SAFETY DATA SHEET

MATERION

Version #: 02
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SECTION 1: Identification of the substance/mixture and of the company/undertaking

Registration number -

Synonyms divanadiumpentaoxid * VANADIUM FUME (V2O5) * vanadium oxide * Vanadin(V) oxide * VANADIUM PENTOXIDE

Materion Code 2DD

1.1. Product identifier

Name of the substance Vanadium oxide (V2O5) powder and pieces

Identification number 023-001-00-8 (Index number)

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

Identified uses Not available.

Uses advised against None known.

1.3. Details of the supplier of the safety data sheet

Supplier

Company name Materion Electronic Materials

Address 6070 Parkland Blvd
Mayfield Heights, OH 44124
United States

Division

Telephone 1.216.383.4019

e-mail Materion-PS@materion.com

Contact person Product Stewardship Director

1.4. Emergency telephone number

Document number 2DD

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classificatior applies.

Classification according to Regulation (EC) No 1272/2008 as amended

Health hazards

Acute toxicity, oral	Category 3	
Acute toxicity, dermal	Category 4	
Acute toxicity, inhalation	Category 2	
Germ cell mutagenicity	Category 2	H341 - Suspected of causing genetic defects.
Carcinogenicity	Category 1B	
Reproductive toxicity (fertility, the unborn child)	Category 2	H361 - Suspected of damaging fertility or the unborn child.
Reproductive toxicity	Effects on or via lactation	
Specific target organ toxicity - single exposure	Category 3 respiratory tract irritation	H335 - May cause respiratory irritation.
Specific target organ toxicity - repeated exposure	Category 1 (Respiratory tract)	H372 - Causes damage to organs through prolonged or repeated exposure.

Environmental hazards

Hazardous to the aquatic environment, acute aquatic hazard	Category 1

Hazardous to the aquatic environment, long-term aquatic hazard	Category 2	H411 - Toxic to aquatic life with long lasting effects.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains: divanadium pentaoxide; vanadium pentoxide

Hazard pictograms

Signal word Danger

Hazard statements

H302 + H312 + H332	Harmful if swallowed, in contact with skin or if inhaled.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H361	Suspected of damaging fertility or the unborn child.
H341	Suspected of causing genetic defects.
H372	Causes damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/fume.
P264	Wash 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/eye protection/face protection.

Response

P308 + P313	IF exposed or concerned: Get medical advice/attention.
P301 + P312	IF SWALLOWED: Call a POISON CENTRE/doctor if you feel unwell.
P330	Rinse mouth.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312	Call a POISON CENTRE/doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTRE or doctor/physician.
P308 + P313	If exposed or concerned: Get medical advice/attention.
P391	Collect spillage.

Storage

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Disposal

P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

Supplemental label information None.

2.3. Other hazards None known.

SECTION 3: Composition/information on ingredients

3.1. Substances

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
divanadium pentaoxide; vanadium pentoxide	100	1314-62-1 215-239-8	-	023-001-00-8	
Classification: Eye Irrit. 2;H319, Muta. 2;H341, Repr. 2;H361, STOT SE 3;H335, STOT RE 1;H372, Aquatic Chronic 2;H411					

List of abbreviations and symbols that may be used above

CLP: Regulation No. 1272/2008.
DSD: Directive 67/548/EEC.
M: M-factor
vPvB: very persistent and very bioaccumulative substance.
PBT: persistent, bioaccumulative and toxic substance.
#: This substance has been assigned Community workplace exposure limit(s).

Composition comments The full text for all R- and H-phrases is displayed in section 16.

SECTION 4: First aid measures

General information Get medical attention. Show this safety data sheet to the doctor in attendance.

4.1. Description of first aid measures

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Perform artificial respiration if breathing has stopped. Call a physician or poison control centre immediately.

Skin contact Wash skin thoroughly with soap and water for several minutes. Get medical attention immediately.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

Ingestion Never give anything by mouth to an unconscious person. Rinse mouth thoroughly. Call a physician or poison control centre immediately.

4.2. Most important symptoms and effects, both acute and delayed Prolonged exposure may cause chronic effects. Severe eye irritation. Dusts may irritate the respiratory tract, skin and eyes. Coughing. Oedema. Proteinuria. Jaundice. Liver enlargement.

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

SECTION 5: Firefighting measures

General fire hazards No unusual fire or explosion hazards noted.

5.1. Extinguishing media

Suitable extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Not available.

5.2. Special hazards arising from the substance or mixture Not available.

5.3. Advice for firefighters

Special protective equipment for firefighters Wear self-contained breathing apparatus and protective clothing.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel Wear appropriate personal protective equipment.

For emergency responders Keep unnecessary personnel away.

6.2. Environmental precautions Avoid release to the environment.

6.3. Methods and material for containment and cleaning up Collect dust using a vacuum cleaner equipped with HEPA filter. Sweep up or vacuum up spillage and collect in suitable container for disposal.

6.4. Reference to other sections Not available.

SECTION 7: Handling and storage

7.1. Precautions for safe handling Avoid contact with eyes and prolonged skin contact. Avoid formation of dusts and aerosols. Wear appropriate personal protective equipment. Wash hands thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities Store locked up. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place.

7.3. Specific end use(s) Not available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

Austria. MAK List, OEL Ordinance (GwV), BGBl. II, no. 184/2001, as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	MAK	0,05 mg/m3	Respirable dust.
	STEL	0,25 mg/m3	Respirable dust.

Belgium. OEL. Exposure Limit Values to Chemical Substances at Work, Code of Well-being at work, Book VI, Title 1 - Chemical agents, as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,03 mg/m3	
		0,005 mg/m3	Respirable fraction.

Bulgaria. OELs. Ordinance No 13 on protection of workers against risks of exposure to chemical agents at work, as amended

Material	Type	Value
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,05 mg/m3

Croatia. OELs (GVI). Regulation on Protection of Workers against Exposure to Dangerous Chemicals at Work, OELs and Biological Limit Values, Annex I (NN 91/2018), as amended

Material	Type	Value
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	MAC	0,05 mg/m3

Cyprus. OELs. Control of factory atmosphere and dangerous substances in factories regulation, PI 311/73, as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,5 mg/m3	Dust.
		0,1 mg/m3	
		0,05 mg/m3	Fume.

Czech Republic. Occupational exposure limit values of chemicals at work (Decree on protection of health at work, 361/2007, Annex 2, Part A & Annex 3, Part A, as amended)

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	Ceiling	0,1 mg/m3	Dust and fume.
	TWA	0,05 mg/m3	Dust and fume.

Denmark. Work Environment Authority. Exposure Limits for Substances & Materials, Annex 2

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TLV	0,03 mg/m3	Dust and fume.

Estonia. OELs. Occupational Exposure Limits of Hazardous Substances (Regulation No. 105/2001, Annex), as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	STEL	0,05 mg/m3	Fine dust.
	TWA	0,2 mg/m3	Total dust.

Finland. HTP-arvot, App 3., Binding Limit Values, Social Affairs and Ministry of Health

Material	Type	Value
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,02 mg/m3

France. Threshold Limit Values (VLEP) for Occupational Exposure to Chemicals in France, INRS ED 984

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	VME	0,05 mg/m3	Dust and fume.

Regulatory status: Indicative limit (VL)

Germany. TRGS 900, Limit Values in the Ambient Air at the Workplace

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	AGW	0,03 mg/m3	Inhalable fraction.
		0,005 mg/m3	Respirable fraction.

Greece. OELs, Presidential Decree No. 307/1986, as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,5 mg/m3	Respirable dust.
		0,05 mg/m3	Inhalable dust.

Hungary. OELs. Decree on protection of workers exposed to chemical agents (5/2020. (II.6)), Annex 1&2, as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	STEL	0,2 mg/m3	Respirable.
	TWA	0,05 mg/m3	Respirable.

Iceland. OELs. Regulation 390/2009 on Pollution Limits and Measures to Reduce Pollution at the Workplace, as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,2 mg/m3	Dust and fume.

Ireland. OELVs, Schedules 1 & 2, Code of Practice for Chemical Agents and Carcinogens Regulations

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,05 mg/m3	Total inhalable fraction

Italy. OELs (Legislative Decree n.81, 9 April 2008), as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,05 mg/m3	Inhalable fraction.

Latvia. OELs. Occupational Exposure Limits of Chemical Substances at Workplace (Reg. No. 325/ 2007, L.V. 80, Annex 1), as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,1 mg/m3	Decomposition aerosol.

Lithuania. OELs. Occupational Exposure Limit Values for Chemical Substances (Hygiene Norm HN 23:2011; Order No. V-824/A1-389), as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	Ceiling	0,05 mg/m3	Respirable fraction.
	TWA	0,2 mg/m3	Inhalable fraction.

Netherlands. OELs per Annex XIII of Working Conditions Regulation (Staatscourant no. 252, 29 December 2006), as amended

Material	Type	Value
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	STEL	0,03 mg/m3
	TWA	0,01 mg/m3

Poland. Maximum permissible concentrations and intensities of harmful factors in the work environment (Dz.U.Poz. 1286/2018, Annex 1)

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,05 mg/m3	Inhalable fraction.

Portugal. VLEs. Norm on occupational exposure to chemical agents (NP 1796-2014)

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,05 mg/m3	Inhalable fraction.

Romania. OELs. Limit Values of Chemical Agents at Workplace (Regulation 1.218/2006, M.O 845, Annex 1, 3&4, as amended)

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	STEL	0,1 mg/m3	Fume.
	TWA	0,1 mg/m3	Dust.
		0,05 mg/m3	Fume.

Slovakia. OELs. Maximum permissible exposure limits for chemical factors in workplace air (Regulation No 355/2006, Annex 1, Table 1, as amended)

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,2 mg/m3	Inhalable fraction.
		0,05 mg/m3	Respirable fraction.

Slovenia. OELs. Occupational Exposure Limits of Chemicals at Workplace (Reg. on Protection of Workers from Risks due to Exp. to Chemicals at Work, Ann. I 100/2001), as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	KTV	0,03 mg/m3	Inhalable fraction.
		0,005 mg/m3	Respirable fraction.

Slovenia. OELs. Occupational Exposure Limits of Chemicals at Workplace (Reg. on Protection of Workers from Risks due to Exp. to Chemicals at Work, Annex I), as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,03 mg/m3	Inhalable fraction.
		0,005 mg/m3	Respirable fraction.

Spain. OELs. INSST, Límites de Exposición Profesional Para Agentes Químicos, Table 1-Valores Límites Ambientales (VLAs)

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,05 mg/m3	Respirable fraction and fume.

Sweden. OELs (Annex 1). Work Environment Authority (AV), Occupational Exposure Limit Values (AFS 2018:1), as amended

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	Ceiling	0,05 mg/m3	Respirable dust.
	TWA	0,2 mg/m3	Total dust.

Switzerland. SUVA Grenzwerte am Arbeitsplatz: Aktuelle MAK-Werte

Material	Type	Value	Form
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	STEL	0,05 mg/m3	Respirable fraction.
	TWA	0,05 mg/m3	Respirable fraction.

UK. OELs. Workplace Exposure Limits (WELs) (EH40/2005 (Fourth Edition 2020)), Table 1

Material	Type	Value
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	TWA	0,05 mg/m3

Biological limit values

France. Biological indicators of exposure (IBE) (National Institute for Research and Security (INRS), ND 2065)

Material	Value	Determinant	Specimen	Sampling Time
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	0,05 mg/g	Vanadium	Creatinine in urine	*

* - For sampling details, please see the source document.

Hungary. BELs. Decree on protection of workers exposed to chemical agents (5/2020. (II.6)), Annex 3&4, as amended

Material	Value	Determinant	Specimen	Sampling Time
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	0,155 µmol/mmol	Vanadium	Creatinine in urine	*
	0,07 mg/g	Vanadium	Creatinine in urine	*

* - For sampling details, please see the source document.

Slovakia. BLVs (Biological Limit Value). Regulation no. 355/2006 concerning protection of workers exposed to chemical agents, Annex 2

Material	Value	Determinant	Specimen	Sampling Time
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	50 µg/g	Vanadium	Creatinine in urine	*

* - For sampling details, please see the source document.

Spain. BELs. INSST, Límites de Exposición Profesional Para Agentes Químicos, Table 3-Valores Límite Biológicos (VLB)

Material	Value	Determinant	Specimen	Sampling Time
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	50 µg/g	Vanadio	Creatinine in urine	*

* - For sampling details, please see the source document.

Switzerland. SUVA Grenzwerte am Arbeitsplatz: Aktuelle BAT-Werte

Material	Value	Determinant	Specimen	Sampling Time
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	70 µg/g	Vanadium	Creatinine in urine	*

* - For sampling details, please see the source document.

Recommended monitoring procedures Follow standard monitoring procedures.

Derived no effect levels (DNELs) Not available.

Predicted no effect concentrations (PNECs) Not available.

Exposure guidelines

Slovenia. OELs. Regulations concerning protection of workers against risks due to exposure to chemicals while working (Official Gazette of the Republic of Slovenia)

divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	Can be absorbed through the skin.

8.2. Exposure controls

Appropriate engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If engineering measures are not sufficient to maintain concentrations of dust particulates below the OEL (occupational exposure limit), suitable respiratory protection must be worn. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits.

Individual protection measures, such as personal protective equipment

General information Eye wash fountain is recommended. Use personal protective equipment as required.

Eye/face protection Wear safety glasses with side shields (or goggles). Face shield is recommended.

Skin protection

- Hand protection Wear appropriate chemical resistant gloves. Nitrile gloves are recommended.

- Other Full body suit and boots are recommended when handling large volumes or in emergency situations.

Respiratory protection Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

Hygiene measures Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Environmental exposure controls Contain spills and prevent releases and observe national regulations on emissions. Inform appropriate managerial or supervisory personnel of all environmental releases.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state Solid.

Form Powder.

Colour Not available.

Odour Not available.

Melting point/freezing point 690 °C (1274 °F)

Boiling point or initial boiling point and boiling range 1750 °C (3182 °F)

Flammability Not available.

Upper/lower flammability or explosive limits

Explosive limit - lower (%) Not available.

Explosive limit – upper (%) Not available.

Flash point Not available.

Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
pH	Not available.
Kinematic viscosity	Not available.
Solubility	
Solubility (water)	8 g/l
Partition coefficient (n-octanol/water) (log value)	Not available.
Vapour pressure	<0,0000001 kPa (25 °C (77 °F))
Density and/or relative density	
Density	3,65 g/cm3 estimated at 21,7 °C
Vapour density	Not available.
Particle characteristics	Not available.
9.2. Other information	
9.2.1. Information with regard to physical hazard classes	No relevant additional information available.
9.2.2. Other safety characteristics	
Molecular formula	O5-V2
Molecular weight	181,88 g/mol
Specific gravity	3,65 at 21,7 °C

SECTION 10: Stability and reactivity

10.1. Reactivity	Not available.
10.2. Chemical stability	Material is stable under normal conditions.
10.3. Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
10.4. Conditions to avoid	Contact with incompatible materials.
10.5. Incompatible materials	Chlorine.
10.6. Hazardous decomposition products	No hazardous decomposition products are known.

SECTION 11: Toxicological information

General information	Occupational exposure to the substance or mixture may cause adverse effects.
Information on likely routes of exposure	
Inhalation	Harmful if inhaled. May cause damage to organs through prolonged or repeated exposure by inhalation.
Skin contact	Due to lack of data the classification is not possible. Dust or powder may irritate the skin.
Eye contact	Dust may irritate the eyes.
Ingestion	Harmful if swallowed. Harmful if swallowed.
Symptoms	Dusts may irritate the respiratory tract, skin and eyes. Coughing.

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity	Harmful if inhaled. Harmful if swallowed. Harmful if swallowed. May cause respiratory irritation.

Product	Species	Test Results
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)		
Acute		
Dermal		
LD50	Rabbit	1930 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation	Due to partial or complete lack of data the classification is not possible.
Serious eye damage/eye irritation	Due to partial or complete lack of data the classification is not possible.
Respiratory sensitisation	Due to partial or complete lack of data the classification is not possible.
Skin sensitisation	Due to partial or complete lack of data the classification is not possible.
Germ cell mutagenicity	Suspected of causing genetic defects.

Carcinogenicity Suspected of causing cancer.

Hungary. 26/2000 EüM Ordinance on protection against and preventing risk relating to exposure to carcinogens at work (as amended)

divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)

IARC Monographs. Overall Evaluation of Carcinogenicity

divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	2B Possibly carcinogenic to humans.

Reproductive toxicity Suspected of damaging the unborn child.

Specific target organ toxicity - single exposure Respiratory tract irritation.

Specific target organ toxicity - repeated exposure Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard Due to partial or complete lack of data the classification is not possible.

Mixture versus substance information No information available.

11.2. Information on other hazards

Endocrine disrupting properties Not available.

Other information Not available.

SECTION 12: Ecological information

12.1. Toxicity Very toxic to aquatic life. Toxic to aquatic life with long lasting effects. Accumulation in aquatic organisms is expected.

Product		Species	Test Results
divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)			
Aquatic			
Acute			
Fish	LC50	Tigerfish, crescent perch (Therapon jarbua)	0,62 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

12.2. Persistence and degradability No data is available on the degradability of this product.

12.3. Bioaccumulative potential No data available.

Partition coefficient n-octanol/water (log Kow) Not available.

Bioconcentration factor (BCF) Not available.

12.4. Mobility in soil No data available.

12.5. Results of PBT and vPvB assessment Not a PBT or vPvB substance or mixture.

12.6. Endocrine disrupting properties Not available.

12.7. Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

12.8. Additional information

Estonia Dangerous substances in soil Data

divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	Vanadium (V) 1000 mg/kg
	Vanadium (V) 300 mg/kg
	Vanadium (V) 50 mg/kg

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.
EU waste code	The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Disposal methods/information	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Special precautions	Dispose in accordance with all applicable regulations.

SECTION 14: Transport information

ADR

14.1. UN number	UN2862
14.2. UN proper shipping name	VANADIUM PENTOXIDE, non-fused form
14.3. Transport hazard class(es)	
Class	6.1
Subsidiary risk	-
Label(s)	6.1
Hazard No. (ADR)	60
Tunnel restriction code	E
14.4. Packing group	III
14.5. Environmental hazards	Yes
14.6. Special precautions for user	Not assigned.

RID

14.1. UN number	UN2862
14.2. UN proper shipping name	VANADIUM PENTOXIDE, non-fused form
14.3. Transport hazard class(es)	
Class	6.1
Subsidiary risk	-
Label(s)	6.1
14.4. Packing group	III
14.5. Environmental hazards	Yes
14.6. Special precautions for user	Not assigned.

ADN

14.1. UN number	UN2862
14.2. UN proper shipping name	VANADIUM PENTOXIDE, non-fused form
14.3. Transport hazard class(es)	
Class	6.1
Subsidiary risk	-
Label(s)	6.1
14.4. Packing group	III
14.5. Environmental hazards	Yes
14.6. Special precautions for user	Not assigned.

IATA

14.1. UN number	UN2862
14.2. UN proper shipping name	Vanadium pentoxide non-fused form
14.3. Transport hazard class(es)	
Class	6.1
Subsidiary risk	-
14.4. Packing group	III
14.5. Environmental hazards	Yes
ERG Code	6L

14.6. Special precautions for user Not assigned.

Other information

Passenger and cargo aircraft Allowed with restrictions.

Cargo aircraft only Allowed with restrictions.

IMDG

14.1. UN number UN2862

14.2. UN proper shipping name VANADIUM PENTOXIDE non-fused form, MARINE POLLUTANT

14.3. Transport hazard class(es)

Class 6.1

Subsidiary risk -

14.4. Packing group III

14.5. Environmental hazards

Marine pollutant Yes

EmS F-A, S-A

14.6. Special precautions for user Not assigned.

ADN; ADR; IATA; IMDG; RID

Marine pollutant

SECTION 15: Regulatory information

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

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended

Not listed.

Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use, as amended - Conditions of restriction given for the associated entry number should be considered

divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.

divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)

Regulation 2019/1148 on Marketing and Use of Explosive Precursors, Annex I, as amended

Not listed.

Regulation 2019/1148 on Marketing and Use of Explosive Precursors, Annex II, as amended

Not listed.

Other regulations	The product is classified and labelled in accordance with EC directives or respective national laws This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006. Pregnant women should not work with the product, if there is the least risk of exposure.
National regulations	Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work. Follow national regulation for work with chemical agents.

France regulations

France INRS Table of Occupational Diseases

divanadium pentaoxide; vanadium pentoxide (CAS 1314-62-1)	Rhinites et asthmes professionnels 66

15.2. Chemical safety assessment	No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations	Not available.
References	Not available.
Information on evaluation method leading to the classification of mixture	Not applicable.
Full text of any statements, which are not written out in full under sections 2 to 15	H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inhaled. H319 Causes serious eye irritation. H335 May cause respiratory irritation. H341 Suspected of causing genetic defects. 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.
Revision information	Composition / Information on Ingredients: Ingredient Classification SECTION 16: Other information: Further information
Training information	Follow training instructions when handling this material.
Further information	Transportation Emergency Call Chemtrec at: US: 800.424.9300 International: 703.741.5970 Spain: 900.868.538 Switzerland: 0800.564.402 Chemtrec's toll free, mobile-enabled number in Germany – 0800 1817059 South Korea Toll-free Number – 080-880-0468
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