QINGDAO SANHUAN COLORCHEM CO., LTD.

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MATERIAL SAFETY DATA SHEET

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Titanium Dioxide Rutile SHR-358
Chemical Formula: TiO2
Molecular Weight: 79.90
CAS No.: 13463-67-7
HS Number :3206111900
Company Identification:
QINGDAO SANHUAN COLORCHEM CO., LTD.
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Section 2 - COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT

CHEMICAL NAME	CAS NUMBER	WEIGHT %
Titanium Dioxide	13463-67-7	90-100
Aluminium Hydroxide	21645-51-2	0-4
Zirconium Dioxide	1314-23-4	0-2

See Section 15 of this MSDS for Regulatory status

Section 3 - HAZARDS IDENTIFICATION

Emergency Overview

EMERGENCY OVERVIEW

CAUSES IRRITATION TO EYES! Will not burn, but may be involved in a fire with other materials. In case of fire, use extinguishing media suitable for the material that is burning. Color: White.
Physical Form: Powder.
Odor: Odorless.
Major Health Hazards: Respiratory irritation, eye irritation, mucous membrane irritation.

Potential Health Effects

POTENTIAL HEALTH EFFECTS

INHALATION (Short Term Exposure): May cause irritation of nose, throat, and lungs with cough, difficulty breathing or shortness of breath.
SKIN CONTACT: May irritate skin, especially if not promptly washed off skin. EYE

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CONTACT: May cause mechanical eye irritation.
INGESTION: No adverse health effects anticipated by this route.

CHRONIC EFFECTS / CARCINOGENICITY: Titanium dioxide has been characterized by IARC as possibly carcinogenic to humans (Group 2B) through inhalation (not ingestion). Epidemiology studies do not suggest an increased risk of cancer in humans from occupational exposure to titanium dioxide.

CARCINOGEN STATUS: IARC classification: 2B.
NTP classification: Not listed as carcinogen.

OSHA classification: Not listed as carcinogen.

ACGIH classification: Not listed as carcinogen.

Section 4 : First Aid Measures

Inhalation: Remove person to fresh air. If person appears to have difficulty breathing or respiratory irritation, seek medical attention.

Ingestion: If swallowed, give several glasses of water to drink. Vomiting may occur spontaneously, but DO NOT INDUCE! Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact: Wipe off excess material from skin then flush skin with Wash skin thoroughly with soap and water. Remove contaminated clothing and shoes.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Seek medical attention if irritation develops or persists.
NOTE TO PHYSICIAN: For inhalation, consider oxygen.

Section 5 : Fire Fighting Measures
Fire: Not considered to be a fire hazard. Will not burn.

Explosion: Sealed containers may rupture when heated.

Fire Extinguishing Media: Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool.
Special Information: In the event of a fire, wear full protective clothing and NIOSH-approved

self-contained breathing apparatus with full facepiece operated in the

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pressure demand or other positive pressure mode. Sealed containers of this material may rupture at moderate temperatures (release of water vapor).

Section 6 : Accidental Release Measures

Soil Release: Dig holding area such as lagoon, pond or pit for containment. Scoop up material and all contaminated soil for later disposal. Cover with plastic sheet or tarp to minimize spreading and protect from contact with water.

Water Release: Use vacuum techniques and containment devices to prevent spread and remove material from water source for later disposal.
Occupational Release: Ventilate area of leak or spill. Keep unnecessary and unprotected people away

from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

Section 7 : Handling and Storage

HANDLING
Personnel: Avoid contact with the eyes; avoid breathing dust or mist.

Handling environment: Avoid high concentrations of dust or mist in air through the use of ventilation or other suitable controls.

Please refer to Section 8 for engineering control and personal protection equipment information. Warning: At the final stage of production, titanium dioxide product is packaged at temperatures of approximately 100 to 120°C (212 to 248°F). The material may stay hot for a long time depending on ambient temperatures and inventory storage practices. Due to the potential of elevated pigment temperature, caution should be used while handling pigment and in solvent applications. Each work environment must be assessed to determine hazards.

STORAGE

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage; observe all warnings and precautions listed for the product.

Section 8 : Exposure Controls/Personal Protection

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EXPOSURE LIMITS

COMPONENT	OSHA PEL TWASTEL	ACGIH TLV TWASTEL
Titanium dioxide-total dust	15 mg/m3Not established	10 mg/m3Not established Not established Not established
Aluminum hydroxide	Not established	Not established
Amorphous silica	20 mppcf or 80 mg/m3 % SiO2	10 mg/m3Not established

ENGINEERING CONTROLS
Ventilation System: A system of local and/or general exhaust is recommended to keep employee

exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.
Other: Emergency eye bath and washing facilities.

PERSONAL PROTECTION

Personal Respirators (NIOSH Approved): For conditions of use where exposure to the dust or mist is apparent, a half-face dust/mist respirator may be worn. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. If respirators are used, OSHA requires compliance with its respiratory protection program (29 CFR1910.134).

WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls.

Eye Protection: Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.
Clothing: Wear appropriate and easily washable clothing. Wash clothing after each shift.
Gloves: impervious gloves or none specified by manufacturer.

General: Do not eat, drink, or smoke in work area. Practice good

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personal hygiene after using this material, especially before eating, drinking, smoking, using toilet facilities or applying cosmetics.

Section 9 : Physical and Chemical Properties

State: Powdered solid.

Color: White.
Odor: None.

Solubility: Insoluble in water.
Molecular Weight: 79.90.
Molecular Formula: TiO2.
Specific Gravity (@ 20°C): 3.8 - 4.2.
PH: 6-8.5 (10% slurry).
Melting point: 1850°C (approximately).
Boiling Point: 2500-3000°C.
Volatiles by volume @ 21°C (70°F): <1%.
Vapor Density (Air=1): Not volatile.

Vapor Pressure (mm Hg): Not available.

Evaporation Rate (BuAc=1): Not volatile.
Coefficient of Water/Oil Distribution: Not available.

Section 10 : Stability and Reactivity

Stability: Stable under ordinary conditions of use and storage.

Reactivity: Stable at normal temperatures and pressure.
Conditions to Avoid: Avoid contact with metals at high temperatures.
Polymerization: Will not polymerize.
Hazardous Decomposition Products: None in normal or expected use.
Hazardous Polymerization: Will not occur.

Section 11 : Toxicological Information

HEALTH HAZARDS
Inhalation: Inhalation of dust or mist can cause irritation of the eyes, nose, throat, and lungs. Eye
Contact: Like any foreign body, particles can cause mechanical irritation.
Skin Contact: This material can cause irritation if not promptly washed from the skin.
Skin Absorption: This product is not expected to be absorbed through intact skin.
Ingestion: This material is not expected to produce adverse effects.

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ACUTE TOXICITY (ANIMAL DATA)

Titanium Dioxide:

Oral ALD: >24,000 mg/kg in rats
Dermal ALD: >10,000 mg/m3 in rabbits
Inhalation 4-hour ALC: >6.82 mg/L in rats

Amorphous Silica:
Oral LD50: >10,000 mg/kg in rats

The above information and data are obtained on the basis of third-party research studies.
and inflammation that causes lung
cancer. Epidemiology studies do not suggest an increase risk of cancer in humans from occupational
exposure to titanium dioxide.
Titanium dioxide has been characterized by IARC as possible carcinogenic to humans (Group 2B) through
inhalation(Not ingestion) It has not been characterized as potential carcinogen by either NTP or OSHA.
Alumina oxide, Zirconium oxide, Silicon oxide: Inhalation of dust particles composed of these material may
cause drying of mucous membranes and irritation of nose, throat and lungs with nosebleeds, cough,
difficulty breath or shortness of breath. Based on animal studies, long time inhalation exposure to high
doses of ultrafine particles could lead pulmonary and inflammation and could be a factor in subsequent
development of chronic lung disease. Silicon oxide does not induce the lung effects associated with
crystalline silica.
Medical conditions Aggravated: Respiratory disorder
Toxicity: Titanium dioxide
Oral LD 50 >10,000 mg/kg (rate)
Dermal LD 50 >10,000 mg/kg (rabbit)
Inhalation LD (4 hr) >6.8 mg/l (rat)

SECTION 12: ECOLOGICAL INFORMATION
For Titanium Dioxide

E.I. DuPont's Haskel Toxicology Laboratory conducted an aquatic toxicity study on titanium dioxide and determined the following:
Acqute toxicity:
96 hour LC50 (fathead minnows): >1000mg/L

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Section 13 : Disposal Considerations

RCRA Waste Code: Not regulated.

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations.Dispose of container and unused contents in accordance with federal, state and local requirements.

Section 14 : Transport Information

SHIPPING INFORMATION
Not regulated as a hazardous material by DOT, TDG, IATA or IMDG.

SHIPPING CONTAINERS
Tank Cars, Tank Trucks, Flexible Intermediate Bulk Containers, Tote Bins, Bags.

SECTION 15 REGULATORY INFORMATION

US FEDERAL REGULATIONS
TSCA Inventory Status: Listed / No specific regulations apply.
TITLE III HAZARD CLASSIFICATIONS: SECTIONS 311, 312.
Acute: Yes.
Chronic: No.
Fire: No.
Reactivity: No.
Pressure: No.
LISTS:

Extremely Hazardous Substance: No.

CERCLA Hazardous Substance: No.

Toxic Chemical: No.

CANADIAN REGULATIONS
WHMIS Classification: CLASS D Division 2 Subdivision A - Very Toxic Material.

Carcinogen: This product has been classified in accordance with hazard criteria of the Hazardous Products Act and Controlled Product Regulations (WHMIS).
CEPA Status: Domestic Substances List: Listed.

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SECTION 16 OTHER INFORMATION

NFPA, NPCA-HMIS

NPCA-HMIS RATING: Health: 1
Flammability: 0
Reactivity: 0
PERSONAL PROTECTION RATING: To be supplied by user depending on use conditions.

VERSION INFORMATION

MSDS Version No.: 0902RT

Prepared by: Research & Development Department of QINGDAO SANHUAN COLORCHEM CO., LTD.
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