

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

Product form	: Substance
Physical state	: Liquid
Substance name	: TITANIUM TETRACHLORIDE, 99%
Product code	: INTI065
Formula	: Cl <sub>4</sub> Ti
Synonyms	: TITANIUM IV CHLORIDE
Chemical family	: METAL COMPOUND

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

#### 1.2.1. Relevant identified uses

Use of the substance/mixture : Chemical intermediate

#### 1.2.2. Uses advised against

No additional information available

### 1.3. Details of the supplier of the safety data sheet

#### GELEST, INC.

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Morrisville, PA 19067

#### USA

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[info@gelestde.com](mailto:info@gelestde.com) - [www.gelestde.com](http://www.gelestde.com)

### 1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

#### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Skin corrosion/irritation, Category 1B	H314
Serious eye damage/eye irritation, Category 1	H318
Full text of H statements : see section 16	

#### Adverse physicochemical, human health and environmental effects

No additional information available

### 2.2. Label elements

#### Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



GHS05

Signal word (CLP)	: Danger
Hazard statements (CLP)	: H314 - Causes severe skin burns and eye damage.
Precautionary statements (CLP)	: P280 - Wear protective gloves/protective clothing/eye protection/face protection. P260 - Do not breathe mist, vapours. P264 - Wash hands thoroughly after handling.

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P405 - Store locked up.  
P310 - Immediately call a POISON CENTER or doctor/physician  
P501 - Dispose of contents/container to licensed waste disposal facility..

EUH-statements : EUH014 - Reacts violently with water.

### 2.3. Other hazards

Other hazards not contributing to the classification : Hydrogen chloride may be formed by reaction with water and moisture in air. The US OSHA PEL (TWA) for hydrogen chloride is 5 ppm.

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Substance type : Mono-constituent  
Name : TITANIUM TETRACHLORIDE, 99%  
CAS-No. : 7550-45-0  
EC-No. : 231-441-9  
EC Index-No. : 022-001-00-5

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Titanium tetrachloride	(CAS-No.) 7550-45-0 (EC-No.) 231-441-9 (EC Index-No.) 022-001-00-5	99 - 100	Skin Corr. 1B, H314

Full text of H-statements: see section 16

### 3.2. Mixtures

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general : Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.  
First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If you feel unwell, seek medical advice.  
First-aid measures after skin contact : Wash with plenty of water/.... Get immediate medical advice/attention.  
First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Get immediate medical advice/attention.  
First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Get medical advice/attention.

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

Symptoms/effects : Causes severe skin burns and eye damage.  
Symptoms/effects after inhalation : Fatal if inhaled. May cause respiratory irritation. May cause pulmonary edema, respiratory tract inflammation, and pulmonary fibrosis.  
Symptoms/effects after skin contact : Causes (severe) skin burns.  
Symptoms/effects after eye contact : Causes serious eye damage.  
Symptoms/effects after ingestion : Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

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

No additional information available

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide. Dry chemical. Use of high expansion foam (100:1) is recommended to cover flames.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : Irritating dense white fumes of titanium dioxide and hydrogen chloride develop when material is exposed to water or open flame.  
Explosion hazard : Titanium tetrachloride is not flammable. The following information is provided to assist if titanium tetrachloride is present in a fire situation.

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### 5.3. Advice for firefighters

- Firefighting instructions : Use only dry media to extinguish flames. Water spray or fog should only be used to knock down hydrogen chloride vapors in areas downwind from the fire.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapour and mist.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

- Emergency procedures : Evacuate unnecessary personnel.

#### 6.1.2. For emergency responders

- Protective equipment : Equip cleanup crew with proper protection.

### 6.2. Environmental precautions

- Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

### 6.3. Methods and material for containment and cleaning up

- Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal.

### 6.4. Reference to other sections

- See Heading 8. Exposure controls and personal protection.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

- Precautions for safe handling : Avoid all eye and skin contact and do not breathe vapour and mist. Provide good ventilation in process area to prevent formation of vapour.
- Hygiene measures : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse.

### 7.2. Conditions for safe storage, including any incompatibilities

- Storage conditions : Keep container tightly closed. Store in sealed corrosion resistant containers.
- Incompatible materials : Acids. alcohols. Moisture. Oxidizing agent. Water :
- Storage area : Store in a well-ventilated place. Store away from heat.

### 7.3. Specific end use(s)

- No additional information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Titanium tetrachloride (7550-45-0)		
Romania	OEL TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup>
Romania	OEL STEL (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup>

### 8.2. Exposure controls

#### Appropriate engineering controls:

- Handle in an enclosing hood with exhaust ventilation.

#### Personal protective equipment:

- Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

#### Hand protection:

- Neoprene or nitrile rubber gloves

#### Eye protection:

- Chemical goggles or face shield. Contact lenses should not be worn

#### Skin and body protection:

- Wear suitable protective clothing

#### Respiratory protection:

- In case of insufficient ventilation, wear suitable respiratory equipment

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### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Clear liquid. Forms dense white fumes on contact with air.
Molecular mass	: 189.71 g/mol
Colour	: Straw.
Odour	: Acrid. Similar to hydrogen chloride.
Odour threshold	: No data available
Refractive index	: No additional information available
pH	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: No data available
Freezing point	: -24 °C
Boiling point	: 136.4 °C
Flash point	: 104 °C
Auto-ignition temperature	: not ignitable
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: 1.27 kPa @ 20 °C
Relative vapour density at 20 °C	: 1.07
Relative density	: 1.73
% Volatiles	: 100 %
Solubility	: Reacts violently with water.
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: 0.5 cSt
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

#### 9.2. Other information

No additional information available

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

No additional information available

#### 10.2. Chemical stability

Stable in sealed corrosion resistant containers stored under a dry inert atmosphere.

#### 10.3. Possibility of hazardous reactions

Reacts with water and moisture in air, liberating dense white fumes of titanium dioxide and hydrogen chloride.

#### 10.4. Conditions to avoid

No additional information available

#### 10.5. Incompatible materials

Acids. alcohols. Moisture. Oxidizing agent. Water :

#### 10.6. Hazardous decomposition products

Hydrogen chloride. Titanium dioxide.

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

Acute toxicity : Not classified

#### TITANIUM TETRACHLORIDE, 99% (7550-45-0)

LD50 oral rat	1780 mg/kg
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#### Titanium tetrachloride (7550-45-0)

LD50 oral rat	464 mg/kg
LD50 dermal rabbit	3160 mg/kg
LC50 inhalation rat (mg/l)	0.4 mg/l/4h

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Skin corrosion/irritation	: Causes severe skin burns and eye damage.
Serious eye damage/irritation	: Causes serious eye damage.
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified
STOT-repeated exposure	: Not classified
Aspiration hazard	: Not classified
Symptoms/effects after inhalation	: Fatal if inhaled. May cause respiratory irritation. May cause pulmonary edema, respiratory tract inflammation, and pulmonary fibrosis.
Symptoms/effects after skin contact	: Causes (severe) skin burns.
Symptoms/effects after eye contact	: Causes serious eye damage.
Symptoms/effects after ingestion	: Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.
Reason for classification	: Expert judgment

## SECTION 12: Ecological information

### 12.1. Toxicity

Hazardous to the aquatic environment, short-term (acute)	: Not classified
Hazardous to the aquatic environment, long-term (chronic)	: Not classified

### 12.2. Persistence and degradability

No additional information available

### 12.3. Bioaccumulative potential

No additional information available

### 12.4. Mobility in soil

No additional information available

### 12.5. Results of PBT and vPvB assessment

No additional information available

### 12.6. Other adverse effects

Other adverse effects : This substance may be hazardous to the environment.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Product/Packaging disposal recommendations	: Dispose of contents/container to licensed waste disposal facility.. Dispose in a safe manner in accordance with local/national regulations.
Ecology - waste materials	: Avoid release to the environment.

## SECTION 14: Transport information

### 14.1. UN number

In accordance with ADR / RID / IMDG / IATA / ADN

#### 14.1. UN number

UN-No. (ADR)	: 1838
UN-No. (IMDG)	: 1838
UN-No. (IATA)	: 1838
UN-No. (ADN)	: 1838
UN-No. (RID)	: 1838

#### 14.2. UN proper shipping name

Proper Shipping Name (ADR)	: TITANIUM TETRACHLORIDE
Proper Shipping Name (IMDG)	: TITANIUM TETRACHLORIDE
Proper Shipping Name (IATA)	: Titanium tetrachloride
Proper Shipping Name (ADN)	: TITANIUM TETRACHLORIDE
Proper Shipping Name (RID)	: TITANIUM TETRACHLORIDE
Transport document description (ADR)	: UN 1838 TITANIUM TETRACHLORIDE, 6.1 (8), I, (C/D)

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Transport document description (IMDG) : UN 1838 TITANIUM TETRACHLORIDE, 6.1 (8), I  
Transport document description (IATA) : UN 1838 Titanium tetrachloride, 6.1  
Transport document description (ADN) : UN 1838 TITANIUM TETRACHLORIDE, 6.1 (8), I  
Transport document description (RID) : UN 1838 TITANIUM TETRACHLORIDE, 6.1 (8), I

### 14.3. Transport hazard class(es)

#### ADR

Transport hazard class(es) (ADR) : 6.1 (8)  
Danger labels (ADR) : 6.1, 8



#### IMDG

Transport hazard class(es) (IMDG) : 6.1 (8)  
Danger labels (IMDG) : 6.1, 8



#### IATA

Transport hazard class(es) (IATA) : 6.1 (8)

#### ADN

Transport hazard class(es) (ADN) : 6.1 (8)  
Danger labels (ADN) : 6.1, 8



#### RID

Transport hazard class(es) (RID) : 6.1 (8)  
Danger labels (RID) : 6.1, 8



### 14.4. Packing group

Packing group (ADR) : I  
Packing group (IMDG) : I  
Packing group (IATA) : Not applicable  
Packing group (ADN) : I  
Packing group (RID) : I

### 14.5. Environmental hazards

Dangerous for the environment : No  
Marine pollutant : No  
Other information : No supplementary information available

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### 14.6. Special precautions for user

#### - Overland transport

Classification code (ADR)	: TC3
Special provisions (ADR)	: 354
Limited quantities (ADR)	: 0
Excepted quantities (ADR)	: E0
Packing instructions (ADR)	: P602
Special packing provisions (ADR)	: B4
Mixed packing provisions (ADR)	: MP8, MP17
Portable tank and bulk container instructions (ADR)	: T20
Portable tank and bulk container special provisions (ADR)	: TP2, TP37
Tank code (ADR)	: L10CH
Tank special provisions (ADR)	: TU14, TU15, TE19, TE21
Vehicle for tank carriage	: AT
Transport category (ADR)	: 1
Special provisions for carriage - Loading, unloading and handling (ADR)	: CV1, CV13, CV28
Special provisions for carriage - Operation (ADR)	: S9, S14
Hazard identification number (Kemler No.)	: X668
Orange plates	:

**X668**

**1838**

Tunnel restriction code (ADR)	: C/D
EAC code	: 4WE
APP code	: B

#### - Transport by sea

Special provisions (IMDG)	: 354
Limited quantities (IMDG)	: 0
Excepted quantities (IMDG)	: E0
Packing instructions (IMDG)	: P602
Tank instructions (IMDG)	: T20
Tank special provisions (IMDG)	: TP2, TP13, TP37
EmS-No. (Fire)	: F-A
EmS-No. (Spillage)	: S-B
Stowage category (IMDG)	: D
Stowage and handling (IMDG)	: SW2
Properties and observations (IMDG)	: Colourless liquid. Reacts violently with water, evolving hydrogen chloride, an irritating and corrosive gas apparent as white fumes. In the presence of moisture, highly corrosive to most metals. Highly toxic if swallowed, by skin contact or by inhalation. Causes burns to skin, eyes and mucous membranes.

#### - Air transport

PCA Limited quantities (IATA)	: Forbidden
PCA limited quantity max net quantity (IATA)	: Forbidden
PCA packing instructions (IATA)	: Forbidden
PCA max net quantity (IATA)	: Forbidden
CAO packing instructions (IATA)	: Forbidden
CAO max net quantity (IATA)	: Forbidden
Special provisions (IATA)	: A2
ERG code (IATA)	: 6C

#### - Inland waterway transport

Classification code (ADN)	: TC3
Special provisions (ADN)	: 354
Limited quantities (ADN)	: 0
Excepted quantities (ADN)	: E0

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Equipment required (ADN) : PP, EP, TOX, A  
Ventilation (ADN) : VE02  
Number of blue cones/lights (ADN) : 2

### - Rail transport

Classification code (RID) : TC3  
Special provisions (RID) : 354  
Limited quantities (RID) : 0  
Excepted quantities (RID) : E0  
Packing instructions (RID) : P602  
Mixed packing provisions (RID) : MP8, MP17  
Portable tank and bulk container instructions (RID) : T20  
Portable tank and bulk container special provisions (RID) : TP2, TP37  
Tank codes for RID tanks (RID) : L10CH  
Special provisions for RID tanks (RID) : TU14, TU15, TU38, TE21, TE22  
Transport category (RID) : 1  
Special provisions for carriage - Loading, unloading and handling (RID) : CW13, CW28, CW31  
Hazard identification number (RID) : X668

### 14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

## SECTION 15: Regulatory information

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

#### 15.1.1. EU-Regulations

No REACH Annex XVII restrictions

TITANIUM TETRACHLORIDE, 99% is not on the REACH Candidate List

TITANIUM TETRACHLORIDE, 99% is not on the REACH Annex XIV List

TITANIUM TETRACHLORIDE, 99% is not subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals.

TITANIUM TETRACHLORIDE, 99% is not subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

% Volatiles : 100 %

#### 15.1.2. National regulations

##### Germany

Reference to AwSV : Water hazard class (WGK) 1, Slightly hazardous to water (Classification according to VwVwS, Annex 3; ID No. 2285)

12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

##### Netherlands

SZW-lijst van kankerverwekkende stoffen : The substance is not listed

SZW-lijst van mutagene stoffen : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : The substance is not listed

##### Denmark

Danish National Regulations : Young people below the age of 18 years are not allowed to use the product

### 15.2. Chemical safety assessment

No additional information available

## SECTION 16: Other information



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### Abbreviations and acronyms:

Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development; GHS: The Globally Harmonized System of Classification and Labelling; APF: Assigned Protection Factor

### Other information

: Prepared by safety and environmental affairs.

### Full text of H- and EUH-statements:

Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Skin Corr. 1B	Skin corrosion/irritation, Category 1B
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
EUH014	Reacts violently with water.

### SDS EU (REACH Annex II) - Custom

*The information contained in this document has been gathered from reference materials and/or Gelest, Inc. test data and is to the best knowledge and belief of Gelest, Inc. accurate and reliable. Such information is offered solely for your consideration, investigation and verification. It is not suggested or guaranteed that the hazard precautions or procedures described are the only ones which exist. Gelest, Inc. makes no warranties, express or implied, with respect to the use of such information and assumes no responsibility therefore. Information on this safety data sheet is not intended to constitute a basis for product specifications.*

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