions

Avoid dust formation. Provide adequate ventilation. Use appropriate personal protective equipment.

6.2. Environmental precautions

Avoid dust dispersion to the environment. Prevent leakages from entering drains and ditches that lead to natural waterways.

6.3. Methods for cleaning up

Use any suitable mechanical means (e.g. vacuum, sweeping), but avoid dusting during clean-up.

SAFETY DATA SHEET



according to Regulation (EC) No. 1907/2006 (REACH)

Titanium Dioxide Pigment

Date: 13.03.2009

Version: 2.0

replaces version: 1.0

Page: 3/7

7 HANDLING AND STORAGE

7.1 Handling

Dust formation possible. Use local and general dust exhaust system equipped with filters. Use personal protective equipment. Hermetically sealed equipment is a measure to prevent aerosol formation. While spillage use dry methods to collect the product into a covered labeled container avoiding respirable dust formation. Clean the spillage area with water and detergent.

7.2 Storage

The product should be stored in original packages in closed clean and dry storage rooms to prevent it from contamination as well as from exposure to atmospheric precipitations (snow, rain) and underground water.

7.3. Specific use – not applicable.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure limits

Working zone air:

Component name	CAS - number	Exposure form	Controlled value	Acceptable concentration	Testing method
Titanium dioxide	13463-67-7	aerosol with fibrogenic effect	TLV	10 mg/m ³	photometric
Aluminium hydroxide	21645-51-2	aerosol with fibrogenic effect	TLV	6,0 mg/m ³	photometric
Silicon dioxide amorphous	7631-86-9	aerosol with fibrogenic effect	TLV	1,0 -4,0 mg/m ³	photometric

8.2 Exposure controls

8.2.1 Occupational exposure controls:

Production facilities should be provided with running drinking water, local and general aspiration system. In facilities, where titanium dioxide is handled, eating and food storage are not permitted.

8.2.1.1. Respiratory protection

Use half mask respirators conforming to EN149 with dust filters according to EN 143 (P2 or P3).

8.2.1.2. Hand protection

Use Neopren or PVC gloves according to EN374 (protection class 3 and higher). Penetration time is more than hour.

8.2.1.3. Eye protection

Use safety dust proof eyewear: safety goggles (frame 5 according to EN166).

8.2.1.4. Skin protection

Use protective clothing.

8.2.2 Environmental exposure controls

In air and wastewater the product doesn't form any toxic compounds in the presence of other substances or factors.

Tentative safe exposure level in atmospheric air (TSEL_{atmospheric air}): **0,5 mg/m³**

Prevent dust emissions into the atmosphere.

Use of bag dust collectors for the local ventilation air is recommended.

Non transformable in the environment.

In case of considerable emission into environment may cause formation of white spots in water bodies, on plants and soil.

Standard for water bodies of domestic and cultural and general water consumption: for inorganic titanium compounds taking into account total content of all forms: TLV_{in water} = 0,1 mg/l

Standard for fisheries waters: TLV_{fw} = 1 mg/l (for TiO₂) and 0,06 mg/l (for titanium)

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006 (REACH)

Titanium Dioxide Pigment

Date: 13.03.2009

Version: 2.0

replaces version: 1.0

Page: 4/7



8.2.3 Measures regarding consumptive use of the substance

No additional measures required while observing 8.2.1.

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 General information

Appearance	powder
Physical state	solid
Colour	white
Odor	odorless

9.2 Important health, safety and environmental information

pH	6,5-8,0 (1 : 10 water suspension)
Boiling point/range	not reachable. 2500 - 3000°C (acc. to another sources of data)
Ignition temperature	noncombustible
Flammability (solid/gaseous state)	nonflammable
Explosive properties	nonexplosive
Oxidizing properties	non-oxidizable
Vapor pressure	no vapor formation under normal conditions
Relative Density	3,8 – 4,2 g/cm ³
Solubility	insoluble in organic solvents. Insoluble in weak mineral acids (except HF) and weak alkali solutions. Slowly soluble in strong sulfuric acid (H ₂ SO ₄), strong alkali solutions, saturated solution of potassium bicarbonate (KHCO ₃)
Water solubility	insoluble
Partition coefficient n-octanol/water	insoluble in water and in n-octanol
Viscosity	n/a
Vapor density	n/a
Evaporation coefficient	n/a

9.3 Other information

Miscibility	immiscible
Fat solubility	insoluble
Melting point	Rutile: 1640 °C

10 STABILITY AND REACTIVITY

Stable under recommended storage and handling conditions. In case of emissions into atmosphere the substance doesn't form toxic compounds.

10.1 Conditions to avoid

The substance is amphoteric (exhibits characteristics of very weak acid and weak base). Reducible, reacts with halogens, interreacts with ammonia and hydrogen peroxide. Reacting with H₂O₂ generates ortho-titanic acid H₄TiO₄

SAFETY DATA SHEET



according to Regulation (EC) No. 1907/2006 (REACH)

Titanium Dioxide Pigment

Date: 13.03.2009

Version: 2.0

replaces version: 1.0

Page: 5/7

(of yellow color). When heated with NH_3 generates TiN . When melted or agglomerated with oxides, metal carbonates titanates and double oxides are generated. With hydrogen, carbon, active metals (magnesium, calcium, sodium) TiO_2 when heated is reduced to lower oxides. When heated with chlorine in the presence of reducing agents (coal) generates TiCl_4 . Not polymerised.

10.2 Incompatibility (Materials to avoid)

N/a

10.3 Hazardous decomposition products

Not known.

11 TOXICOLOGICAL INFORMATION

Acute toxicity:

Acute oral toxicity:

Titanium dioxide	ALD/rat > 25 000 mg/kg
Aluminium hydroxide	LD50/rat > 5 000 mg/kg
Silicon dioxide amorphous	LD50/rat > 10 000 mg/kg

Acute inhalation toxicity:

Titanium dioxide	ALC/4 hours/ rat > 2,29 mg/l
------------------	------------------------------

Acute dermal toxicity

Titanium dioxide	ALD/ rabbit >10 000 mg/kg
------------------	---------------------------

Cumulation: weak.

Clinical presentation of acute toxic exposure: accidents of acute toxic exposure are not described.

Target organs and systems: breathing system.

Lowest toxicity concentrations: $\text{TCLo}=250 \text{ mg/m}^3$ (rat, inhalation 6 hours a day during 2 years; for carcinogenesis).

Irritant action:

Skin: persons with sensitive skin may suffer irritation during permanent or repeated exposure.

Eyes: no

Sensibilizing action: undetermined

Embryotoxic action: undetermined

Gonadotoxic action: undetermined

Teratogenic action: undetermined

Carcinogenic action: there is no evidence that it causes cancer in humans.

Mutagenic activity: not mutagenic

12 ECOLOGICAL INFORMATION

12.1 Ecotoxicity

Acute toxicity for fish: $\text{LC}_0 \geq 1000 \text{ mg/l}$ (*Leuciscus idus*, 48 hours).

$\text{LC}_0 \geq 1000 \text{ mg/l}$ (*Phoxinus phoxinus*, 30 days).

Acute toxicity for *Daphnia magna*: $\text{EC} = 2,0$ (*Scenedesmus obliquus*, 96 hours).

Toxic effect on soil invertebrates: bacterial toxicity: $\text{EC}_0 > 5000 \text{ mg/l}$ (*Pseudomonas fluorescens*, *Escherichia coli*; 24 hours).

12.2 Mobility

In air and wastewater in the presence of other substances or factors TiO_2 doesn't generate toxic compounds.

It doesn't transform in the environment.

12.3 Persistence and biodegradability

Biodegradability [BD = $(\text{BOD}_5 : \text{COD}) \cdot 100 \%$]: < 10 % (practically nonbiodegradable)

Chemical oxygen demand (COD): nonoxidizable

SAFETY DATA SHEET



according to Regulation (EC) No. 1907/2006 (REACH)

Titanium Dioxide Pigment

Date: 13.03.2009

Version: 2.0

replaces version: 1.0

Page: 6/7

Biological oxygen demand (BOD): nonoxidizable

The substance half life is > 30 days.

Persistence and biodegradability – is resistant to degradation and isn't subject to biodegradation.

12.4 Bioaccumulation potential

Cumulativeness: weak

12.5. PBTs classification (persistent-bioaccumulative and toxic substances)

The substance is not persistent bioaccumulative one.

12.6 Other negative effects.

Substances which may cause destruction of the ozone layer: not present

Volatility: non-volatile

13 WASTE DISPOSAL

The product is not hazardous for waste dumping in industrial or sanitary retention ponds. Disposal of the waste in correspondence with the state and local regulations. There are no hazardous wastes according to the Directive 2000/532/EC.

14 TRANSPORT INFORMATION

Titanium dioxide is transported by railway (RID), by road (ADR), by sea (IMDG).

Obligatory mark «**Keep dry**».

Not classified as dangerous goods according to the Regulations concerning the International Carriage of Dangerous Goods.

15 REGULATORY INFORMATION

State standard GOST 12.1.007-76 SSBT. Hazardous substance. Classification and general safety requirements.

State standard GOST 12.1.005-88 SSBT. General hygiene requirements for the air of the working area.

MU No. 1627-77 Instructional Guidelines on spectrophotometrical determination of titanium dioxide and its compounds authorized by the Ministry of Health of USSR.

MU No. 5887-91 Instructional Guidelines on photometric determination of silicon dioxide amorphous, authorized by the Ministry of Health of USSR.

MU No. 3943-85 Instructional Guidelines on photometric determination of aluminum oxide, authorized by the Ministry of Health of USSR.

MU No. 4809-88 Instructional Guidelines on determination of aluminum oxide using a method of atomic absorption spectrometry, authorized by the Ministry of Health of USSR

Specifications TU U 24.1 – 05762329-001 — 2003 Titanium dioxide pigment

Safety Data Card of Hazardous Factor dd. 26.06.2007 No. 7280 B000055

MSDS for titanium dioxide 32785994.21.00131

Hygiene and toxicology datasheet for titanium dioxide developed by the Institute of Ecohygiene and Toxicology named for L. I. Medved, Ministry of Health of Ukraine. 2008

Standard EN 374

Standard EN 149: 2001

Standard EN 166 1F (2002)

16 OTHER INFORMATION

16.1.

R-phrases are absent.

S-phrases are absent.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006 (REACH)

Titanium Dioxide Pigment



Date: 13.03.2009

Version: 2.0

replaces version: 1.0

Page: 7/7

Data concerning carcinogenicity: After re-evaluation in 2006 titanium dioxide was included to the List of IARC and classified as possibly carcinogenic to humans (Group 2B). Titanium dioxide was included to the List of IARC based on IARC's conclusion that "there is inadequate evidence in humans for the carcinogenicity of titanium dioxide" and "there is sufficient evidence in experimental animals for the carcinogenicity of titanium dioxide."

16.2. Training advice

Please read this SDS carefully before use of the product.

16.3. Recommended use restrictions

Provided that all necessary regulatory requirements for production, use, storage, transportation and handling are adhered, titanium dioxide will not have negative effects on environment and human health.

Information contained in this Safety Data Sheet refers to this particular substance. It may be invalid in case this substance is used together with any other materials or in any other production process. The user bears responsibility for assessment of applicability and completeness of this information for his particular applications.