

SAFETY DATA SHEET

Preparation Date: 2/28/2017

Revision date 8/1/2019

Revision Number: G2

1. IDENTIFICATION

Product identifier

Product code: TH138
Product Name: THIONYL CHLORIDE, PURIFIED

Other means of identification

Synonyms: Sulfinyl chloride
 Sulfur chloride oxide (Cl₂SO)
 Sulfur oxychloride
 Sulfurous dichloride
 Sulfurous oxychloride
 Thionyl dichloride

CAS #: 7719-09-7
RTECS # XM515000
Cl#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: For making acyl chlorides; Chemical intermediate for pharmaceuticals and dyes; agent to prepare organic chlorine compounds, for dehydration of organic compound; chemical intermediate for insecticide, endosulfan, for surface-active agents; chemical catalyst; manufacture of methylphosphonic dichloride, a key precursor for the nerve gas; Solvent in high energy lithium batteries; Used as a dehydrating agent to produce sulfonic anhydrides; Metallic coatings; plating from nonaqueous solvents; Used in the conversion of acids to acid chlorides in many syntheses of herbicides and surfactants.

Uses advised against No information available

Supplier: Spectrum Chemical Mfg. Corp
 14422 South San Pedro St.
 Gardena, CA 90248
 (310) 516-8000

Order Online At: <https://www.spectrumchemical.com>
Emergency telephone number Chemtrec 1-800-424-9300
Contact Person: Tom Tyner (USA - West Coast)
Contact Person: Ibad Tirmiz (USA - East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Acute toxicity - Oral	Category 4
Acute toxicity - Inhalation (Gases)	Category 3
Skin corrosion/irritation	Category 1 Sub-category A

Label elements**Danger****Hazard statements**

Harmful if swallowed

Toxic if inhaled

Causes severe skin burns and eye damage

**Hazards not otherwise classified (HNOC)**

Not Applicable

Other hazards

Not available

Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling

Do not eat, drink or smoke when using this product

Use only outdoors or in a well-ventilated area

Do not breathe dust/fume/gas/mist/vapors/spray

Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response*Immediately call a POISON CENTER or physician*

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Immediately call a POISON CENTER or physician.

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water

Wash contaminated clothing before reuse

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician.

IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell

Rinse mouth

Do NOT induce vomiting

Precautionary Statements - Storage

Store locked up

Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal

Dispose of contents and container to an approved waste disposal plant in accordance with local, regional, national and international regulations as applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS No	Weight-%
Thionyl Chloride	7719-09-7	100

4. FIRST AID MEASURES

First aid measures

- General Advice:** National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call 1-800-222-1222. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. First aider needs to protect himself.
- Skin Contact:** Wash off immediately with soap and plenty of water. Remove all contaminated clothes and shoes. Continue flushing with plenty of water for at least 15 minutes. Immediate medical attention is required. Call a physician or poison control center immediately.
- Eye Contact:** Flush eyes with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.
- Inhalation:** Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. **WARNING!** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.
- Ingestion:** Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Immediate medical attention is required. Call a physician or Poison Control Center immediately.

Most important symptoms and effects, both acute and delayed

- Symptoms**
- Severe skin and eye irritation or burns
 - May cause severe and permanent damage to the digestive tract
 - Causes serious gastrointestinal tract irritation or burns
 - Irritating to respiratory system
 - Causes chemical burns to the respiratory tract
 - May cause build-up of fluid in the lungs (pulmonary edema)
 - May cause bronchiolitis Obliterans (obstruction and inflammation of the bronchioles)
 - May cause coughing and shortness of breath

Indication of any immediate medical attention and special treatment needed

- Notes to Physician:** Treat symptomatically.

Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

- Suitable Extinguishing Media:** The product is not flammable. The product itself does not burn. If it is involved in a fire, use dry chemical, dry sand or carbon dioxide.
- Unsuitable Extinguishing Media:** No information available.

Specific hazards arising from the chemical

Hazardous combustion products

If it is involved in a fire the following can be released:
Sulfur oxides. hydrogen chloride gas.

Specific hazards

It will explode in the presence of several chemicals:
Azidoacetyl acid, Chloryl perchlorate,
N,N-Dimethylformamide, Dimethyl sulfoxide and acyl
halides, Hexafluoropropylideneaminolithium, Linseed oil +
quinoline, o-Nitrobenzoylacetic acid, p-Nitrobenzoyl and
cold ammonia solution, o-Nitrophenylacetic acid; Sodium
hydroxide, Sulfur dioxide, Toluene + ethanol+ water,
water.

Special Protective Actions for Firefighters

Specific Methods:

No information available

Special Protective Equipment for Firefighters:

As in any fire, wear self-contained breathing apparatus
pressure-demand, MSHA/NIOSH (approved or equivalent)
and full protective gear

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions:

Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not get water inside containers. Remove all sources of ignition.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment

Stop leak if you can do it without risk. Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container.

Methods for cleaning up

Use appropriate tools to put the spilled material in a suitable chemical waste disposal container. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions:

Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. Keep away from incompatible materials.

Safe Handling Advice:

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not breathe vapors or spray mist. Do not ingest. Never add water to this product. Protect from moisture. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:

Moisture sensitive. Keep container tightly closed in a dry and well-ventilated place. Protect from moisture. Store at room temperature in the original container. Store away from incompatible materials.

Incompatible Materials:

- Water
- Alkalis
- Acids
- Alcohols
- Ammonia
- Dimethyl sulfoxide

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

Component	CAS No	OSHA	NIOSH	ACGIH	AIHA WEEL
Thionyl Chloride	7719-09-7	None	1 ppm Ceiling 5 mg/m ³ Ceiling	0.2 ppm Ceiling	None

Canada

Component	CAS No	Canada - Alberta	Canada - British Columbia	Canada - Ontario	Canada - Quebec
Thionyl Chloride	7719-09-7	1 ppm Ceiling 4.9 mg/m ³ Ceiling	1 ppm Ceiling	0.2 ppm Ceiling	1 ppm Ceiling 4.9 mg/m ³ Ceiling

Australia and Mexico

Component	CAS No	Australia	Mexico
Thionyl Chloride	7719-09-7	None	None

Appropriate engineering controls

Engineering measures to reduce exposure:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

- Eye protection:** Face-shield. and Goggles
- Skin and body protection:** Chemical resistant protective suit
Gloves
Boots
- Respiratory protection:** Vapor respirator. Be sure to use an approved/certified respirator or equivalent.
- Hygiene measures:** Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid	Appearance: Fuming.	Color: Colorless to pale yellow. Reddish.
Odor: Suffocating. Sulfur dioxide odor.	Taste No information available.	Formula SOCl ₂
Molecular/Formula weight (g/mole): 118.98	Flammability (solid, gas) no data available	Flashpoint (°C/°F): No information available
Flash Point Tested according to: Not available	Autoignition Temperature (°C/°F): No information available	Lower Explosion Limit (%): No information available
Upper Explosion Limit (%): No information available	Melting point/range(°C/°F): -105°C/ -157°F	Decomposition temperature(°C/°F): No information available
Boiling point/range(°C/°F): 76-79°C/ 168.8-174°F	Bulk density: No information available	Density (g/cm³): No information available
Specific gravity: 1.638	pH No information available	Vapor pressure @ 20°C (kPa): 13.3
Evaporation rate: No information available	Vapor density: 4.1	VOC content (g/L): No information available
Odor threshold (ppm): No information available	Partition coefficient (n-octanol/water): No information available	Viscosity: No information available
Miscibility: Miscible with Benzene Miscible with Chloroform Miscible with Carbon tetrachloride	Solubility: Reacts with water Insoluble in water	

10. STABILITY AND REACTIVITY

Reactivity

Thionyl chloride fumes on exposure to moist air.

In the presence of moisture/water it decomposes and liberates toxic gases of hydrogen chloride and sulfur dioxide.

Decomposes when heated above 140 deg. C forming chlorine, sulfur dioxide, sulfur monochloride, hydrogen chloride.

Thionyl chloride decomposes in acids, alcohols, alkalis.

It is also incompatible with amines, ammonia, chloryl perchlorate, dimethyl sulfoxide, hexafluoro isopropylidene amino lithium, linseed oil, quinoline, sodium, sulfinyl chloride, N,N-Dimethylformamide, metals.

It reacts with Grignard reagents to form suloxides

It will explode in the presence of several chemicals: Azidoacetyl acid, Chloryl perchlorate, N,N-Dimethylformamide, Dimethyl sulfoxide and acyl halides, Hexafluoropropylideneaminolithium, Linseed oil + quinoline, o-Nitrobenzoylacetic acid, p-Nitrobenzoyl and cold ammonia solution, o-Nitrophenylacetic acid; Sodiumhydroxide, Sulfur dioxide, Toluene + ethanol+ water, water

Chemical stability

Stability: Moisture Sensitive. Stable under recommended storage conditions.

Possibility of Hazardous Reactions: The product may undergo hazardous decomposition, condensation or polymerization, it may react violently with water to emit toxic gases or it may become self-reactive under conditions of shock or increase in temperature or pressure

Conditions to avoid: Heat. Ignition sources. Incompatible materials. Exposure to moisture. Exposure to moist air.

Incompatible Materials: Water
Alkalis

Acids
Alcohols
Ammonia
Dimethyl sulfoxide

Hazardous decomposition products: Hydrogen chloride. Sulfur oxides.

Other Information
Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:
Skin. Eyes. Inhalation. Ingestion.

Acute Toxicity

Component Information

Thionyl Chloride	
CAS No	7719-09-7

LD50/oral/rat = 270 mg/kg Oral LD50 Rat
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = 500 ppm Inhalation LC50 Rat 1 h
LC50/inhalation/mouse = No information available
Other LD50 or LC50 information = No information available

Product Information

LD50/oral/rat =
Value - Acute Toxicity = 270 mg/kg

LD50/oral/mouse =
Value - Acute Tox = No information available

LD50/dermal/rabbit
Value - Acute Toxicity = No information available

LD50/dermal/rat
VALUE - Acute Tox = No information available

LC50/inhalation/rat
VALUE-Vapor = No information available ppm
VALUE-Gas = 500 ppm (1-hr)
VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse
VALUE-Vapor = No information available

VALUE - Gas = No information available
VALUE - Dust/Mist = No information available

Symptoms

Skin Contact: Corrosive. Causes skin burns. Severe skin irritation.

Eye Contact: Corrosive. Causes eye burns. Lachrymator (substance which increases the flow of tears). May cause conjunctivitis. May cause corneal damage.

Inhalation Toxic by inhalation. Causes chemical burns to the respiratory tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Toxic exposure to fumes of Thionyl chloride reacting with water may result in delayed pulmonary response, Bronchiolitis Obliterans (inflammation and obstruction of the bronchioles), which may include symptoms include a dry cough, shortness of breath, wheezing, and feeling tired.

Ingestion Harmful if swallowed. Causes digestive or gastrointestinal tract burns. May cause permanent damage to the digestive tract.

Aspiration hazard No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity Prolonged or repeated inhalation may cause bronchitis with coughing, phlegm, and/or shortness of breath.

Sensitization: No information available.

Mutagenic Effects: No information available

Carcinogenic effects: Not considered carcinogenic.

Component	CAS No	IARC	ACGIH - Carcinogens	NTP	OSHA HCS - Carcinogens	Australia - Notifiable Carcinogenic Substances	Australia - Prohibited Carcinogenic Substances
Thionyl Chloride	7719-09-7	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

ACGIH (American Conference of Governmental Industrial Hygienists)

IARC (International Agency for Research on Cancer)

NTP (National Toxicology Program)

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

Reproductive toxicity No data is available

Reproductive Effects: No information available
Developmental Effects: No information available
Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure No information available.
STOT - repeated exposure No information available.
Target Organs: Respiratory system. Skin. Eyes.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: No data available.

Persistence and degradability: No information available

Bioaccumulative potential: No information available.

Mobility in soil No information available

Other adverse effects No information available.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:

Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:

Empty containers should be taken for local recycling, recovery or waste disposal

Component	CAS No	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Thionyl Chloride	7719-09-7	None	None	None	None

14. TRANSPORT INFORMATION

DOT

UN-No: UN1836
Proper Shipping Name: Thionyl chloride
Hazard Class 8
Subsidiary Class No information available
Packing group: I
Emergency Response Guide Number 137
Marine Pollutant No data available
DOT RQ (lbs): No information available
Special Provisions B6, B10, N34, T10, TP2, TP13
Symbol(s): No information available
Description: UN1836, THIONYL CHLORIDE, 8, I

TDG (Canada)

UN-No: UN1836
Proper Shipping Name: Thionyl chloride
Hazard Class 8
Subsidiary Risk: No information available
Packing Group: I
Marine Pollutant No Information available
Description: UN1836, THIONYL CHLORIDE, 8, I

ADR

Product code: TH138

Product name: THIONYL CHLORIDE,
PURIFIED

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UN Number UN1836
Proper Shipping Name: Thionyl chloride
Transport hazard class(es) 8
Packing group I
Subsidiary Risk: No information available
Description: UN1836, THIONYL CHLORIDE, 8, I

IMDG

UN-No: UN1836
Proper Shipping Name: Thionyl chloride
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: I
Marine Pollutant No information available
EMS: F-A
Description UN1836, THIONYL CHLORIDE, 8, I

RID

UN Number UN1836
Proper Shipping Name: Thionyl chloride
Transport hazard class(es) 8
Subsidiary Risk: No information available
Packing group I
Description: UN1836, THIONYL CHLORIDE, 8, I

ICAO (air)

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class No information available
Subsidiary Risk: No information available
Packing Group: No information available
Description: Forbidden

IATA

UN Number Not Regulated
Proper Shipping Name: No information available
Transport hazard class(es) No information available
Subsidiary Risk: No information available
Packing group No information available
Precautionary Statements - Response No information available
Special Provisions No information available
Description: Forbidden

15. REGULATORY INFORMATION

International Inventories

Component	CAS No	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	China IECSC	Australia (AICS)	EINECS-No.
Thionyl Chloride	7719-09-7	Present ACTIV E	Present KE-33794	Present	Present (1)-818	Present	Present	Present 231-748-8

U.S. Regulations

Thionyl Chloride
 Massachusetts RTK: Present

New Jersey RTK Hazardous Substance List: 1850
 New Jersey TCPA - EHS: 250lbTQ
 Pennsylvania RTK: Present
 Minnesota - Hazardous Substance List: Present
 California Directors List of Hazardous Substances: Present

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Component	CAS No	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Thionyl Chloride	7719-09-7	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Component	CAS No	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting de minimis
Thionyl Chloride	7719-09-7	None	None	None	None	None

U.S. TSCA

Component	CAS No	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Thionyl Chloride	7719-09-7	Not Applicable	Not Applicable

Canada

WHMIS 2015 - GHS Classifications

WHMIS 2015 Hazard Classification Information:

Component
 Thionyl Chloride
 7719-09-7 (100)

WHMIS 2015 Hazard Classification
 Acute toxicity - Oral - Category 3: H301 Toxic if swallowed.; Acute toxicity - Inhalation - Category 2: H330 Fatal if inhaled.; Health Hazard Not Otherwise Classified - Category 1: Causes severe damage to the respiratory tract; Skin corrosion/irritation - Category 1: H314 Causes severe skin burns and eye damage.; Serious Eye Damage/Eye Irritation - Category 1: H318 Causes serious eye damage.

Canada Hazardous Products Regulation This product has been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

DSL/NDSL

Component	CAS No	Canada (DSL)	Canada (NDSL)
Thionyl Chloride	7719-09-7	Present	Not Listed

Component	CAS No	CEPA Schedule I - Toxic Substances
Thionyl Chloride	7719-09-7	Not listed
Component	CAS No	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
Thionyl Chloride	7719-09-7	Not listed

EU Classification

EU GHS - SV - CLP 1272/2008

Component	CAS No	EU GHS - SV - CLP (1272/2008)
Thionyl Chloride	7719-09-7	Acute toxicity - Oral - Acute Tox. 4: H302 Harmful if swallowed. (Minimum classification); Acute toxicity - Inhalation - Acute Tox. 4: H332 Harmful if inhaled. (Minimum classification); Skin corrosion/irritation - Skin Corr. 1A: H314 Causes severe skin burns and eye damage.; Supplemental Hazards - EUH014 Reacts violently with water.; Supplemental Hazards - EUH029 Contact with water liberates toxic gas.016-015-00-0 Specific target organ toxicity - Single exposure - STOT SE 3: H335 May cause respiratory irritation. (C >= 1 %)016-015-00-0

EU - CLP (1272/2008)

R-phrase(s)

R14 - Reacts violently with water
R29 - Contact with water liberates toxic gas
R35 - Causes severe burns
R20/22 - Harmful by inhalation and if swallowed

S-phrase(s)

S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
S 1/2 - Keep locked up and out of the reach of children.
S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

Component	CAS No	Classification	Concentration Limits:	Safety Phrases
Thionyl Chloride	7719-09-7	R14 Xn; R20/22 R29 C; R35	10%<=C C; R35 5%<=C<10% C; R34 1%<=C<5% Xi; R36/37/38	S1/2 S26 S36/37/39 S4

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:

C - Corrosive
Xn - Harmful



16. OTHER INFORMATION

Preparation Date: 2/28/2017
Revision date 8/1/2019
Prepared by: Sonia Owen

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet