

846.225

MATERIAL SAFETY DATA SHEET

14.17.890, 4519, 4522, 0028

SECTION I: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER/DISTRIBUTOR: RAINBOW SPECIALTY COLORS, INC. 70 FIFTH AVENUE HAWTHORNE, NJ 07506	PREPARED BY: PREPARATION DATE: EMERGENCY PHONE NUMBER:	DAYANA MARIA DILL 8/13/12 1-973-304-0912
PRODUCT NAME: CHEMICAL NAME: CHEMICAL FAMILY: CHEMICAL ABSTRACT REGISTRY NUMBER:	BLOOD RED BLEND #1094 MIXTURE MIXTURE MIXTURE	

SECTION II: INFORMATION ON HAZARDOUS INGREDIENTS

CHEMICAL NAME - HAZARD: THIS PRODUCT DOES NOT CONTAIN ANY HAZARDOUS INGREDIENTS AS DEFINED BY THE OSHA HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200.

CHEMICAL NAME - CARCINOGEN: THIS PRODUCT DOES NOT CONTAIN ANY CARCINOGENS AS DEFINED BY NTP, IARC AND OSHA.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM (HMIS):		
HEALTH:	1	REACTIVITY: 0
FLAMMABILITY:	1	PROTECTIVE EQUIPMENT: F

SECTION III: HAZARDS IDENTIFICATION & EMERGENCY OVERVIEW

POTENTIAL HEALTH EFFECTS - ACUTE & CHRONIC:
MILD IRRITANT TO THE EYES. ALTHOUGH NO EXPOSURE LIMIT HAS BEEN ESTABLISHED FOR THIS PRODUCT, THE OSHA / PEL FOR NUISANCE DUST IS RECOMMENDED. IN ADDITION, THE ACGIH / TLV FOR NUISANCE DUST OF 10 MG/M3 IS RECOMMENDED.

PRIMARY ROUTES OF ENTRY:
INHALATION, INGESTION, EYE AND SKIN CONTACT.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
ALTHOUGH WE HAVE NO DATA AVAILABLE ON THE EFFECTS OF INHALING THIS PRODUCT, INDIVIDUALS WITH IMPAIRED PULMONARY FUNCTION MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF INHALING ANY TYPE OF DUSTY MATERIAL.

SECTION IV: FIRST AID MEASURES

EYE CONTACT:	IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.
SKIN CONTACT:	WASH WITH SOAP AND WATER. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.
INHALATION:	MOVE PATIENT TO FRESH AIR. AID IN BREATHING IF NECESSARY AND GET PROMPT MEDICAL ATTENTION.
INGESTION:	INDUCE VOMITING IN A CONSCIOUS PERSON. NEVER GIVE FLUIDS OR INDUCE VOMITING IF THE PATIENT IS UNCONSCIOUS OR HAVING CONVULSIONS. GET MEDICAL ATTENTION.
EFFECTS OF OVEREXPOSURE:	PROLONGED CONTACT MAY CAUSE IRRITATIONS. CHRONIC AFFECTS ARE UNKNOWN.

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SECTION IX: PHYSICAL & CHEMICAL PROPERTIES

APPEARANCE: RED POWDER.

ODOR: NO APPRECIABLE ODOR.

SOLUBILITY IN WATER: SOLUBLE

CHEMICAL DATA:

BOILING POINT: N/A (F)

VAPOR PRESSURE: N/A (mmHg)

VAPOR DENSITY: N/A (AIR=1)

FREEZING POINT: N/A (F)

SPECIFIC GRAVITY:

% VOLATILE BY VOLUME:

EVAPORATION RATE:

MELTING POINT:

N/A (WATER=1)

N/A

N/A (BUTYL ACETATE=1)

N/E (F)

SECTION X: STABILITY & REACTIVITY

CHEMICAL STABILITY: THIS PRODUCT SHOULD BE STABLE UNDER NORMAL STORAGE CONDITIONS.

CONDITIONS TO AVOID FOR STABILITY: EXTREME HEAT. STRONG OXIDIZING AND REDUCING AGENTS.

INCOMPATIBILITY (MATERIALS TO AVOID): OXIDIZING AND REDUCING AGENTS MAY DESTROY COLOR.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS.

CONDITIONS TO AVOID FOR POLYMERIZATION: NOT APPLICABLE.

SECTION XI: TOXICOLOGICAL INFORMATION

ANIMAL TOXICITY: NO INFORMATION.

AQUATIC TOXICITY: NO INFORMATION.

SECTION XII: ECOLOGICAL INFORMATION

ECOTOXICITY: NO INFORMATION.

ENVIRONMENTAL FATE: NO INFORMATION.

SECTION XIII: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS:

THIS PRODUCT, IN THE SAME CONDITION AS SOLD, ALONG WITH THE CLEAN UP WATER AND ABSORBANT, SHOULD BE DISCARDED IN ACCORDANCE WITH EXISTING FEDERAL, STATE, LOCAL OR PROVINCIAL ENVIRONMENTAL CONTROL REGULATIONS. CONSULT WITH YOUR SUPERVISOR BEFORE DISPOSAL.

RCRA OR CERCLA REGULATED:

IF DISCARDED IN ITS PURCHASED FORM, THIS PRODUCT WOULD NOT BE A HAZARDOUS WASTE EITHER BY LISTING OR BY CHARACTERISTIC. HOWEVER, UNDER RCRA, IT IS THE RESPONSIBILITY OF THE PRODUCT USER TO DETERMINE AT THE TIME OF DISPOSAL, WHETHER A MATERIAL CONTAINING THE PRODUCT OR DERIVED FROM THE PRODUCT SHOULD BE CLASSIFIED AS A HAZARDOUS WASTE (40 CFR 261.20-24).

CONTAINERS:

CONTAINERS SHOULD BE TRIPLE RINSED ACCORDING TO FEDERAL REGULATIONS & /OR GOOD WASTE MANAGEMENT PRACTICES.

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SECTION XIV: TRANSPORTATION INFORMATION

DOT NAME: NOT APPLICABLE
DOT HAZARD CLASS: NOT APPLICABLE
DOT UN/NA NUMBERS: NOT APPLICABLE
DOT REPORTABLE QUANTITY: NOT APPLICABLE
DOT LABELS: NOT APPLICABLE

DOT EMERGENCY RESPONSE INFORMATION:

KEEP UNNECESSARY PEOPLE AWAY. ISOLATE AREA AND DENY ENTRY. STAY UPWIND. KEEP OUT OF LOW AREAS.
CALL 1-973-304-0912 FOR EMERGENCY ASSISTANCE.

SECTION XV: REGULATORY INFORMATION

TSCA STATUS: THE COMPONENTS OF THIS FORMULATED PRODUCT ARE LISTED ON THE TSCA INVENTORY.

OSHA STATUS: THE COMPONENTS OF THIS FORMULATED PRODUCT ARE NOT HAZARDOUS UNDER THE CRITERIA OF THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200.

SARA TITLE III - 302: THE COMPONENTS OF THIS FORMULATED PRODUCT ARE NOT LISTED ON THE SARA TITLE III - SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCE LIST.

SARA TITLE III - 311/312: THE COMPONENTS OF THIS FORMULATED PRODUCT HAVE BEEN REVIEWED ACCORDING TO THE EPA "HAZARD CATEGORIES" PROMULGATED UNDER SECTIONS 311 & 312 OF SARA TITLE III AND IS NOT CONSIDERED TO MEET, UNDER APPLICABLE DEFINITIONS, ANY HAZARD CATEGORY.

SARA TITLE III - 313: THIS PRODUCT DOES NOT CONTAIN ANY SUBSTANCES SUBJECT TO THE ANNUAL REPORTING REQUIREMENTS OF SARA TITLE III SECTION 313 (40 CFR PART 372).

CANADA WHMIS: THIS PRODUCT IS NOT A CONTROLLED PRODUCT ACCORDING TO THE CANADIAN WORKPLACE HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (WHMIS).

STATE INFORMATION: THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES. OTHER PRODUCT SPECIFIC HEALTH & SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMENTS. FOR DETAILS ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

COMPONENT:	FDC RED 40 CASRN: 25956-17-6	NJ TOP 5 INGREDIENTS >1% PA NONHAZARDOUS >3%
	FDC BLUE 1 CASRN: 3844-45-9	NJ TOP 5 INGREDIENTS >1% PA NONHAZARDOUS >3%
	SODIUM BENZOATE CASRN: 532-32-1	NJ TOP 5 INGREDIENTS >1% PA NONHAZARDOUS >3%
	METHYLCELLULOSE CASRN: 9004-67-5	NJ TOP 5 INGREDIENTS >1% PA NONHAZARDOUS >3%

SECTION XVI

LEGEND: N/A - NOT APPLICABLE N/I - NO INFORMATION
N/E - NOT ESTABLISHED N/D - NOT DETERMINED

REASON FOR REVISION: N/A

DISCLAIMER: THIS INFORMATION IS FURNISHED WITHOUT WARRANTY, EXPRESSED OR IMPLIED, EXCEPT THAT IT IS ACCURATE TO THE BEST KNOWLEDGE OF RAINBOW SPECIALTY COLORS, INC. THE DATA ON THIS SHEET RELATES ONLY TO THE SPECIFIC MATERIAL DESIGNATED HEREIN. RAINBOW SPECIALTY COLORS ASSUMES NO LEGAL RESPONSIBILITY FOR USE OR RELIANCE UPON THESE DATA.
END OF THIS MSDS

Corn Starch

14.17.890, 0028, 4519, 4522

SECTION 1 : Identification of the substance/mixture and of the supplier

Product name : Corn Starch

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: **S25580**

Recommended uses of the product and restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific, Inc
9 Barnhart Drive, Hanover, PA 17331
(717) 632-1291

Supplier Details:

Fisher Science Education
6771 Silver Crest Road, Nazareth, PA 18064
(724)517-1954

Emergency telephone number:

Fisher Science Education Emergency Telephone No.: 800-535-5053

SECTION 2 : Hazards identification

Classification of the substance or mixture:

May form combustible dust concentrations in air.

Signal word :Warning

Hazard statements:

Precautionary statements:

Other Non-GHS Classification:

**WHMIS
NFPA/HMIS**

NFPA SCALE (0-4)

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:		
CAS 9005-25-8	Starch, Potato, Reagent Grade	>90 %
Percentages are by weight		

SECTION 4 : First aid measures

Description of first aid measures

After inhalation: Move exposed to fresh air. Give artificial respiration if necessary. If breathing is difficult give oxygen. Consult a physician.

After skin contact: Wash hands and exposed skin with soap and plenty of water. Consult a physician.

Corn Starch

After eye contact: Flush eyes with water as a precaution.

After swallowing: Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

Most important symptoms and effects, both acute and delayed:

Irritation. Headache. Shortness of breath. Nausea.;

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention provide SDS document to physician. Physician should treat symptomatically.

SECTION 5 : Firefighting measures**Extinguishing media**

Suitable extinguishing agents: Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam. Do not inhale gases, fumes, dust, mist, vapor, and aerosols.

For safety reasons unsuitable extinguishing agents:

Special hazards arising from the substance or mixture:

Carbon oxides may be released.

Advice for firefighters:

Protective equipment: Wear protective eyewear, gloves, and clothing. Refer to Section 8.

Additional information (precautions): Avoid generating dust.

SECTION 6 : Accidental release measures**Personal precautions, protective equipment and emergency procedures:**

Ensure adequate ventilation. Ensure that dust-handling systems (exhaust ducts, dust collectors, vessels, and processing equipment) are designed to prevent the escape of dust into the work area.

Environmental precautions:

Prevent from reaching drains, sewer, or waterway. Should not be released into environment.

Methods and material for containment and cleaning up:

Sweep up and containerize for disposal. Avoid generating dust. Always obey local regulations. Sweep up and shovel. Keep in suitable closed containers for disposal. Follow proper disposal methods. Refer to Section 13.

Reference to other sections:**SECTION 7 : Handling and storage****Precautions for safe handling:**

Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. Provide appropriate exhaust ventilation at places where dust is formed. For precautions refer to Section 2.

Conditions for safe storage, including any incompatibilities:

Keep container tightly closed in a cool, dry, and well-ventilated area. Store away from incompatible materials. Refer to Sections 5 and 10.

SECTION 8 : Exposure controls/personal protection

Corn Starch

Control Parameters: 9005-25-8, High-polymeric carbohydrate material, 10 mg/m3 USA. ACGIH Threshold Limit Values (TLV)
 9005-25-8, High-polymeric carbohydrate material, 15 mg/m3 USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
 9005-25-8, High-polymeric carbohydrate material, 5 mg/m3 USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
 9005-25-8, High-polymeric carbohydrate material, 5 mg/m3 USA. NIOSH Recommended Exposure Limits
 9005-25-8, High-polymeric carbohydrate material, 10 mg/m3 USA. NIOSH Recommended Exposure Limits

Appropriate Engineering controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling.

Respiratory protection: Normal ventilation is adequate. Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. When necessary use NIOSH approved breathing equipment.

Protection of skin: Select glove material impermeable and resistant to the substance. Select glove material based on rates of diffusion and degradation. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Eye protection: Wear equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses or goggles.

General hygienic measures: Perform routine housekeeping to prevent dust generation. Do not eat, drink, smoke, or use personal products when handling chemical substances. Wash hands before breaks and immediately after handling the product.

SECTION 9 : Physical and chemical properties

Appearance (physical state,color):	White solid	Explosion limit lower: Explosion limit upper:	Not Available Not Available
Odor:	Not Available	Vapor pressure:	Not Available
Odor threshold:	Not Available	Vapor density:	Not Available
pH-value:	Not Availablen	Relative density:	Not Available
Melting/Freezing point:	Not Available	Solubilities:	
Boiling point/Boiling range:	Not Available	Partition coefficient (n-octanol/water):	Not Available
Flash point (closed cup):	Not Available	Auto/Self-ignition temperature:	Not Available
Evaporation rate:	Not Available	Decomposition temperature:	Not Available

Corn Starch

Flammability (solid,gaseous):	May form combustible dust concentrations in air.	Viscosity:	a. Kinematic:Not Available b. Dynamic: Not Available
Density: Not Available			

SECTION 10 : Stability and reactivity

Reactivity:None under normal processing.
Chemical stability:Stable under normal conditions.
Possible hazardous reactions:
Conditions to avoid:Dust generation. Incompatible materials.
Incompatible materials:Strong oxidizing agents.
Hazardous decomposition products:

SECTION 11 : Toxicological information

Acute Toxicity:		
Oral:	9005-25-8	LD50 Intraperitoneal - Mouse - 6,600 mg/kg
Chronic Toxicity: No additional information.		
Corrosion Irritation:		
Dermal:	9005-25-8	Skin - Human Result: Mild skin irritation - 3 h
Sensitization: No additional information.		
Single Target Organ (STOT): No additional information.		
Numerical Measures: No additional information.		
Carcinogenicity: No additional information.		
Mutagenicity: No additional information.		
Reproductive Toxicity: No additional information.		

SECTION 12 : Ecological information

Ecotoxicity Persistence and degradability:
Bioaccumulative potential:
Mobility in soil:
Other adverse effects:

SECTION 13 : Disposal considerations

Waste disposal recommendations:

Offer surplus and non-recyclable solutions to a licensed disposal company.Contact a licensed professional waste disposal service to dispose of this material.Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.

Corn Starch

SECTION 14 : Transport information

UN-Number

Not Regulated

UN proper shipping name

Not Regulated

Transport hazard class(es)

Packing group:Not Regulated

Environmental hazard:

Transport in bulk:

Special precautions for user:

SECTION 15 : Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

None of the ingredients is listed

SARA Section 313 (Specific toxic chemical listings):

None of the ingredients is listed

RCRA (hazardous waste code):

None of the ingredients is listed

TSCA (Toxic Substances Control Act):

9005-25-8 Not Regulated.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

None of the ingredients is listed

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

None of the ingredients is listed

Canada

Canadian Domestic Substances List (DSL):

9005-25-8 Not Regulated.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

None of the ingredients is listed

SECTION 16 : Other information

Effective date : 11.05.2014

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Corn Starch

GHS Full Text Phrases:

Abbreviations and acronyms:

Effective date : 11.05.2014

Last updated : 05.08.2015

SAFETY DATA SHEET

according to the Commission Regulation (EU) No 453/2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as well as the Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures (CLP)

PRETIOX (product groups A, R, F, S)

This Safety Data Sheet refers to all grades of titanium dioxide PRETIOX within the product groups of PRETIOX A, PRETIOX R, PRETIOX F and PRETIOX S originated from PRECHEZA a.s., manufactured and supplied in a solid state.

SECTION 1: Identification of the substance and of the company

1.1 Product identifier

Titanium dioxide PRETIOX (product groups A, R, F and S, hereinafter referred to as 'the product' or 'the substance') is a chemical substance based on titanium dioxide (TiO₂); CAS 13463-67-7; EINECS 236-675-5; Registration number 01-2119489379-17-0013.

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses are in manufacturing paints, plastics, fibres, paper, leather products, rubber products, enamels, ceramic products, food and cosmetic products as well as in other industrial segments.

Uses advised against: None.

1.3. Details of the supplier of the safety data sheet

Prime Ingredients, Inc.
280 North Midland Ave.
Saddle Brook, NJ. 07663

1.4. Emergency telephone number

Chemtrec: 1-800-424-9300

SECTION 2: Hazards identification

2.1. Classification of the substance

Classification under Regulation (ES) 1272/2008
No classification.

Classification under Directive 67/548/EHS
No classification.

2.2. Label elements

Label elements according to the Regulation (ES) 1272/2008

Signal word: None.

Hazard pictogram: None.

Hazard statement: None.

Precautionary statements: None

Label elements according to the Directive 67/548/EHS

Warning symbol: None.

Risk phrase: None.

Safety phrases: None.

Remark: The product is not a subject to the harmonized classification.

2.3. Other hazards

N/A

SECTION 3: Composition/information on ingredients

3.1. Substances

Main constituent

Name: Titanium dioxide

CAS: 13463-67-7

EINECS: 236-675-5

Impurities

No impurities are relevant to the classification and labelling of the substance.

3.2. Mixtures

N/A

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation: Move to a fresh air atmosphere. In case of persistent difficulties, consult a doctor.

Skin contact: Wash with soap and water.

Eye contact: Rinse immediately with plenty of water. In case of persistent difficulties, consult a doctor.

Ingestion: No adverse health effects anticipated by this route, however, in the event of ingestion, increase intake of liquid in order to flush from the body. In case of persistent difficulties, consult a doctor.

4.2. Most important symptoms and effects, both acute and delayed

Not known.

4.3. Indication of any immediate medical attention and special treatment needed

Not known.

SECTION 5: Fire fighting measures

5.1. Extinguishing media

Suitable extinguishing media: Use any media appropriate to local conditions and surrounding environment.

Unsuitable extinguishing media: None stated.

5.2. Special hazards arising from the substance or mixture

None. The product is inert, non flammable and non combustible.

5.3. Advice for fire-fighters

Use usual personal protective equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid generation of dust. Ensure adequate ventilation. Wear personal protective equipment.

6.2. Environmental precautions

Powder materials: Seal the place of leaking and prevent it leaking into the environment, a sewer system and natural waterways. Inform relevant authorities if a contamination of rivers, lakes or water sources occurs.

Water suspensions: Prevent spillage by means of an appropriate absorption material (sand, broken stone).

6.3. Methods and material for containment and cleaning up

Use any feasible mechanical means (e.g. vacuum, sweeping) but avoid dusting during clean-up. The product can cause slippery conditions if wet. Even at low concentration, the product renders the discharge in liquid effluent highly visible.

6.4. Reference to other sections

Emergency telephone number: see section 1. Exposure controls/personal protection: see section 8. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling: Avoid raising and breathing dust. Observe good industrial hygiene practice for handling chemical substances.

Technical measures: Avoid handling dust. Handling systems and areas should be operated in such a way as to minimise exposure to dust.

Precautions: Local exhaust ventilation may be necessary. Handle minimising dust. Take precautionary measures against static discharges.

Advice on usage: Manual handling guidelines should be adhered to when handling sacks.

7.2. Conditions for safe storage, including any incompatibilities

The product should not be stored in outside areas exposed to the weather. Care should be taken to avoid exposure to moisture.

Packing materials: Paper, plastic.

Incompatible materials: None.

7.3. Specific end use(s)

None addressed.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

General: Ensure sufficient ventilation. Reduce inhalation hazards in minimising the occupational exposure. Comply with the Occupational Exposure Limits found in National Guidance documents. For reducing exposure hazards personal protective equipment, process control as well as health and safety rules should be applied.

DNEL 10 mg/m³ (long-term, inhalation route, generally for nuisance dust, i.e. no specific hazard from the substance)

PNEC aqua (freshwater): 0.127 mg/l

PNEC aqua (marine water): 1 mg/l

PNEC aqua (intermittent releases): 0.61 mg/l

PNEC sediment (freshwater): 1000 mg/kg sediment dw

PNEC sediment (marine water): 100 mg/kg sediment dw

PNEC soil: 100 mg/kg soil dw

PNEC (sewage treatment plant): 100 mg/l

PNEC (oral, mammals): 1667 mg/kg food

8.2. Exposure controls

8.2.1 Appropriate engineering controls

Engineering controls and safe systems of work should be used in preference to Personal Protective Equipment (PPE) to minimise the risk of exposure.

8.2.2 Individual protection measures, such as personal protective equipment

Respiratory protection: A respirator must be used if the dust concentration is likely to exceed the occupational exposure limit. An approved dust respirator is recommended as appropriate depending on dust levels and other workplace factors.

Skin protection: Respect main rules concerning the protection clothes for chemicals handling.
Hand protection: Prolonged exposure should be avoided by wearing suitable impervious protective gloves.

Eye protection: The use of dustproof goggles or glasses with side protections is recommended if dust concentrations are likely to exceed the occupational exposure limit.

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.

8.2.3 Environmental exposure controls

Do not allow material to contaminate ground water system.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- (a) Appearance (20°C, 1013 hPa): Solid, fine crystalline white powder.
- (b) Odour: Odourless.
- (c) Odour threshold: Not applicable (the substance is odourless).
- (d) pH (at 20°C): Not applicable for powder grades (solid).
- (e) Melting point/freezing point (°C): > 1560
- (f) Initial boiling point and boiling range (°C): ca. 3000
- (g) Flash point: Not applicable (solid with a melting point > 1560 °C)
- (h) Evaporation rate: Not applicable (solid with a melting point > 1560 °C)
- (i) Flammability (solid, gas): Non flammable (the substance is inorganic oxide in which the cation is in its highest possible oxidation state and which is incapable of further reaction with oxygen; the substance does not contain chemical groups that might lead to spontaneous ignition after coming in contact with air or that might react with water under development of dangerous amounts of gases which may be flammable)
- (j) Upper/lower flammability or explosive limits: Not applicable (the substance is non flammable and non explosive)
- (k) Vapour pressure: Not applicable (solid with a melting point > 1560 °C)
- (l) Vapour density: Not applicable (solid)
- (m) Relative density (at 20°C): $3900 \div 4260 \text{ kg/m}^3$; bulk density $500 \div 1040 \text{ kg/m}^3$; bulk density tamped $780 \div 1200 \text{ kg/m}^3$
- (n) Solubility in water: < 1 µg/l in the range of pH 6 to 8
- (o) Partition coefficient n-octanol/water: Not applicable (inorganic substance)
- (p) Auto-ignition temperature: Not applicable (the substance is inorganic oxide in which the cation is in its highest possible oxidation state and which is incapable of further reaction with oxygen; the substance is not intrinsically ignitable)
- (q) Decomposition temperature: the product occurs in two crystalline forms, i.e. anatase (CAS No. 1317-70-0) and rutile (CAS No. 1317-80-2); rutile is thermodynamically stable form of the product, anatase rapidly transforms to rutile above 700°C.
- (r) Viscosity: Not applicable (solid)
- (s) Explosive properties: Non explosive (the substance contains titanium in its highest oxidation state)
- (t) Oxidising properties: Not applicable (the substance does not contain a surplus of oxygen or any structural groups with a tendency to react exothermally with a combustible material)

9.2 Other information

Not indicated.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reaction known in case of identified uses.

10.2. Chemical stability

The product is stable under normal conditions.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

Wetting.

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

None known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

a) Acute toxicity:

- oral – $LD_{50} > 5000$ mg/kg bw;
- inhalation – $LC_{50} > 6.82$ mg/l air (MMAD=1.55 μ m, GSD=1.70 μ m)

Based on available data, the classification criteria are not met.

b) Skin corrosion/irritation: according to test OECD Guideline 404 the substance is not irritant.

Based on available data, the classification criteria are not met.

c) Serious eye damage/irritation: according to tests OECD Guideline 405, EU Method B.5 and EPA OPPTS 870.2400 the substance does not cause serious eye damage/irritation. Based on available data, the classification criteria are not met.

d) Respiratory or skin sensitisation: according to tests OECD Guidelines 406 and 429 the substance does not have skin sensitising properties; the substance does not show respiratory sensitising properties in animal studies or in exposure related observations in humans. Based on available data, the classification criteria are not met.

e) Germ cell mutagenicity: the substance was tested (bacterial reverse mutation assays, in vitro gene mutation, clastogenicity test) with a negative test result. Based on available data, the classification criteria are not met.

f) Carcinogenicity: Although carcinogenity studies observed formation of lung tumours under condition of lung particle overload, similar pathological changes are not observed in other experimental species. Detailed epidemiological investigations have shown no causative link between titanium dioxide exposure and cancer risk in humans. At workplace exposure concentrations, no lung cancer hazard has been observed. Based on available data, the classification criteria are not met. Nevertheless, the product is indicated by the IARC Monograph as possibly carcinogenic to humans (group 2B) based on insufficient evidence in humans and on sufficient evidence in experimental animals (IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 93, 2010).

g) Reproductive toxicity: based on the weight of evidence from the available long-term toxicity/carcinogenicity studies in rodents and the relevant information on the toxicokinetic behaviour in rats it is concluded that the substance does not present a reproductive toxicity hazard. Based on available data, the classification criteria are not met.

h) STOT–single exposure: no reversible or irreversible adverse health effects through oral exposure were observed immediately or delayed after exposure. Based on available data, the classification criteria are not met.

i) STOT–repeated exposure: the substance does not show any adverse effects whatsoever in a chronic oral repeated dose toxicity study in rats with a NOAEL of 3500 mg/kg bw/day; the substance is not absorbed to any relevant extent through human skin, thus no toxic effects can be expected via the dermal route of exposure; regarding inhalation route of exposure the following observations have been made in experimental animals and in human epidemiological studies: (i) No systemic toxicity was shown to result from chronic inhalation exposure in rats to high concentrations of pigment grade titanium dioxide, (ii) Particle overload is observed for insoluble particles such as titanium dioxide, whereby the rat is the most sensitive species studied, and species-specific differences are demonstrated in various mechanistic animal studies . It has been demonstrated with reasonable certainty that lung overload conditions are not relevant for human health and, therefore, results based on these data do not justify classification. (iii) It has also been clearly demonstrated through epidemiological studies of titanium dioxide–exposed workers that there is no causal link. Based on available data, the classification criteria are not met.

j) Aspiration hazard: Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

12.1. Toxicity

Acute toxicity to aquatic organisms – fish

All reliable acute toxicity tests to fish resulted in LC₅₀ values ranging from >1 to >10000 mg TiO₂/l, as observed for 4 different fish species in both freshwater and salt water. All these results are taken together in a weight of evidence approach, and it is concluded that TiO₂ is not acute toxic to fish at >1000 mg TiO₂/l and at >10000 mg TiO₂/l in freshwater and marine water, respectively.

Results of test of acute toxicity on fish:

Pimephales promelas LC₅₀ (96 hours): > 1 000 mg/l, tested according to EPA-540/9-85-006, Acute Toxicity Test for Freshwater Fish

Oncorhynchus mykiss LC₅₀ (96 hours): > 100 mg/l, tested in freshwater, according to OECD Guideline 203 (Fish, Acute Toxicity Test)

Oncorhynchus mykiss LC₅₀ (14 days): > 1 mg/l, tested in freshwater where fish were exposed to a different concentration of tested material and several biochemical endpoints in various organs were measured afterwards.

Danio rerio LC₅₀ (48 hours): > 10 mg/l, tested in freshwater, according to American Society of Testing and Materials (ASTM), 2002

Cyprinodon variegatus LC₅₀ (96 hours): > 10 000 mg/l, tested in saltwater, according to OECD Guideline 203 (Fish, Acute Toxicity Test) and according to OSPARCOM (2005-11), Protocol for a fish acute toxicity test.

Acute toxicity to aquatic organisms – invertebrates

All reliable acute toxicity tests to invertebrates resulted in L(E)C₅₀ values ranging from >10 to >10000 mg TiO₂/l, as observed for 4 different invertebrate species in both freshwater and salt water. All these results are taken together in a weight of evidence approach, and it is concluded that TiO₂ is not toxic to aquatic invertebrates at >1000 mg TiO₂/l and at >10000 mg TiO₂/l in freshwater and marine water, respectively.

Results of test of acute toxicity on invertebrates:

Daphnia magna LC₅₀ (48 hours): > 100 mg/l, tested in freshwater, according to Guideline 202 (Daphnia sp. Acute Immobilisation Test)

Daphnia pulex LC₅₀ (48 hours): > 10 mg/l, tested in freshwater, according to American Society for Testing and Materials: Standard guide for conducting acute toxicity tests on test materials with fishes, macro invertebrates and amphibians.

Ceriodaphnia dubia LC₅₀ (48 hours): > 10 mg/l, tested in freshwater, according to American Society for Testing and Materials: Standard guide for conducting acute toxicity tests on test materials with fishes, macro invertebrates and amphibians.

Daphnia magna EC₅₀ (48 hours): > 1000 mg/l, tested in freshwater, according to EPA-660/8-87/011, 1987 and ASTM Standard E729 (1986) and OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test) and U.S. Environmental Protection Agency (660/3-75-009), 1975: Methods for Acute Toxicity Tests with Fish, Macro-invertebrates and Amphibians

Daphnia magna LC₅₀ (48 hours): >= 500 mg/l, tested in freshwater, according to U.S. EPA standard operating procedure 2024

Acartia tonsa LC₅₀ (48 hours): > 10000 mg/l, tested in freshwater, according to ISO 14669 (1999) Water quality-determination of acute lethal toxicity to marine copepods (Copepoda crustacea) a ISO 5667-16 (1998) Water quality sampling-guidance on biotesting of samples

Long-term toxicity to aquatic organisms

No reliable chronic toxicity data are available for aquatic invertebrates. As all acute tests show the absence of toxic effects, there is no need for further investigation of effects to aquatic organisms.

Toxicity to algae and aquatic plants

The lowest value for growth rate was observed for Pseudokirchneriella subcapitata in fresh water: EC₅₀ (72 hours) 61 mg TiO₂/l, test according to OECD Guideline 201 (Alga, Growth Inhibition Test), with a corresponding EC₁₀ (72 hours) of 12.7 mg TiO₂/l. Tests with Skeletonema costatum in marine water result resulted in EC₅₀ of >10000 and a NOEC of 5600 mg TiO₂/l (growth rate), test according to ISO 10253 (Water quality – Marine Algal Growth Inhibition Test with Skeletonema costatum and Phaeodactylum tricornutum).

Toxicity to sediment organisms

EC₅₀/LC₅₀ in marine water sediment: 14989 mg/kg dw (according to test on *Corophium volutator* according to OSPARCOM guidelines (1995) A sediment Bioassay using an amphipod *corophium* sp); EC₁₀/LC₁₀ or NOEC in freshwater sediment: 100000 mg/kg sediment dw (according to test on *Hyalella azteca* according to ASTM E1706).

Toxicity to soil macro-organisms

Long-term EC₁₀/LC₁₀ or NOEC for soil arthropods: 1000 mg/kg soil dw, tested on *Folsomia candida* according to ISO 11267 (Inhibition of Reproduction of Collembola by Soil Pollutants).

Toxicity to terrestrial plants

Long-term EC₁₀/LC₁₀ or NOEC for terrestrial plants: 100000 mg/kg soil dw, tested on *Hordeum vulgare* (Monocotyledonae (monocots) and *Lactuca sativa* (Dicotyledonae (dicots)), according to ISO 11269-2 protocol.

Toxicity to soil micro-organisms

Long-term EC₁₀/LC₁₀ or NOEC for soil micro-organisms: 10000 mg/kg soil dw (tested on species/*Inoculum*: soil, according to ISO 14238).

Toxicity to aquatic micro-organisms in sewage treatment systems

EC₁₀/LC₁₀ or NOEC for aquatic micro-organisms: 1000 mg/l, tested activated sludge of a predominantly domestic sewage, in freshwater, according to OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test).

12.2 Persistence and degradability

Non-persistent. Decomposition and solubility – see section 09.

12.3 Bioaccumulative potential

Aquatic bioaccumulation:

Ti concentrations in various fish tissues stayed constant over the concentration range of TiO₂ in water tested (0-1 mg TiO₂/l), resulting in decreasing BCF with increasing TiO₂ concentrations. The substance is not considered as bioaccumulative.

Terrestrial bioaccumulation:

No reliable results are available for the bioaccumulation of TiO₂ in terrestrial organisms. Read-across approach pointed the absence of bioaccumulation of Ti in plants due to equilibrium conditions for Ti in the environment.

12.4 Mobility in soil

The substance is not mobile in soil.

12.5 Results of PBT and vPvB assessment

Negative. The substance is not PBT and vPvB

12.6 Other adverse effects

Not known.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Waste disposal: Dispose of in compliance with local and national regulations.

Residue: EWC Code 06 11 99, for TiO₂ manufacture or other according to origin of waste. Not classified as hazardous waste.

Contaminated packaging: Contaminated packages are not considered hazardous. If recycling is not practicable, dispose of in compliance with local regulations.

SECTION 14: Transport information

14.1 UN number

Not applicable.

14.2 UN proper shipping name

Not applicable.

14.3 Transport hazard class(es)

Not applicable.

14.4 Packing group
Not applicable.

14.5 Environmental hazards
Not applicable.

14.6 Special precautions for user
See Sections 4 up to 8.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
No limitations.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

There is no legal duty to provide safety data sheet for the substance.

The State of California through The Office of Environmental Health Hazard Assessment (OEHHA) within the California Environmental Protection Agency added titanium dioxide (airborne, unbound particles of respirable size) to the list of chemicals known to the State of California to cause cancer for purposes of the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) using the Labour Code listing mechanism. The listing is based on the International Agency for Research on Cancer's (IARC), Monograph No. 93, published in 2010, that changed the classification of TiO₂ to possibly carcinogenic to humans (2B). The listing does not cover titanium dioxide when it remains bound within a product matrix. The listing of titanium dioxide (airborne, unbound particles of respirable size) is effective September 2, 2011.

This does not require warnings on products containing titanium dioxide, such as on paint / plastics / paper containing titanium dioxide, etc., however, titanium dioxide-containing products sold in the State of California that meet the listing criterion (airborne, unbound particles of respirable size) require the warning under Proposition 65 beginning no later than September 1, 2012. Employee communication for those working with dry titanium dioxide is also required as of the same date.

15.2 Chemical safety assessment

Chemical safety assessment was carried out by the producer.

SECTION 16: Other information

Instructions related to all training of personnel assuring health and environmental protection: Keep all regulations valid for handling with chemical substances and mixtures

Changes have been made to the previous version: Section 01: address of the supplier.

This Safety Data Sheet is revised by the manufacturer After every 12 month after the date of validity. If it conforms, it stays in use, among other on internet pages of manufacturer: www.precheza.cz. If it does not conform, it is updated and issued again with increased number of edition.

This sheet is based on information:

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006, concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Safety Data Sheets of raw material suppliers

Database PhysProp; <http://esc.syrres.com/interkow>

Ecotoxicological database; <http://www.piskac.cz/ETD>

Database ICSC (WHO/IPCS/ILO); <http://www.cdc.gov/niosh/ipcs>

Chemical Safety Report, Titanium Dioxide, Tioxide Europe Limited, (2010)

Information included in this document is given in good faith with accentuation that:

- * *not relevant and/or not applicable legal and/or other requirements and/or qualitative attributes of the product, are stated as „not relevant“, “not applicable“ or “N/A” in this safety data sheet;*
- * *all the hereby given data reflects the best recent stage of knowledge relevant to safety and hygienic requirements;*
- * *all the hereby given data cannot be used as the warranty of the product quality and cannot be used for complaints;*
- * *former application tests are necessary before any use of the product;*
- * *all relevant and known regulations and rules for handling with chemical substances have to be kept in case of use, handling and/or transport the product;*
- * *the exploitation of hereby mentioned information is not controlled by the producer; the producer does not accept responsibility for any injury and/or damage when/where product is used by incompetent manner and/or in applications other than recommended and/or identified;*
- * *the user of the hereby mentioned product is responsible to respect all relevant industrial and patent rights related to the hereby mentioned product.*

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