



VANADIUM PENTOXIDE

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
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Distributed by:
Laguna Clay Company
14400 Lomitas Ave
City of Industry, CA 91746
1-800-4Laguna
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www.lagunaclay.com

SECTION 1: Identification

1.1. Identification

Product form : Substance
Trade name : VANADIUM PENTOXIDE
Chemical name : divanadium pentoxide
CAS No : 1314-62-1
Formula : V₂O₅
Other means of identification : EC# 215-239-8; Index # 023-001-00-8

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

No additional information available

1.3. Details of the supplier of the safety data sheet

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1.4. Emergency telephone number

Emergency number : 1-800-424-9300 (US, CDN, Puerto-rico) 1-703-527-3887 (international)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Acute toxicity (oral), Category 4 H302
Acute toxicity (inhalation:dust,mist) Category 4 H332
Germ cell mutagenicity, Category 2 H341
Carcinogenicity, Category 2 H351
Reproductive toxicity, Category 2 H361
Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation H335
Specific target organ toxicity — Repeated exposure, Category 1 H372
Hazardous to the aquatic environment — Chronic Hazard, Category 2 H411

Full text of H statements : see section 16

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US) :



GHS07

GHS08

GHS09

Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H302+H332 - Harmful if swallowed or if inhaled
H335 - May cause respiratory irritation

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	H341 - Suspected of causing genetic defects H351 - Suspected of causing cancer H361 - Suspected of damaging fertility or the unborn child H372 - Causes damage to organs (respiratory system) through prolonged or repeated exposure (Inhalation) H411 - Toxic to aquatic life with long lasting effects
Precautionary statements (GHS-US)	: P201 - Obtain special instructions before use P202 - Do not handle until all safety precautions have been read and understood P260 - Do not breathe vapours P261 - Avoid breathing dust, fume, gas, mist, spray, vapours P264 - Wash Skin thoroughly after handling P270 - Do not eat, drink or smoke when using this product P271 - Use only outdoors or in a well-ventilated area P273 - Avoid release to the environment P280 - Wear protective gloves, protective clothing, face protection, eye protection P301+P312 - If swallowed: Call a POISON CENTER, a doctor if you feel unwell P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing P308+P313 - If exposed or concerned: Get medical advice/attention P312 - Call a POISON CENTER, a doctor if you feel unwell P314 - Get medical advice/attention if you feel unwell P330 - Rinse mouth P391 - Collect spillage P403+P233 - Store in a well-ventilated place. Keep container tightly closed P405 - Store locked up P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Substance type : Mono-constituent

Name	Product identifier	%	GHS-US classification
VANADIUM PENTOXIDE US (Main constituent)	(CAS No) 1314-62-1	> 99	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation:dust,mist), H332 Muta. 2, H341 Carc. 2, H351 Repr. 2, H361 STOT SE 3, H335 STOT RE 1, H372 Aquatic Chronic 2, H411

Full text of classification categories and 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	: Never give anything by mouth to an unconscious person. IF exposed or concerned: Get medical advice/attention. Call a poison center or a doctor if you feel unwell.
First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
First-aid measures after skin contact	: Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.
First-aid measures after eye contact	: Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persist.
First-aid measures after ingestion	: Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention. Call a POISON CENTER or doctor/physician if you feel unwell.

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

Symptoms/injuries	: Suspected of causing genetic defects. Causes damage to organs (respiratory system) through prolonged or repeated exposure (Inhalation).
Symptoms/injuries after inhalation	: May cause respiratory irritation.

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Symptoms/injuries after ingestion : 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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.
Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Reactivity : The product is non-reactive under normal conditions of use, storage and transport.

5.3. Advice for firefighters

Firefighting instructions : Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.
Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. 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 : Ventilate spillage area. Evacuate unnecessary personnel. Do not breathe vapours.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Collect spillage.
Methods for cleaning up : Recover mechanically the product. On land, sweep or shovel into suitable containers. Minimize generation of dust. Store away from other materials. Notify authorities if product enters sewers or public waters.
Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection. For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear personal protective equipment. Provide good ventilation in process area to prevent formation of vapour.
Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up.
Incompatible products : Strong bases. Strong acids.
Incompatible materials : Sources of ignition. Direct sunlight.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

VANADIUM PENTOXIDE (1314-62-1)		
OSHA	OSHA PEL (TWA) (mg/m ³)	0.1 mg/m ³ as V ₂ O ₅ fume
OSHA	OSHA PEL (Ceiling) (mg/m ³)	0.5 mg/m ³ as V ₂ O ₅ respirable dust

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VANADIUM PENTOXIDE (1314-62-1)		
NIOSH	NIOSH REL (ceiling) (mg/m ³)	0.5 mg/m ³ 15 min, except V metal and carbide
NIOSH	Remark (NIOSH)	TLV Long-term value: 0.05 mg/m ³ as inhalable fraction

8.2. Exposure controls

Appropriate engineering controls	: Ensure good ventilation of the work station.
Personal protective equipment	: Avoid all unnecessary exposure.
Hand protection	: Wear protective gloves.
Eye protection	: tightly fitting safety goggles. Safety glasses.
Skin and body protection	: Wear suitable protective clothing.
Respiratory protection	: Wear appropriate mask. If excessive exposure exists, use only approved air-purifying or supplied air respirator operated in a positive pressure mode. Wear respiratory protection.
Environmental exposure controls	: Avoid release to the environment.
Other information	: Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Appearance	: Powder.
Colour	: dark orange
Odour	: characteristic
Odour threshold	: No data available
pH	: 2.7 Irreversible eye effects (OECD 405)
pH solution	: 0.45 (≥ 6.5) g/l
Melting point	: 656 - 690 °C
Freezing point	: Not applicable
Boiling point	: 1750 °C
Flash point	: Not applicable
Relative evaporation rate (butylacetate=1)	: No data available
Flammability (solid, gas)	: Non flammable.
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: Not applicable
Density	: 3.65 g/cm ³
Molecular mass	: 181.88 g/mol
Solubility	: Water: 0.92 g/l at 20C
Log Pow	: No data available
Auto-ignition temperature	: Not applicable
Decomposition temperature	: No data available
Viscosity, kinematic	: Not applicable
Viscosity, dynamic	: No data available
Explosive limits	: Not applicable
Explosive properties	: No data available
Oxidising properties	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

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10.2. Chemical stability

Not established.

10.3. Possibility of hazardous reactions

Not established.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

fume. Carbon monoxide. Carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed. Inhalation:dust,mist: Harmful if inhaled.

VANADIUM PENTOXIDE (1314-62-1)	
LD50 oral rat	467 mg/kg OECD 401
LD50 dermal rat	> 2500 mg/kg OECD 402
LC50 inhalation rat (mg/l)	2.21 mg/l/4h OECD 403
ATE US (oral)	467.000 mg/kg bodyweight
ATE US (vapours)	2.210 mg/l/4h
ATE US (dust,mist)	2.210 mg/l/4h

Skin corrosion/irritation : Not classified
pH: 2.7 Irreversible eye effects (OECD 405)

Serious eye damage/irritation : Not classified
pH: 2.7 Irreversible eye effects (OECD 405)

Respiratory or skin sensitisation : Not classified

Germ cell mutagenicity : Suspected of causing genetic defects.

Carcinogenicity : Suspected of causing cancer.

VANADIUM PENTOXIDE (1314-62-1)	
IARC group	2B - Possibly carcinogenic to humans

Reproductive toxicity : Suspected of damaging fertility or the unborn child.
Based on available data, the classification criteria are not met

Specific target organ toxicity (single exposure) : May cause respiratory irritation.

Specific target organ toxicity (repeated exposure) : Causes damage to organs (respiratory system) through prolonged or repeated exposure (Inhalation).

VANADIUM PENTOXIDE (1314-62-1)	
LOAEL (oral, rat, 90 days)	5.36 mg/kg bodyweight/day
LOAEL (inhalation, rat,dust/mist/fume, 90 days)	0.5 mg/l/6h/day

Aspiration hazard : Not classified

Potential adverse human health effects and symptoms : Harmful if swallowed.

Symptoms/injuries after inhalation : May cause respiratory irritation.

Symptoms/injuries after ingestion : Swallowing a small quantity of this material will result in serious health hazard.

SECTION 12: Ecological information

12.1. Toxicity

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

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

VANADIUM PENTOXIDE (1314-62-1)	
LC50 fish 1	1.24 mg/l 96 h Golden Orfe (OECD 203)

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VANADIUM PENTOXIDE (1314-62-1)	
EC50 Daphnia 1	4.27 mg/l 48 h (OECD 202)
EC50 other aquatic organisms 1	2.907 mg/l 72 h (OECD 201)
NOEC (acute)	1.51 mg/l 48h Daphnie OECD 202
NOEC (chronic)	0.56 mg/l 14 week Daphnia OECD 202

12.2. Persistence and degradability

VANADIUM PENTOXIDE (1314-62-1)	
Persistence and degradability	May cause long-term adverse effects in the environment.

12.3. Bioaccumulative potential

VANADIUM PENTOXIDE (1314-62-1)	
Bioconcentration factor (BCF REACH)	12.3 L/kg ww
Bioaccumulative potential	Not established.

12.4. Mobility in soil

VANADIUM PENTOXIDE (1314-62-1)	
Mobility in soil	2.66 log Kp = 2.66 L/kg

12.5. Other adverse effects

Other information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.
Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to ..
Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN2862 Vanadium pentoxide (non-fused form), 6.1, III

UN-No.(DOT) : UN2862

Proper Shipping Name (DOT) : Vanadium pentoxide
non-fused form

Class (DOT) : 6.1 - Class 6.1 - Poisonous materials 49 CFR 173.132

Packing group (DOT) : III - Minor Danger

Hazard labels (DOT) : 6.1 - Poison



Dangerous for the environment : Yes

Marine pollutant : Yes



DOT Packaging Non Bulk (49 CFR 173.xxx) : 213

DOT Packaging Bulk (49 CFR 173.xxx) : 240

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DOT Special Provisions (49 CFR 172.102)	: IB8 - Authorized IBCs: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2) IP3 - Flexible IBCs must be sift-proof and water-resistant or must be fitted with a sift-proof and water-resistant liner T1 - 1.5 178.274(d)(2) Normal..... 178.275(d)(2) TP33 - The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point which are cooled and transported as a solid mass. Solid substances transported or offered for transport above their melting point are authorized for transportation in portable tanks conforming to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II, unless a tank with more stringent requirements for minimum shell thickness, maximum allowable working pressure, pressure-relief devices or bottom outlets are assigned in which case the more stringent tank instruction and special provisions shall apply. Filling limits must be in accordance with portable tank special provision TP3. Solids meeting the definition of an elevated temperature material must be transported in accordance with the applicable requirements of this subchapter
DOT Packaging Exceptions (49 CFR 173.xxx)	: 153
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: 100 kg
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: 200 kg
DOT Vessel Stowage Location	: A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel
DOT Vessel Stowage Other	: 40 - Stow "clear of living quarters"
Emergency Response Guide (ERG) Number	: 151
Other information	: No supplementary information available.

TDG

Transport by sea

UN-No. (IMDG)	: 2862
Proper Shipping Name (IMDG)	: VANADIUM PENTOXIDE
Class (IMDG)	: 6.1 - Toxic substances
Packing group (IMDG)	: III - substances presenting low danger
Limited quantities (IMDG)	: 5 kg
Marine pollutant	: Yes



Air transport

UN-No. (IATA)	: 2862
Proper Shipping Name (IATA)	: Vanadium pentoxide
Class (IATA)	: 6.1 - Toxic Substances
Packing group (IATA)	: III - Minor Danger

SECTION 15: Regulatory information

15.1. US Federal regulations

VANADIUM PENTOXIDE (1314-62-1)

Listed on the United States TSCA (Toxic Substances Control Act) inventory
Subject to reporting requirements of United States SARA Section 313

CERCLA RQ	1000 lb
SARA Section 302 Threshold Planning Quantity (TPQ)	10000 lb 100lb if the substance is solid in powder form with particle size less than 100 microns, or is in solution or molten form
SARA Section 313 - Emission Reporting	100 %

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15.2. International regulations

CANADA

No additional information available

EU-Regulations

No additional information available

National regulations

VANADIUM PENTOXIDE (1314-62-1)

Listed on IARC (International Agency for Research on Cancer)

15.3. US State regulations

VANADIUM PENTOXIDE (1314-62-1)

U.S. - California - Proposition 65 - Carcinogens List	Yes
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Data sources : REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. SDS of suppliers.

Other information : None.

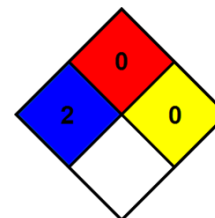
Full text of H-statements:

H302	Harmful if swallowed
H332	Harmful if inhaled
H335	May cause respiratory irritation
H341	Suspected of causing genetic defects
H351	Suspected of causing cancer
H361	Suspected of damaging fertility or the unborn child
H372	Causes damage to organs through prolonged or repeated exposure
H411	Toxic to aquatic life with long lasting effects

NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 2 Moderate Hazard - Temporary or minor injury may occur
* - Chronic (long-term) health effects may result from repeated overexposure

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

SDS US (GHS HazCom 2012)

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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