

MATERIAL SAFETY DATA SHEET

SECTION 1: PRODUCT IDENTIFICATION

MANUFACTURE ISHIHARA SANGYO, KAISHA, LTD. 3-15 EDOBORI, 1-CHOME NISHI-KU, OSAKA JAPAN	U. S. DISTRIBUTOR ISHIHARA CORPORATION (U. S. A.) 601 CALIFORNIA ST., STE 1700 SAN FRANCISCO, CA 94108 (415) 421-8207
EMERGENCY TELEPHONE NUMBER : (800) 424-9300 (CHEMTREC)	

Chemical Name and Synonyms	Titanium Dioxide, Titanium White, Titania
Trade Name and Synonyms	TIPAQUE R-670
C A S No.	1 3 4 6 3 - 6 7 - 7
Chemical Family	Inorganic Oxide
Formula	TiO ₂

SECTION 2: HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT	CAS. NO	%	PEL (OSHA)	TLV (ACGIH)
Titanium Dioxide	13463-67-7	Min. 93.0	15mg/cu. m. (total) 5mg/cu. m. (Respirable)	10mg/cu. m.
Aluminum Hydroxide	21645-51-2	Max. 5.0	Non established	2mg (Al) /cu. m.
Titanium Dioxide is listed in Group 2B (Possibly Carcinogenic to human) by IARC.				

SECTION 3: PHYSICAL DATA

Appearance (Solid, Liquid, Gas)	Powder	Boiling Point	Not applicable
Color	White	Specific Gravity	3.9 ~ 4.2
Solubility in Water	Insoluble	Bulk Density	0.2 ~ 1.2
Volatile by Volume	Not applicable	Vapor Density (Air=1)	Not applicable

SECTION 4 : FIRE AND EXPLOSION HAZARD DATA

Flash Point	Incombustible
Flammable Limits	Incombustible
Extinguishing Media	Not required
Special Fire Fighting Procedures	Not required
Unusual Fire and Explosion Hazards	None

SECTION 5 : HEALTH HAZARD DATA

Effects of Overexposure	Irritating to respiratory system
Emergency and First Aid Procedures	<p>Eye: Wash gently with water</p> <p>Skin: Wash with water and soap</p> <p>Inhalation: Remove Person from dust contaminated area</p> <p>Ingestion: In case of excessive ingestion, drink a quart or more of water, followed by a glass of milk and call physician</p>

SECTION 6 : TOXICOLOGICAL INFORMATION

- (1) Skin Corrosion : No specific records available.
- (2) Irritants
 - Dermal : Very slight irritation to the skin could occur. 1)
 - Respiratory : Gross overexposure by inhalation may include mild and temporary upper respiratory irritation. 2)
- (3) Acute Toxicity
 - Oral Administration : LD₅₀ >12000mg/Kg in rats. 3), 4)
 - Intramuscular Injection : TDLo 360mg/Kg/2 years in rats. 5)
 - TD 260mg/Kg/84weeks in rats. 6)
 - Inhalation : No evidence of lung disease in humans and animals under long-term exposure to respirable TiO₂. 7)
 - TCLo 250mg/m³/6Hrs/2years in rats. 8)
- (4) Chronic Toxicity
 - No specific signs of toxicity were observed in dogs, cats, rabbits and pigs after ingestion of TiO₂ over 390 days. 4)
- (5) Carcinogenicity
 - IARC : Group 2B (Possibly carcinogenic to humans) 7)
- (6) Mutagenic Activity
 - No literature available.

SECTION 7: SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type)	If exposure limits may be exceeded, use OSHA permissible respirator
Protective Gloves	Optional : May be worn to protect skin if there is any drying effect from dust
Eye Protection	Safety glasses or goggles are suggested if dust is present
Other Protective Equipment	Not required

SECTION 8: REACTIVITY DATA

Stability	Inert to most chemicals, reagents. Stable under all conditions
Incompatibility (Materials to Avoid)	None
Hazardous decomposition or byproducts	None (No Decomposition products)
Hazardous Polymerization conditions to avoid	Will not occur None

SECTION 9: PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released or spilled:

Use any feasible mechanical means to remove "spilled" material, such as broom, brush, scoop, vacuum, or wet absorbent materials, but avoid spreading dust during clean up.

Waste disposal method

Comply with Federal, State and local regulations

Precautions to be taken in handling and storing

Store in clean, dry place. Keep work area free of spill.
Avoid ingestion as a common sense measure.

SECTION 10: SPECIAL PRECAUTIONS

HMIS Rating	
Health	1
Flammability	0
Reactivity	0
Maximum Personal Protection	E

SECTION 11: REGULATORY INFORMATION

TSCA	All component are listed on TSCA inventory.
TSCA 12b(Export)	Notification not required.
Canadian DSL	All component are listed on DSL inventory.
SARA III	
Section 311	No
Section 312	No
Section 313	No
Calif. Proposition 65	None listed
CERCLA RQ	None
IATA	Not regulated
DOT	Not regulated

REFERENCES

- 1) Cutaneous Toxicity V.A. Drill and P. Iasar. eds., New York, Academic Press p127 (1977)
- 2) TITANIUM DIOXIDE (Japan Titanium Dioxide Industry Association) P.1 No62(1988)
- 3) FRAGRANCE JOURNAL P.4 No80(1986)
- 4) IPCS Environmental Health Criteria 24. Titanium(1982)
- 5) Progress Report for Contract No. PH-43-64-886, Submitted to the National Cancer Institute by the Institute of Chemical Biology, University of San Francisco., AUG(1968)

- 6) Progress Report for Contract No. PH-43-64-886, Submitted to the National Cancer Institute by the Institute of Chemical Biology, University of San Francisco., AUG(1969)
- 7) IARC RECENTLY EVALUATED 「TITANIUM DIOXIDE」 5. SUMMERY OF DATA REPORTED POSTED 27 FEBRUARY 2006
- 8) Toxicology and Applied Phamacology, 79, p179(1985)

Although the information contained herein was believed to be accurate at the time of preparation, ISHIHARA SANGYO KAISYA makes no guarantees and assume no responsibility for how this information is used. Users of this product should independently research data that may be pertinent to their application.

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