SAFETY DATA SHEET

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1. PRODUCT IDENTIFICATION

PRODUCT NAME: Pretiox Titanium Dioxide
GENERAL USE: Color
PRODUCT CATEGORY: Color

2. COMPOSITION / INFORMATION ON INGREDIENTS

Component	Weight %	CAS #	EINECS no.
Ttianium Dioxide	≥99%	13463-67-7	236-675-5

3. PRODUCT HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

White powder. Does not pose a fire hazard. Overexposure by inhalation may induce upper respiratory irritation.

Potential health effects

Likely routes of exposure: eye contact. skin contact, inhalation of airborne dust

Skin contact: non irritant but as with all fine powders can absorb moisture and natural oils from the surface of the skin during prolonged exposure.

Eye contact: Overexposure may cause a slight physical irritation.

Inhalation: Inert nuisance dust. Overexposure by Inhalation of titanium dioxide may induce mild and temporary upper respiratory irritation with cough and shortness of breath.

Chronic effects/Carcinogenicity : The epidemiology studies did not show an increase in lung cancer in the Ti02 workforce as a result of exposure to Ti02 dust. See Section 11 for more information.

IARC Recently evaluated (Vol.93); Group 2b (possibly carcinogenic to humans). Not listed as a carcinogen by NTP, OSHA, ACGIH. See section 11 for more information.

This product is considered hazardous by OSHA Hazard Communication Standard. (29 CFR 1910.1200)

Potential environmental effects

No significant adverse environmental effects are anticipated

4. FIRST AID MEASURES

Inhalation

Move to a fresh air atmosphere. Give symptomatic treatment as necessary.

Skin contact

Wash with soap and water.

Eye contact

Wash with water or neutral eyewash solution.

Ingestion

Do not induce vomiting. Give up to 200 ml water. In case of persistent symptoms, consult a doctor.

5. FIRE FIGHTING MEASURES

Flammable Properties

Product is inert, non flammable and non combustible.

Extinguishing Media

Use any media appropriate for combustible material in the area.

Protection of fire-fighters

As in any fire. wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure demand or positive-pressure mode and full fire fighting tum out gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Avoid raising and breathing dust. Ensure adequate ventilation. Wear personal protective equipment as described In section 8.

Environmental precautions

Product is inert. No specific risk for the environment. Prevent run-off from entering storm sewers and ditches which lead to natural waterways.

Cleaning Methods

Use any feasible mechanical means (e.g. vacuum, sweeping) but avoid dusting during clean-up. The product can cause slippery conditions if wet.

7. HANDLING AND STORAGE

Handling

Avoid raising and breathing dust.

Handling systems and areas should be operated in such a way as to minimize exposure to dust. **Storage**

Pigments should not be stored in outside areas exposed to the weather. When using Pretiox standard pallets, those containing paper or plastics bags can be stacked to a maximum of three high. In all cases, the protective cover or wrapping should remain in place during storage and only be removed immediately prior to be use. Care should be taken to avoid exposure to moisture, particularly with a partly used pallet of material.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure guidelines

Titanium Dioxide	PEL(OSHA)	:15mg/m3, Total dust, 8h TWA
	TLV (ACGIH)	:10mg/m3, Total dust, 8h TWA
	LMPE (Mexico)	:10mg/m3, Total dust, 8h LMPE-PPT
	(Mexico)	:20mg/m3, Total dust, 15 minute, LMPE- CT

- OSHA: table Z-1 to Z-3 Limits for Air Contaminants (June 30 1993)(29 CFR 1910.1000)(1971 PEL's)
- ACGIH: Threshold limit Values (2006)
- NIOSH: Pocket Guide to Chemical Hazards, June 1997
- Mexico OELs: NOM-010-STPS-1999, Diario Oficial de la Federaticion, 13 Marzo 2000
    - LMPE: Limits Maximos Permisible de Exposicion
    - LMPE-PPT: Limite Miximo Permisible de Exposicion Promedio Ponderado en el Tiempo
    - LMPE-CT: Limite Maximo Permisible de Exposicion del Corto Tiempo.

Engineering controls

Good natural ventilation will be sufficient in most cases. Local exhaust ventilation may be necessary if airborne dust concentration approaches the exposure guideline limits. Provide local exhaust ventilation system to meet exposure limits.

Personal protective equipment

Respiratory protection

The use of an approved dust respirator (NIOSH/MSHA approved air-purifying respirator equipped with HEPA cartridges) is recommended. A respirator must be used if the dust concentration is likely to exceed the occupational exposure limit.

Skin protection

Ti02 pigments are not irritant but as with all fine powders can absorb moisture and natural oils from the **Eye**

protection ■

surface of the skin during prolonged exposure. Prolonged exposure should be avoided by wearing protection clothes and protective gloves, in respect of main rules concerning the chemicals**.**

Wear safety glasses with side shields. The use of approved dustproof goggles is recommended if dust concentrations are likely to exceed the occupational exposure limit.

General hygiene consideration

No special requirements. Avoid breathing dust. Practice common good industrial hygiene. Barrier cream

9. PHYSICAL AND CHEMICAL PROPERTIES

or moisturizers may be beneficial for sensitive skin when excessive or prolonged contact with skin is likely.

Appearance: Solid white powder.
Odor : None.
Odor threshold : Not applicable. pH:
5.0 - 10.0 (aqueous dispersion).
Physical state: fine divided powder
Boiling point: Not Applicable.
Melting point: about 1800° C. (3272°F).
Flash point: Not applicable.
Evaporation rate: Not applicable.
Flammability: Not applicable.
Non flammable solid.
Auto-flammability: Not applicable. Non flammable solid.

Explosive limits: Not applicable. Non flammable solid. Vapor pressure: Not applicable. Non flammable solid.
Vapor density: Not applicable.
Relative density: Not applicable.
Specific gravity: 3.5-4.2 g/cm3 at 20 degrees C.
Solubility: Insoluble in water and organic solvents.
Partition coefficient: n-octanol/water : No data available.
Minimum ignition temperature: > 1000 Degrees C (1832 Degrees F).
Decomposition temperature: Not available.
Particle size: 0.2 - 0.5 microns.
Volatile organic compounds (VQC) content: None. Percent volatile: < 2%.

10. STABILITY AND REACTIVITY

Stability

Stable when used under normal conditions (70°F (21°C) and 14.7 psig *(760* mm Hg}).

Conditions to avoid

None known.

Incompatibilities

None reasonably foreseeable.

Hazardous decomposition products

None.

Possibility of hazardous reactions

will not occur.

11. TOXICOLOGY OF COMPONENTS

Acute effects

Oral LD_{50} (Rat): > 10 000 mg/kg.
Dermal LD_{50} (Rabbit): > 10 000 mg/kg.
Inhalation LD_{50} /4 Hour (Rat): > 6.8 mg/l.
Not a skin sensitizers.

Chronic Effects

Carcinogenicity: In a toxicology study carried out by DuPont in 1985 it was discovered that titanium dioxide caused an unusual type of lung tumour in the rat at very high doses. A more recent titanium dioxide Inhalation toxicology study in three rodent species showed that (a) The rat exhibits a different response to high titanium dioxide concentrations than mice and hamsters (b) There was no evidence that titanium dioxide itself has toxic properties that would lead to cancer. It is the rat's response to overload concentrations of low toxicity dusts that causes the problem. (c) The response to high dust concentrations developed uniquely by the rat significantly adds to the evidence that the lung tumour related effects in particle exposed rats have little relevance to humans.

Recent epidemiology studies across plants in Europe, and separately in North America both come to the same main conclusion that lung cancer death rates did not increase with cumulative exposure to Titanium dioxide dusts or with duration of employment in titanium dioxide manufacturing plants.

In February 2006 IARC concluded, "There is inadequate evidence in humans for the carcinogenicity of titanium dioxide." Based on rat inhalation studies IARC concluded that there is, "sufficient evidence in experimental animals for the carcinogenicity of titanium dioxide: IARC's overall evaluation was that, "Titanium dioxide is possibly carcinogenic to humans (Group 2b)". This conclusion was based on IARC's guidelines which require such a classification if two or more independent studies in one species

carried out at different times or in different laboratories or under different protocols show evidence of tumors.

Mutagenicity : Negative in Ames test with and without metabolic activation
Reproductive Effects : No data **Developmental effects**: No data

12. ECOLOGICAL INFORMATION _This is published literature information related to TiO2

Aquatic Toxicity (acute)

Fish LC_o (Leuciscus idus. 48 hr) : > 1000 mg/L

Mobility

Product is not volatile but may be scattered by generation of dust during handling. Even at low concentration the product renders the discharge in liquid effluent highly visible.

Persistence/degradability

Insoluble in aquatic systems. Non-biodegradable.

Bioaccumutation

No published data. No bioaccumulation expected.

13. DISPOSAL CONSIDERATIONS

Waste disposal

Dispose of in compliance with federal, state and local regulations.

If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under Resource Conversation and Recovery Act (RCRA 40 CFR 261)

Contaminated packaging

If recycling is not practicable, dispose of in compliance with federal, state and local regulations.

The information presented above may not apply if the material has been used or otherwise contaminated. 1\ is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulation.

14. REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Status: All ingredient are on the inventory or exempt from listing.

Toxic Substances Control Act: No specific regulation apply.

SARA Title III Rules

Section 311/312 Hazard Classes

Acute	: No
Chronic	: No
Fire	: No
Reactivity	: No
Pressure	: No

Section 313 Toxic Chemicals: Not applicable.

Section 302/304 Extremely Hazardous Substances (EHS)/CERCLA Hazardous

Substances: Not Applicable.

Other Federal Regulations:

NPCA-HMIS® Rating

Health	: 1
Flammability	: 0
Physical hazard	: 0

Ozone Depleting Substances : None
Volatile Organic Compounds : None
Drug Precursor Regulation : None Weapons
Precursor Regulation: None

State Right-to-know : Titanium dioxide is listed in Massachusetts, New-Jersey, Pennsylvania and Rhode Island.

California Prop. 65 :

Titanium dioxide is not known to the State of Califomia to cause cancer. **Note**: Consult State and local regulations which may also apply.

Australia Regulations

A/CS Status
Worksafe Australia: Not classified as hazardous substance
Occupational Exposure Limits: NOHSC – Titanium Dioxide
: Inspirable dust –TWA: 10 mg/m3
NOHSC: 1003 (1995), as amended through 2005

Canadian W.H.M.I.S. Classification: D2A

Mexican HMIS Rating (Clasificaclon de los grados de riesgo)

Health	: 2
Flammability	: 0
Reactivity	: 0

Canada's DSL/NDSL : All ingredients are listed.

Japan Regulations

MITI : Listed - No. (1)-558
Industrial Safety and Health Law: Listed under ISHL Enforcement Order Article 18-2, Table 9, substances for which safety data sheet is required (Japanese Official Gazelle 24.03.2000)
Fire Service Law, Dangerous substances: No **ISHL Designated Chemical Substances**: No **ISHL Dangerous Substances** : No **ISHL Hazardous Substances subject to Labelling requirement**: No
ISHL Prohibited Substances : No
Specified Poisonous Substances : No **PRTR Substances** : No **Occupational Exposure Limits**
JSOH - Titanium dioxide : TWA: 1 mg/m^3, respirable dust
TWA : 4 mg/m^3, total dust
JSOH Recommendations of Occupational Exposure Limits (2004-2005)

Europe Regulations:

EU Directive 95/45/EC: Identification Number - EC No E171
European EINECS Status: Listed
Directive 2000/5321EC : Not classified as a hazardous waste.
EWC Code: 06 11 99.

Water hazard class WGK (Germany) : nwg (*Nicht Wassergefahrdender") - No : 1345

15. ADDITIONAL COMMENTS

This material safety data sheet complements the technical data sheet for the use of our product but does not replace it. Users are asked to pay attention to the potential risks taken when a product is being used for uses other than the ones for which it has been developed.

Not recommended for permanent medical implant.
For USA, not to be used in amounts greater than 1 % *w/w* in *food* products (FDA 21 CFR 73.575).
For Europe, not to be used in amounts greater than 25% *w/w* as UV-filler in cosmetics (Directive *2002/34/EC,* Annex VII, part 1)

Further information may be obtained by consulting the technical data

Date of preparation January 2007.

MANUFACTURER DISCLAIMER:

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