

# Vanadium trichloride oxide

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 07/28/2015 Version: 1.0

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

#### 1.1. Product identifier

Product form : Substance  
 Substance name : Vanadium trichloride oxide  
 CAS No : 7727-18-6  
 Formula : VOCl<sub>3</sub>

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

Use of the substance/mixture : Synthesis intermediate

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

MSSA S.A.S.  
 111, Rue de la Volta - Pomblière  
 SAINT-MARCEL, 73600 - France  
 T +33 (0)4 79 24 70 70 - F +33 (0)4 79 24 70 50  
[fds-msds@metauxspeciaux.fr](mailto:fds-msds@metauxspeciaux.fr)

#### 1.4. Emergency telephone number

Country	Organisation/Company	Address	Emergency number
USA	American Association of Poison Control Centers	515 King Street, Suite 510 VA 22314 Alexandria	1-800-222-1222

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

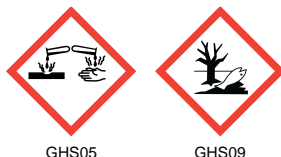
Skin Corr. 1C H314  
 Aquatic Chronic 2 H411

Full text of H-statements: see section 16

#### 2.2. Label elements

##### GHS-US labelling

Hazard pictograms (GHS-US) :



GHS05

GHS09

Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H314 - Causes severe skin burns and eye damage  
 H411 - Toxic to aquatic life with long lasting effects

Precautionary statements (GHS-US) :

P273 - Avoid release to the environment  
 P280 - Wear protective gloves/protective clothing/eye protection/face protection  
 P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower  
 P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
 P403+P233 - Store in a well-ventilated place. Keep container tightly closed

#### 2.3. Other hazards

No additional information available

#### 2.4. Unknown acute toxicity (GHS-US)

Not applicable.

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### SECTION 3: Composition/information on ingredients

#### 3.1. Substance

Name	Product identifier	%	GHS-US classification
Vanadium trichloride oxide (Main constituent)	(CAS No) 7727-18-6	>= 99,8	Skin Corr. 1C, H314 Aquatic Chronic 2, H411

Full text of H-statements: see section 16

#### 3.2. Mixture

Not applicable

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

First-aid measures general	: In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.
First-aid measures after inhalation	: Move the affected person away from the contaminated area and into the fresh air. Keep victim warm and rested. If breathing is difficult, give oxygen. Call a doctor.
First-aid measures after skin contact	: Immediately remove contaminated clothing or footwear. Rinse immediately with plenty of water. Be careful, the product may remain trapped under clothing, footwear or a wrist-watch. If skin burns appear, call a doctor immediately.
First-aid measures after eye contact	: Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum). Remove contact lenses, if present and easy to do. Continue rinsing. Consult an eye specialist immediately, even if there are no immediate symptoms.
First-aid measures after ingestion	: Do not induce vomiting. Give nothing to eat or drink. Rinse mouth out with water. Give activated charcoal. Call a physician immediately. If possible show him this sheet. Failing this, show him the packaging or label. On ingestion in large quantities : Transfer to hospital rapidly.

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

Symptoms/injuries after inhalation	: Irritation to respiratory tract.
Symptoms/injuries after skin contact	: Burns. Ulcerations. Bleeding. Bloody scabs.
Symptoms/injuries after eye contact	: Burns. Serious damage to eyes.
Symptoms/injuries after ingestion	: Corrosion or irritation of the linings of the mouth, throat, and gastrointestinal tract.

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

Treat symptomatically.

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

Suitable extinguishing media	: Carbon dioxide (CO <sub>2</sub> ). Powder.
Unsuitable extinguishing media	: Water.

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

Fire hazard	: On combustion or on thermal decomposition (pyrolysis) releases : Hydrogen chloride. Divanadium pentaoxide.
Reactivity	: Reacts violently with water. Contact with water liberates toxic gas.

#### 5.3. Advice for firefighters

Firefighting instructions	: Contain the extinguishing fluids by bunding.
Protection during firefighting	: Do not attempt to take action without suitable protective equipment : Self-contained breathing apparatus. Complete protective clothing.

### SECTION 6: Accidental release measures

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

##### 6.1.1. For non-emergency personnel

Emergency procedures	: Avoid contact with skin and eyes. Do not breathe vapours. In case of important spillage : Only qualified personnel equipped with suitable protective equipment may intervene.
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##### 6.1.2. For emergency responders

Protective equipment	: Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".
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#### 6.2. Environmental precautions

Contain the spilled material by bunding (product is hazardous for the environment). Do not discharge into drains or rivers. Notify authorities if liquid enters sewers or public waters.

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

- For containment : Liquid spill: take up in sand, earth, vermiculite.
- Methods for cleaning up : Wash contaminated area with large amounts of water. Clean preferably with a detergent - Avoid the use of solvents. Dispose of contaminated materials in accordance with current regulations.

### 6.4. Reference to other sections

For further information refer to section 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

- Precautions for safe handling : Ensure good ventilation of the work station. Avoid any direct contact with the product. Do not breathe vapours. Avoid contact of substance with water. Never open the packages under pressure. Access forbidden to unauthorised personnel. Smoking is forbidden.
- Hygiene measures : Do not drink, eat or smoke in the workplace. Always wash hands after handling the product. If on skin, take off contaminated clothing.

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

- Storage conditions : Store in dry, well-ventilated area. Keep container tightly closed. Keep away from food, drink and animal feeding stuffs.
- Incompatible materials : Water.
- Special rules on packaging : Store always product in container of same material as original container.

### 7.3. Specific end use(s)

No additional information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Vanadium trichloride oxide (7727-18-6)	
ACGIH	Not applicable
OSHA	Not applicable

### 8.2. Exposure controls

- Appropriate engineering controls : Ensure good ventilation of the work station. Extraction to remove vapours at their source. Safety shower. Eye fountain.
- Personal protective equipment : Safety glasses. Gloves. Protective clothing. Gas mask with filter type E.



- Hand protection : Chemical resistant gloves (according to European standard NF EN 374 or equivalent). Breakthrough time : refer to the recommendations of the supplier.
- Eye protection : Safety glasses with side shields conformes à a norme NF EN166. In case of increased risk : Face shield.
- Skin and body protection : If there is a risk of liquid being splashed : Chemically impervious to liquids protective clothing (type 3) according to standard NF EN14605. If there is a risk of splashes : Chemically protective clothing (type 6) according to standard NF EN13034. Boots.
- Respiratory protection : Filtering Half-face mask (DIN EN 149). Breathing apparatus with filter : P3 (EN 143) / E (EN 141). In the event of exposure to high concentrations : Gas mask with filter type : ABEK P3 (EN 136). Breathing apparatus with filter : B / E (EN 141) / P3 (EN 143).

## SECTION 9: Physical and chemical properties

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

- Physical state : Liquid
- Appearance : Fluid.
- Colour : light yellow
- Odour : chlorine
- Odour threshold : No data available
- pH : Not applicable

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Melting point	: -77 °C (101.3 kPa)
Freezing point	: No data available
Boiling point	: 127 °C (101.3 kPa)
Flash point	: Not applicable (inorganic substance)
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: No data available
Explosive limits	: No data available
Explosive properties	: Not explosive.
Oxidising properties	: Non oxidizing material according to EC criteria.
Vapour pressure	: 19,3 mm Hg (25°C)
Relative density	: 1,822 (20°C)
Relative vapour density at 20 °C	: No data available
Molecular mass	: 173,4 g/mol
Solubility	: Soluble in : Water, Ethanol, Ethers, Acetic acid.
Log Pow	: Not applicable (inorganic substance)
Log Kow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Reacts violently with water. Contact with water liberates toxic gas.

### 10.2. Chemical stability

Stable at ambient temperature and under normal conditions of use.

### 10.3. Possibility of hazardous reactions

Reacts violently with water. Exothermic reaction with water.

### 10.4. Conditions to avoid

Moisture. Air contact.

### 10.5. Incompatible materials

Water. Alkali metals. Strong oxidizing agents.

### 10.6. Hazardous decomposition products

On combustion or on thermal decomposition (pyrolysis) releases : Hydrogen chloride, Divanadium pentoxide.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity	: Not classified
Skin corrosion/irritation	: Causes severe skin burns and eye damage. pH: Not applicable
Serious eye damage/irritation	: Not classified pH: Not applicable
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified

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Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified
Symptoms/injuries after inhalation	: Irritation to respiratory tract.
Symptoms/injuries after skin contact	: Burns. Ulcerations. Bleeding. Bloody scabs.
Symptoms/injuries after eye contact	: Burns. Serious damage to eyes.
Symptoms/injuries after ingestion	: Corrosion or irritation of the linings of the mouth, throat, and gastrointestinal tract.

### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general : Toxic to aquatic life with long lasting effects.

Vanadium trichloride oxide (7727-18-6)	
LC50 fish	4 mg/l/96h (Danio rerio) (EU C1)(Published data)
EC50 Daphnia	3,5 mg/l/48h (Daphnia magna) (EU C2) (Published data)
ErC50 (algae)	9,5 mg/l/72h (Pseudokirchnerella subcapitata) (OECD 201)
NOEC chronic fish	0,17 mg/l/ 28 d (Jordanella floridae) (Published data)
NOEC chronic crustacea	0,56 mg/l (Daphnia magna, 14 weeks) (Published data)
Additional ecotoxicological information	(Vanadium)

#### 12.2. Persistence and degradability

Vanadium trichloride oxide (7727-18-6)	
Persistence and degradability	Hydrolysis : Instantaneous decomposition in the presence of moisture in the air.
Biodegradation	Not applicable (inorganic substance)

#### 12.3. Bioaccumulative potential

Vanadium trichloride oxide (7727-18-6)	
BCF	13 (28 days, OECD 305) (Published data)
Log Pow	Not applicable (inorganic substance)
Bioaccumulative potential	Not bioaccumulative.

#### 12.4. Mobility in soil

Vanadium trichloride oxide (7727-18-6)	
Ecology - soil	The product is not mobile in soil.

#### 12.5. Other adverse effects

No additional information available

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

Waste treatment methods	: Dispose of in accordance with relevant local regulations. Destroy at an authorised site.
Additional information	: Empty the packaging completely prior to disposal. The user's attention is drawn to the possible existence of specific european, national or local regulations regarding disposal.

### SECTION 14: Transport information

#### Department of Transportation (DOT)

In accordance with DOT	
Transport document description	: UN2443 Vanadium oxytrichloride, 8, II
UN-No.(DOT)	: UN2443
Proper Shipping Name (DOT)	: Vanadium oxytrichloride
Transport hazard class(es) (DOT)	: 8 - Class 8 - Corrosive material 49 CFR 173.136

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Hazard labels (DOT) : 8 - Corrosive



Packing group (DOT) : II - Medium Danger

Dangerous for the environment : Yes

Marine pollutant : Yes



DOT Packaging Non Bulk (49 CFR 173.xxx) : 202

DOT Packaging Bulk (49 CFR 173.xxx) : 242

DOT Special Provisions (49 CFR 172.102) : A3 - For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with absorbent material in tightly closed metal receptacles before packing in outer packagings.  
A6 - For combination packagings, if plastic inner packagings are used, they must be packed in tightly closed metal receptacles before packing in outer packagings.  
A7 - Steel packagings must be corrosion-resistant or have protection against corrosion.  
B2 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks are not authorized.  
B16 - The lading must be completely covered with nitrogen, inert gas or other inert materials.  
IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized.  
N34 - Aluminum construction materials are not authorized for any part of a packaging which is normally in contact with the hazardous material.  
T7 - 4 178.274(d)(2) Normal..... 178.275(d)(3)  
TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where:  $t_r$  is the maximum mean bulk temperature during transport,  $t_f$  is the temperature in degrees celsius of the liquid during filling, and  $a$  is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling ( $t_f$ ) and the maximum mean bulk temperature during transportation ( $t_r$ ) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where:  $d_{15}$  and  $d_{50}$  are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively.

DOT Packaging Exceptions (49 CFR 173.xxx) : 154

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : Forbidden

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 30 L

DOT Vessel Stowage Location : C - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel.

DOT Vessel Stowage Other : 40 - Stow "clear of living quarters"

### Additional information

Other information : Dangerous for the environment.

### ADR

Transport document description : UN 2443 VANADIUM OXYTRICHLORIDE, 8, II, (E)

Packing group (ADR) : II

Class (ADR) : 8 - Corrosive substances

Hazard identification number (Kemler No.) : 80

Classification code (ADR) : C1

Danger labels (ADR) : 8 - Corrosive substances



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Orange plates : 

<b>80</b>
<b>2443</b>

Tunnel restriction code (ADR) : E  
Limited quantities (ADR) : 1I  
Excepted quantities (ADR) : E2

### Transport by sea

UN-No. (IMDG) : 2443  
Proper Shipping Name (IMDG) : VANADIUM OXYTRICHLORIDE  
Class (IMDG) : 8 - Corrosive substances  
Packing group (IMDG) : II - substances presenting medium danger  
MFAG-No : 137

### Air transport

UN-No. (IATA) : 2443  
Proper Shipping Name (IATA) : Vanadium oxytrichloride  
Class (IATA) : 8 - Corrosives  
Packing group (IATA) : II - Medium Danger

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### Vanadium trichloride oxide (7727-18-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2. International regulations

#### CANADA

#### Vanadium trichloride oxide (7727-18-6)

Listed on the Canadian DSL (Domestic Substances List)

#### EU-Regulations

#### Vanadium trichloride oxide (7727-18-6)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

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

Skin Corr. 1C H314  
Aquatic Chronic 2 H411  
Full text of H-statements: see section 16

### National regulations

#### Vanadium trichloride oxide (7727-18-6)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
Japanese Poisonous and Deleterious Substances Control Law  
Japanese Pollutant Release and Transfer Register Law (PRTR Law)  
Listed on the Canadian IDL (Ingredient Disclosure List)

### 15.3. US State regulations

#### Vanadium trichloride oxide (7727-18-6)

Not listed on the California Proposition 65 list

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### SECTION 16: Other information

#### Abbreviations and acronyms

: ADR - RID : Agreement on the transport of dangerous goods by road - Regulations on the international transport of dangerous goods by rail. IMDG : International Maritime Dangerous Goods. IATA : International Air Transport Association. ICAO : International Civil Aviation Organisation. Wassergefährdungsklasse (Water Hazard Class).

#### Other information

: Safety data sheet established by : LISAM SERVICES - TELEGIS  
17, Rue de la Couture F-60400 PASSEL  
Safety Made Easy with [www.lisam.com](http://www.lisam.com).

#### Full text of H-statements:

Aquatic Chronic 2	Hazardous to the aquatic environment — Chronic Hazard, Category 2
Skin Corr. 1C	Skin corrosion/irritation, Category 1C
H314	Causes severe skin burns and eye damage
H411	Toxic to aquatic life with long lasting effects

#### SDS US (GHS HazCom 2012)

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*