

### SECTION 1: Identification

#### 1.1. Identification

Product form	: Substance
Trade name	: VANADIUM PENTOXIDE POWDER
Chemical name	: divanadium pentaoxide; vanadium pentoxide
CAS-No.	: 1314-62-1
Product code	: 41335

#### 1.2. Recommended use and restrictions on use

#### 1.3. Supplier

CellMark USA, LLC  
 2 Corporate Drive  
 Shelton, CT 06484 - USA  
 T +1 203 541 9200 - F +1 203-541-9191  
[chemicals@cellmark.com](mailto:chemicals@cellmark.com)

#### 1.4. Emergency telephone number

Emergency number : 1-800-535-5053 (US, Canada, Puerto Rico) or 1-352-323-3500 (international)

### SECTION 2: Hazard(s) identification

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

##### GHS-US classification

Acute toxicity (oral), Category 4	H302 Harmful if swallowed.
Acute toxicity (inhal.), Category 4	H332 Harmful if inhaled.
Serious eye damage/eye irritation, Category 2A	H319 Causes serious eye irritation.
Germ cell mutagenicity, Category 2	H341 Suspected of causing genetic defects.
Carcinogenicity, Category 2	H351 Suspected of causing cancer.
Reproductive toxicity, Category 2	H361 Suspected of damaging fertility or the unborn child.
Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation	H335 May cause respiratory irritation.
Specific target organ toxicity – Repeated exposure, Category 1	H372 Causes damage to organs through prolonged or repeated exposure.
Hazardous to the aquatic environment – Chronic Hazard, Category 2	H411 Toxic to aquatic life with long lasting effects.
Combustible Dust	May form combustible dust concentrations in air

Full text of H-statements: see section 16

#### 2.2. GHS Label elements, including precautionary statements

##### GHS US labelling

Hazard pictograms (GHS US) :



Signal word (GHS US) :

Danger

Hazard statements (GHS US) :

May form combustible dust concentrations in air  
 H302+H332 - Harmful if swallowed or if inhaled  
 H319 - Causes serious eye irritation.  
 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.

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/vapours/spray.  
 P264 - Wash hands, forearms and face thoroughly after handling.

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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/eye protection/face protection.  
P301+P312 - If swallowed: Call a poison center or doctor if you feel unwell.  
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.  
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P308+P313 - If exposed or concerned: Get medical advice/attention.  
P312 - Call a poison center or doctor if you feel unwell.  
P314 - Get medical advice/attention if you feel unwell.  
P330 - Rinse mouth.  
P337+P313 - If eye irritation persists: Get medical advice/attention.  
P391 - Collect spillage.  
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.  
P405 - Store locked up.  
P501 - Dispose of contents/container ...

### 2.3. Other hazards which do not result in classification

No additional information available

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

Not applicable

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Substance type : Mono-constituent

Name	Product identifier	%	GHS-US classification
Divanadium Pentoxide Non-Fused (Main constituent)	(CAS-No.) 1314-62-1	80 – 100	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Eye Irrit. 2A, H319 Muta. 2, H341 Carc. 2, H351 Repr. 2, H361 STOT SE 3, H335 STOT RE 1, H372 Aquatic Chronic 2, H411 Comb. Dust

Full text of hazard classes and 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 : 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 a doctor if you feel unwell. Move the affected person away from the contaminated area and into the fresh air. Give oxygen or artificial respiration if necessary. If unconscious place in recovery position and seek medical advice. Unconscious: maintain adequate airway and respiration. Loosen tight clothing such as a collar, tie, belt or waistband.

First-aid measures after skin contact : Wash skin with plenty of water. Minimum flushing is for 20 minutes. Get immediate medical advice/attention. Thoroughly clean shoes before re-using.

First-aid measures after eye contact : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

First-aid measures after ingestion : Rinse mouth. Call a poison center or a doctor if you feel unwell. Remove victim to uncontaminated area. Do NOT induce vomiting unless directed to do so by medical personnel. If vomiting occurs have person lean forward. Do not give an unconscious person anything to drink. Never give anything by mouth to an unconscious person. If unconscious place in recovery position and seek medical advice. Loosen tight clothing such as a collar, tie, belt or waistband.

### 4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after inhalation : May cause respiratory irritation.

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Symptoms/effects after skin contact	: None under normal conditions. Dust may cause irritation in skin folds or by contact in combination with tight clothing.
Symptoms/effects after eye contact	: Eye irritation.
Symptoms/effects after ingestion	: Harmful if swallowed.

### 4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically. Get immediate medical advice/attention.

## SECTION 5: Fire-fighting measures

### 5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media	: Dry powder.
Unsuitable extinguishing media	: Do not use a heavy water stream.

### 5.2. Specific hazards arising from the chemical

Fire hazard	: No fire hazard.
Explosion hazard	: May form explosive dust-air mixture if dispersed.
Hazardous decomposition products in case of fire	: Toxic fumes may be released.

### 5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions	: Fight fire from safe distance and protected location. Do not enter fire area without proper protective equipment, including respiratory protection.
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

General measures	: Notify authorities if product enters sewers or public waters. Absorb spillage to prevent material damage.
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#### 6.1.1. For non-emergency personnel

Protective equipment	: Wear recommended personal protective equipment.
Emergency procedures	: Ventilate spillage area. Do not breathe vapours. Avoid contact with skin and eyes.

#### 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".
Emergency procedures	: Evacuate unnecessary personnel.

### 6.2. Environmental precautions

Avoid release to the environment. Do not allow to enter drains or water courses. Notify authorities if liquid enters sewers or public waters.

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

For containment	: Collect spillage.
Methods for cleaning up	: Mechanically recover the product. Notify authorities if product enters sewers or public waters. Minimise generation of dust. Pick-up and arrange disposal without creating dust. Do not dry sweep materials, use a vacuum with a HEPA filter or a wet mop.
Other information	: Dispose of materials or solid residues at an authorized site.

### 6.4. Reference to other sections

For further information refer to section 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Additional hazards when processed	: Keep away from open flames, hot surfaces and sources of ignition. Further processing of solid materials may result in the formation of combustible dust. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
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- 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. Do not breathe vapours. Ensure good ventilation of the work station. Avoid contact with skin and eyes. Further processing of solid materials may result in the formation of combustible dust. The potential for combustible dust formation should be taken into consideration before additional processing occurs. . Ground/bond container and receiving equipment. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Prevent the build-up of electrostatic charge. Provide local exhaust or general room ventilation. Provide adequate ventilation to minimize dust and/or vapour concentrations. In case of insufficient ventilation, wear suitable respiratory equipment.
- 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

- Technical measures : Keep in a cool, well-ventilated place away from heat.
- Storage conditions : Store locked up. Keep away from oxidizing agents. Keep container tightly closed. Keep only in the original container in a cool, well ventilated place away from : Direct sunlight, Heat sources. Containers which are opened should be properly resealed and kept upright to prevent leakage.
- Packaging materials : Store always product in container of same material as original container.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

VANADIUM PENTOXIDE POWDER (1314-62-1)	
<b>USA - ACGIH - Occupational Exposure Limits</b>	
Local name	Vanadium pentoxide, as V
ACGIH OEL TWA	0.05 mg/m <sup>3</sup> (I - Inhalable particulate matter)
Remark (ACGIH)	TLV® Basis: URT & LRT irr. Notations: A3 (Confirmed Animal Carcinogen with Unknown Relevance to Humans)
Regulatory reference	ACGIH 2024
<b>USA - OSHA - Occupational Exposure Limits</b>	
Local name	Vanadium
OSHA PEL C	0.5 mg/m <sup>3</sup> (Respirable dust (as V2O5)) 0.1 mg/m <sup>3</sup> (Fume (as V2O5))
Regulatory reference (US-OSHA)	OSHA Annotated Table Z-1

### 8.2. Appropriate engineering controls

- Appropriate engineering controls : Ensure good ventilation of the work station. Handle in accordance with good industrial hygiene and safety practice. Provide adequate ventilation to minimize dust concentrations.
- Environmental exposure controls : Avoid release to the environment.

### 8.3. Individual protection measures/Personal protective equipment

#### Personal protective equipment:

Wear recommended personal protective equipment.

#### Hand protection:

Protective gloves

#### Eye protection:

Safety glasses

#### Skin and body protection:

Wear suitable protective clothing

#### Respiratory protection:

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[In case of inadequate ventilation] wear respiratory protection. Wear an approved filter type dust respirator when handling this product. Always use an approved respirator when vapor/aerosols exceed permissible exposure limits. Where risk assessment shows air-purifying respirators are appropriate use a half-mask respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Follow OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149.

### Personal protective equipment symbol(s):



## SECTION 9: Physical and chemical properties

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

Physical state	: Solid
Appearance	: Powder. Granular solid. flakes.
Colour	: Pale yellow to brown
Odour	: characteristic
Odour threshold	: No data available
pH	: 2.7 CONC.(%W/W): 1%
Melting point	: 671 °C Source: ECHA
Freezing point	: Not applicable
Boiling point	: 1750 °C Source: ECHA
Flash point	: Not applicable
Relative evaporation rate (butylacetate=1)	: No data available
Flammability	: Non flammable.
Vapour pressure	: No data available
Relative vapour density at 20°C	: No data available
Relative density	: 3.65 Source: ECHA
Density	: 3.65 g/cm <sup>3</sup> Type: 'density' Temp.: 21,7 °C
Molecular mass	: 181.879 g/mol Source: ChemIDPlus
Solubility	: Water: 0.92 g/l at 20°C Source: ECHA
Partition coefficient n-octanol/water (Log Pow)	: No data available
Auto-ignition temperature	: Not applicable
Decomposition temperature	: 1750 °C
No data availableViscosity, 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.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

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### 10.4. Conditions to avoid

Avoid creating or spreading dust. Avoid dust clouds in combination with static electricity.

### 10.5. Incompatible materials

No additional information available

### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity (oral) : Harmful if swallowed.  
Acute toxicity (dermal) : Not classified  
Acute toxicity (inhalation) : Harmful if inhaled.

VANADIUM PENTOXIDE POWDER (1314-62-1)	
LD50 oral rat	221.1 mg/kg Source: ECHA
LD50 dermal rat	> 2500 mg/kg bodyweight Animal: rat, Animal sex: male, Guideline: OECD Guideline 402 (Acute Dermal Toxicity)
ATE US (oral)	221.1 mg/kg bodyweight
ATE US (gases)	4500 ppmv/4h
ATE US (vapours)	4.29 mg/l/4h
ATE US (dust,mist)	1.5 mg/l/4h

Skin corrosion/irritation : Not classified  
pH: 2.7 CONC.(%W/W): 1%  
Serious eye damage/irritation : Causes serious eye irritation.  
pH: 2.7 CONC.(%W/W): 1%  
Respiratory or skin sensitisation : Not classified  
Germ cell mutagenicity : Suspected of causing genetic defects.  
Carcinogenicity : Suspected of causing cancer.

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

Reproductive toxicity : Suspected of damaging fertility or the unborn child.  
STOT-single exposure : May cause respiratory irritation.  
STOT-repeated exposure : Causes damage to organs through prolonged or repeated exposure.

VANADIUM PENTOXIDE POWDER (1314-62-1)	
NOAEL (oral, rat, 90 days)	16.9 mg/kg bodyweight Animal: rat, Animal sex: male

Aspiration hazard : Not classified  
Viscosity, kinematic : Not applicable  
Symptoms/effects after inhalation : May cause respiratory irritation.  
Symptoms/effects after skin contact : None under normal conditions. Dust may cause irritation in skin folds or by contact in combination with tight clothing.  
Symptoms/effects after eye contact : Eye irritation.  
Symptoms/effects after ingestion : Harmful if swallowed.

## SECTION 12: Ecological information

### 12.1. Toxicity

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

VANADIUM PENTOXIDE POWDER (1314-62-1)	
LC50 - Fish [1]	0.693 mg/l Source: ECHA

### 12.2. Persistence and degradability

No additional information available

### 12.3. Bioaccumulative potential

No additional information available

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### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

No additional information available

## SECTION 13: Disposal considerations

### 13.1. Disposal methods

- Regional waste regulation : Disposal must be done according to official regulations.
- Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions. Dispose in a safe manner in accordance with local/national regulations.
- Sewage disposal recommendations : Disposal must be done according to official regulations.
- Product/Packaging disposal recommendations : Comply with applicable regulations for solid waste disposal. Disposal must be done according to official regulations.
- Additional information : Do not re-use empty containers.

## SECTION 14: Transport information

### Department of Transportation (DOT)

In accordance with DOT

- Transport document description (DOT) : UN2862 Vanadium pentoxide, 6.1, III
- UN-No.(DOT) : UN2862
- Proper Shipping Name (DOT) : Vanadium pentoxide
- 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
- 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

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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.

### Transportation of Dangerous Goods

Transport document description (TDG)	: UN2862 VANADIUM PENTOXIDE, 6.1, III
UN-No. (TDG)	: UN2862
Proper Shipping Name (TDG)	: VANADIUM PENTOXIDE
TDG Primary Hazard Classes	: 6.1 - Class 6.1 - Toxic Substances
Packing group (TDG)	: III - Minor Danger
Explosive Limit and Limited Quantity Index	: 5 kg
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index	: 100 kg

### Transport by sea

Transport document description (IMDG)	: UN 2862 VANADIUM PENTOXIDE, 6.1, III, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS
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

Transport document description (IATA)	: UN 2862 Vanadium pentoxide, 6.1, III, ENVIRONMENTALLY HAZARDOUS
UN-No. (IATA)	: 2862
Proper Shipping Name (IATA)	: Vanadium pentoxide
Class (IATA)	: 6.1 - Toxic Substances
Packing group (IATA)	: III - Low danger

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

No additional information available

### 15.2. International regulations

#### CANADA

No additional information available

#### EU-Regulations

Not listed on REACH Annex XVII

Not listed on the REACH Candidate List

Not listed on REACH Annex XIV (Authorisation List)

Not listed on the PIC list (Regulation EU 649/2012)

Not listed on the POP list (Regulation EU 2019/1021)

#### National regulations

No additional information available



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### 15.3. US State regulations

#### California Proposition 65

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

### SECTION 16: Other information

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Full text of H-statements:

H302	Harmful if swallowed.
H319	Causes serious eye irritation.
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.

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.*