

# MATERIAL SAFETY DATA SHEET

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**MATHESON TRI-GAS, INC.**  
**150 Allen Road Suite 302**  
**Basking Ridge, New Jersey 07920**  
**Information: 1-800-416-2505**

**Emergency Contact:**  
**CHEMTREC 1-800-424-9300**  
**Calls Originating Outside the US:**  
**703-527-3887 (Collect Calls Accepted)**

### **SUBSTANCE: TITANIUM TETRACHLORIDE**

#### **TRADE NAMES/SYNONYMS:**

MTG MSDS 165; TITANIUM CHLORIDE; TITANIC CHLORIDE; TETRACHLOROTITANIUM;  
TITANIUM CHLORIDE (TiCl<sub>4</sub>) (T-4)-; TITANIUM(IV) CHLORIDE; T-308; UN 1838; Cl<sub>4</sub>Ti;  
MAT23550; RTECS XR1925000

**CHEMICAL FAMILY:** inorganic, salt

**CREATION DATE:** Aug 16 1990

**REVISION DATE:** Dec 11 2008

## 2. COMPOSITION, INFORMATION ON INGREDIENTS

**COMPONENT:** TITANIUM TETRACHLORIDE  
**CAS NUMBER:** 7550-45-0  
**PERCENTAGE:** 100.0

## 3. HAZARDS IDENTIFICATION

**NFPA RATINGS (SCALE 0-4):** HEALTH=4 FIRE=0 REACTIVITY=2



#### **EMERGENCY OVERVIEW:**

**CHANGE IN APPEARANCE:** moisture-sensitive

**COLOR:** colorless or yellow

**PHYSICAL FORM:** fuming liquid

**ODOR:** irritating odor

**MAJOR HEALTH HAZARDS:** potentially fatal if inhaled, respiratory tract burns, skin burns, eye burns, mucous membrane burns

**PHYSICAL HAZARDS:** May react on contact with air, heat, light or water.

#### **POTENTIAL HEALTH EFFECTS:**

**INHALATION:**

**SHORT TERM EXPOSURE:** burns, vomiting, difficulty breathing, dizziness, bluish skin color, lung congestion, death

**LONG TERM EXPOSURE:** tooth decay, digestive disorders, lung damage

**SKIN CONTACT:**

**SHORT TERM EXPOSURE:** burns

**LONG TERM EXPOSURE:** same as effects reported in short term exposure

**EYE CONTACT:**

**SHORT TERM EXPOSURE:** burns, tearing, blindness

**LONG TERM EXPOSURE:** same as effects reported in short term exposure

**INGESTION:**

**SHORT TERM EXPOSURE:** burns, nausea, vomiting, diarrhea, stomach pain, difficulty breathing, kidney damage, convulsions, coma

**LONG TERM EXPOSURE:** same as effects reported in short term exposure

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## 4. FIRST AID MEASURES

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**INHALATION:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

**SKIN CONTACT:** Remove contaminated clothing, jewelry, and shoes immediately. Wipe all material off skin before washing to prevent burns. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). If burns occur, cover affected area securely with sterile, dry, loose-fitting dressing. Get medical attention, if needed.

**EYE CONTACT:** Wipe all material off skin around eyes before washing. Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains. Get medical attention immediately.

**INGESTION:** Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. Give large amounts of water or milk. Allow vomiting to occur. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

**NOTE TO PHYSICIAN:** For inhalation, consider oxygen. Avoid gastric lavage or emesis.

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## 5. FIRE FIGHTING MEASURES

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**FIRE AND EXPLOSION HAZARDS:** Negligible fire hazard.

**EXTINGUISHING MEDIA:** carbon dioxide, regular dry chemical

Large fires: Flood with water. Apply water from a protected location or from a safe distance.

**FIRE FIGHTING:** Do not get water inside container. Do not scatter spilled material with high-pressure water streams. Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks.

**FLASH POINT:** not flammable

**HAZARDOUS COMBUSTION PRODUCTS:**

Thermal decomposition or combustion products: hydrochloric acid, oxides of titanium

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## 6. ACCIDENTAL RELEASE MEASURES

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**OCCUPATIONAL RELEASE:**

Avoid contact with combustible materials. Do not touch spilled material. Do not get water inside container. Stop leak if possible without personal risk. Reduce vapors with water spray. Do not get water directly on material. Only personnel trained for the hazards of this material should perform clean up and disposal. Dike for later disposal. Do not use water. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

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## 7. HANDLING AND STORAGE

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**STORAGE:** Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store outside or in a detached building. Store in a cool, dry place. Store in a tightly closed container. Keep separated from incompatible substances. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355 Part B).

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## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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**EXPOSURE LIMITS:**

**TITANIUM TETRACHLORIDE:**

0.5 mg/m<sup>3</sup> AIHA WEEL TWA

**VENTILATION:** Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**EYE PROTECTION:** Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

**CLOTHING:** Wear appropriate chemical resistant clothing.

**GLOVES:** Wear appropriate chemical resistant gloves.

**PROTECTIVE MATERIAL TYPES:** polyvinyl chloride (PVC), rubber

**RESPIRATOR:** Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.

Any chemical cartridge respirator with organic vapor cartridge(s).

Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).

Any air-purifying respirator with a full facepiece and an organic vapor canister.

**For Unknown Concentrations or Immediately Dangerous to Life or Health -**

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**PHYSICAL STATE:** liquid

**COLOR:** colorless or yellow

**CHANGE IN APPEARANCE:** moisture-sensitive

**PHYSICAL FORM:** fuming liquid

**ODOR:** irritating odor

**MOLECULAR WEIGHT:** 189.69

**MOLECULAR FORMULA:** Ti-Cl<sub>4</sub>

**BOILING POINT:** 277 F (136 C)

**FREEZING POINT:** -13 F (-25 C)

**VAPOR PRESSURE:** 23 mmHg @ 38 C

**VAPOR DENSITY (air=1):** 6.6

**SPECIFIC GRAVITY (water=1):** 1.726

**WATER SOLUBILITY:** reacts violently

**PH:** Not available

**VOLATILITY:** Not available

**ODOR THRESHOLD:** Not available

**EVAPORATION RATE:** Not available

**COEFFICIENT OF WATER/OIL DISTRIBUTION:** Not available

**SOLVENT SOLUBILITY:**

**Soluble:** dilute hydrochloric acid, alcohol

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## 10. STABILITY AND REACTIVITY

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**REACTIVITY:** May react with evolution of heat on contact with water. Releases toxic, corrosive, flammable or explosive gases.

**CONDITIONS TO AVOID:** Avoid contact with combustible materials. Keep dry. Dangerous gases may accumulate in confined spaces. Keep out of water supplies and sewers.

**INCOMPATIBILITIES:** acids, combustible materials, metals, peroxides

**HAZARDOUS DECOMPOSITION:**

Decomposition products on contact with water or moisture: hydrochloric acid, oxides of titanium  
Thermal decomposition or combustion products: hydrochloric acid, oxides of titanium

**POLYMERIZATION:** Will not polymerize.

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## 11. TOXICOLOGICAL INFORMATION

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**TITANIUM TETRACHLORIDE:**

**TOXICITY DATA:** 400 mg/m<sup>3</sup> inhalation-rat LC50; 3160 mg/kg skin-rabbit LD50

**LOCAL EFFECTS:**

Corrosive: inhalation, skin, eye, ingestion

**ACUTE TOXICITY LEVEL:**

Highly Toxic: inhalation

Slightly Toxic: dermal absorption

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** eye disorders, heart or cardiovascular disorders, respiratory disorders, skin disorders and allergies

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## 12. ECOLOGICAL INFORMATION

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Not available

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## 13. DISPOSAL CONSIDERATIONS

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Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D003.

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## 14. TRANSPORT INFORMATION

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**U.S. DOT 49 CFR 172.101:**

**PROPER SHIPPING NAME:** Titanium tetrachloride

**ID NUMBER:** UN1838

**HAZARD CLASS OR DIVISION:** 8

**PACKING GROUP:** II



**LABELING REQUIREMENTS:** 8; 6.1  
**QUANTITY LIMITATIONS:**  
**PASSENGER AIRCRAFT OR RAILCAR:** Forbidden  
**CARGO AIRCRAFT ONLY:** Forbidden

**CANADIAN TRANSPORTATION OF DANGEROUS GOODS:**  
**SHIPPING NAME:** Titanium tetrachloride  
**UN NUMBER:** UN1838  
**CLASS:** 8  
**PACKING GROUP/CATEGORY:** II

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## 15. REGULATORY INFORMATION

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### U.S. REGULATIONS:

**CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):**  
**TITANIUM TETRACHLORIDE:** 1000 LBS RQ

**SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B):**  
**TITANIUM TETRACHLORIDE:** 100 LBS TPQ

**SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C):**  
**TITANIUM TETRACHLORIDE:** 1000 LBS RQ

**SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):**  
ACUTE: Yes  
CHRONIC: No  
FIRE: No  
REACTIVE: Yes  
SUDDEN RELEASE: No

**SARA TITLE III SECTION 313 (40 CFR 372.65):**  
**TITANIUM TETRACHLORIDE**

**OSHA PROCESS SAFETY (29 CFR 1910.119):** Not regulated.

### STATE REGULATIONS:

**California Proposition 65:** Not regulated.

### CANADIAN REGULATIONS:

**WHMIS CLASSIFICATION:** Not determined.

### NATIONAL INVENTORY STATUS:

**U.S. INVENTORY (TSCA):** Listed on inventory.

**TSCA 12(b) EXPORT NOTIFICATION:** Not listed.

**CANADA INVENTORY (DSL/NDSL):** Not determined.

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## 16. OTHER INFORMATION

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### MSDS SUMMARY OF CHANGES

7. HANDLING AND STORAGE

15. REGULATORY INFORMATION

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