SAFETY DATA SHEET
ACCORDING TO EC-REGULATIONS 1907/2006
(REACH) & 1272/2008 (CLP)

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SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1	**Product identifier**	
	Chemical Name	Vanadium Carbide Nitride
	Trade name	NITROVAN®
	CAS No.	12069-91-9
	EINECS No.	Not listed
	REACH Registration No.	01-2119983497-18-0000
1.2	**Relevant identified uses of the substance or mixture and uses advised against**	
	Identified use(s)	A vanadium-nitrogen alloy used as a strengthener in the steelmaking process
	Uses advised against	No information available
1.3	**Details of the supplier of the safety data sheet**	
	Company Identification	Steptoe and Johnson L.L.P., Avenue Louise 489, B1050 Brussels, Belgium
	Telephone	+32 2626 0507
	E-Mail (competent person)	sds@steptoe.com
	Company Identification	BUSHVELD VAMETCO (Proprietary) Limited P. O. Box 595 Brits, 0250 South Africa
	Telephone	+27 12 318 3200
	E-Mail (competent person)	smtileni@bushveldvametco.co.za
1.4	**Emergency telephone number**	
	Emergency Phone No.	National Poisons Information Service +44 844 892 0111 or +44 8454 24 24 24 Bushveld Vametco +27 12 318 3200 (M-F 07h00 – 16h00 only) Time Zone is GMT +2

SECTION 2: HAZARDS IDENTIFICATION

2.1	**Classification of the substance or mixture**	
2.1.1	**Regulation (EC) No. 1272/2008 (CLP).**	Not classified
2.1.2	**Directive 67/548/EEC & Directive 1999/45/EC**	Not classified
2.2	**Other hazards**	
2.2.1	**Label elements**	According to Regulation (EC) No. 1272/2008 (CLP).
	Hazard pictogram(s)	Not classified
	Signal word(s)	Not classified
	Hazard statement(s)	Not classified
	Precautionary statement(s)	Not classified
2.2.2	Label elements	According to Directive 67/548/EEC & Directive 1999/45/EC
	Hazard Symbol	Not classified
	Risk Phrases	Not classified
	Safety Phrases	Not classified
2.3	Other hazards	Chips may cause corneal injury. Handling of this substance may produce particles which could be considered a nuisance dust. Nuisance dust can cause unpleasant or uncomfortable deposits in the eyes, ears and nose, but does not cause any toxic effect or disease when exposures are kept in reasonable control, at or below the recommended exposure limits. Airborne concentrations of nuisance dusts in the workplace may also lead to reduced visibility.
2.4	Additional Information	None

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SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

EC Classification No. 1272/2008

Component	%W/W	CAS No.	REACH Registration No.	Hazard statement(s)
Vanadium Carbide Nitride	98 to 99%	12069-91-9	01-2119983497-18-0000	Not classified.

EC Classification No. 67/548/EEC

Component	%W/W	CAS No.	REACH Registration No.	EC Classification and Risk Phrases
Vanadium Carbide Nitride	98 to 99%	12069-91-9	01-2119983497-18-0000	Not classified.

3.2 Mixtures

Not applicable

3.3 Additional Information

For full text of H/P phrases see section 16.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation	Remove from exposure. Keep patient at rest and give oxygen if breathing difficult. If symptoms develop, obtain medical attention.
Skin Contact	After contact with skin, wash immediately with plenty of soap and water. If symptoms develop, obtain medical attention.
Eye Contact	Remove particles by irrigating with eye wash solution or clean water, holding the eyelids apart. If symptoms develop, obtain medical attention.
Ingestion	Unlikely to be hazardous if swallowed. Provided the patient is conscious, wash out mouth with water and give 200-300 ml (half a pint) of water to drink. Do not induce vomiting. If symptoms develop, obtain medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Eye Contact: Dust may cause irritation. Chips may cause corneal injury.

Skin Contact: Repeated and/or prolonged contact may cause dermatitis.

Inhalation: Dust may cause irritation. (Coughing/Sneezing.) Extreme or repeated exposure may cause acute bronchitis like symptoms.

4.3 Indication of any immediate medical attention and special treatment needed

See Section: 4.1

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable Extinguishing Media	Non-flammable. Class D fire. Extinguishing media As appropriate for surrounding fire. Extinguish preferably with dry chemical, sand or carbon dioxide.
Unsuitable Extinguishing Media	Do not use water jet or water spray on burning material as it may generate hydrogen gas.

5.2 Special hazards arising from the substance or mixture

Oxidizes in air at temperatures above 150ºC with slow conversion to vanadium oxides.

5.3 Advice for fire-fighters

A self contained breathing apparatus and suitable protective clothing should be worn in fire conditions. Avoid generation of dust. Avoid release to the environment. Do not allow to enter drains, sewers or watercourses.

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SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1	**Personal precautions, protective equipment and emergency procedures**	Ensure suitable personal protection (including respiratory protection) during removal of spillages. Avoid generation of dust. Dust clouds are sensitive to ignition by electrostatic discharge.
6.2	**Environmental precautions**	Avoid release to the environment. Do not allow to enter drains, sewers or watercourses.
6.3	**Methods and material for containment and cleaning up**	Transfer the bulk of the spillage mechanically to a clean, suitably sized container such as an open-top steel drum with clamp-fitted lid. Mechanical transfer can be either manual (eg. shovel) or machine-aided in the case of larger spills (eg Bobcat FEL). Vacuum the undersize and add the contents to a separate clean drum. Avoid generating excessive dust (>1.0 mg / m3). The containers are to be sealed and disposal procedure discussed between supplier and customer, the prime issue being contamination of the material, and not by the material.
6.4	**Reference to other sections**	See Section: 13.
6.5	**Additional Information**	None

SECTION 7: HANDLING AND STORAGE

7.1	**Precautions for safe handling**	Handle in accordance with operating regulations. Where suitable engineering controls are not fitted or are inadequate, wear suitable protective equipment. Do not eat, drink or smoke at the work place. Wash hands before eating, drinking or smoking. Avoid dust generation. Avoid inhalation of dusts. Use of sweeping compounds may reduce dusting.
7.2	**Conditions for safe storage, including any incompatibilities**	Keep only in the original container. Keep container tightly closed, in a cool, well ventilated place. Keep away from heat and direct sunlight.
	Storage Temperature	< 150°C
	Storage Life	Stable under normal conditions.
	Incompatible materials	None
7.3	**Specific end use(s)**	Industrial use only.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1	**Control parameters**	
8.1.1	**Occupational exposure limits**	1 mg vanadium per m^3 for vanadium alloys (NIOSH) 5 mg per m^3 for Respirable Dust (PNOR)** (US OSHA) 15 mg per m^3 for Total Dust (PNOR)** (US OSHA) **PNOR = Particulates Not Otherwise Regulated
8.1.2	**Biological limit value**	No information available.
8.1.3	**PNECs and DNELs**	No information available.
8.2	**Exposure controls**	
8.2.1	**Appropriate engineering controls**	Provide adequate ventilation when using the material and follow the principles of good occupational hygiene to control personal exposures. Avoid dust generation. Avoid friction, sparks, or other means of ignition.
8.2.2	**Personal protection equipment**	
	Eye/face protection	Wear suitable eye/face protection.(EN 166).

Skin protection (Hand protection/ Other)	Wear suitable gloves. Contaminated clothing should be thoroughly cleaned.

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	Respiratory protection 	Provide adequate ventilation, including appropriate local extraction if dusts, fumes or vapours are likely to be evolved. Wear suitable respiratory protective equipment if exposure to high levels of material are likely.
	Thermal hazards	Dust is combustible. Pellets will burn slowly if heated to a high temperature in air. Oxidizes in air at temperatures above 150ºC with slow conversion to vanadium oxides.
8.2.3	**Environmental Exposure Controls**	Avoid release to the environment. Do not allow to enter drains, sewers or watercourses.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Solid. 35gm each)
Colour.	Dark. Grey. metallic
Odour	Slightly sulphurous
Odour threshold (ppm)	No information available.
pH (Value)	Not applicable.
Melting point (°C)	2427°C .
Boiling point/boiling range (°C):	No information available.
Flash point (°C)	Not applicable. Non-flammable.
Flammability (solid, gas)	Not applicable. Non-flammable.
Vapour pressure (Pascal)	Essentially zero
Vapour density (Air=1)	No information available.
Specific Gravity	No information available.
Bulk Density	1.6 g/cm³
Solubility (Water)	Insoluble
Fat solubility (g/l)	Insoluble
Partition coefficient (n-Octanol/water)	No information available.
Auto ignition point (°C)	Not applicable. Non-flammable.
Decomposition temperature (°C)	No information available.
Viscosity (mPa. s)	No information available.
Explosive properties	Dust is combustible. Pellets will burn slowly if heated to a high temperature in air.
Oxidising properties	Oxidizes in air at temperatures above 150ºC with slow conversion to vanadium oxides.

9.2 Other information — No information available.

SECTION 10: STABILITY AND REACTIVITY

10.1	**Reactivity**	No information available.
10.2	**Chemical stability**	Stable under normal conditions.
10.3	**Possibility of hazardous reactions**	Dust is combustible. Pellets will burn slowly if heated to a high temperature in air.
10.4	**Conditions to avoid**	Situations which cause dusting, fire and high temperatures
10.5	**Incompatible materials**	None.
10.6	**Hazardous Decomposition Product(s)**	Oxidizes in air at temperatures above 150ºC with slow conversion to vanadium oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

11.1.1 Substances

Acute toxicity

Ingestion	Not classified. Unlikely to be hazardous if swallowed.

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	Inhalation	Not classified. May cause irritation to the respiratory system.
	Skin Contact	Not classified. Skin contact may cause contact dermatitis with itching and rash.
	Eye Contact	Not classified. Dust may have irritant effect on eyes. Chips may cause corneal injury.
	Serious eye damage/irritation	No information available.
	respiratory or skin sensitization	No information available.
	Mutagenicity	Not classified.
	Carcinogenicity	Not classified.
	Reproductive toxicity	Not classified.
	STOT - single exposure	No information available.
	STOT - repeated exposure	Inhalation: Extreme or repeated exposure may cause acute bronchitis like symptoms.
	Aspiration hazard	No information available.
11.2	**Other information**	No information available.

SECTION 12: ECOLOGICAL INFORMATION

12.1	**Toxicity**	The substance is essentially insoluble in water. No environmental hazards have been reported or known.
12.2	**Persistence and degradability**	Will very slowly oxidize to vanadium oxide.
12.3	**Bio accumulative potential**	No information available.
12.4	**Mobility in soil**	No information available.
12.5	**Results of PBT and vPvB assessment**	Not classified as PBT or vPvB.
12.6	**Other adverse effects**	None identified

SECTION 13: DISPOSAL CONSIDERATIONS

This product does not possess characteristics which may qualify it as hazardous waste.

13.1	**Waste treatment methods**	Dispose surplus or waste materials in accordance with local or national regulatory guidelines. Normal disposal is via incineration operated by an accredited disposal contractor. Recover or recycle if possible.
13.2	**Additional Information**	Avoid release to the environment. Do not allow to enter drains, sewers or watercourses.

SECTION 14: TRANSPORT INFORMATION

14.1	**Land transport (ADR/RID)**	Not classified as dangerous for transport. Observe Local Regulations.
14.2	**Sea transport (IMDG)**	Not classified as dangerous for transport. Container shipments require a Container Packing Certificate
14.3	**Air transport (ICAO/IATA)**	Not classified as dangerous for transport. No limit on quantity
14.4	**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	No information available.

SECTION 15: REGULATORY INFORMATION

15.1	**Safety, health and environmental regulations/legislation specific for the substance or mixture**	
15.1.1	**EU regulations**	
	Authorisations and/or restrictions on use	None
15.1.2	**National regulations**	None
15.2	**Chemical Safety Assessment**	Not carried out

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SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: 1-16.

LEGEND

LTEL	Long Term Exposure Limit
STEL	Short Term Exposure Limit
STOT	Specific Target Organ Toxicity
DNEL	Derived No Effect Level
PNEL	Predicted No Effect Concentration

References:

Regulation (EC) No. 1272/2008 (CLP).
(Directive 67/548/EEC & Directive 1999/45/EC)

Risk Phrases and Safety Phrases

Not classified.

Hazard statement(s) and Precautionary statement(s)

Not classified.

Training advice:

None required

Additional Information;

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Annex to the extended Safety Data Sheet (eSDS)

Identified use(s)

Manufacture			
Identified use(s) number	**Identified use(s) name**	**Substance supplied to that use**	**Use descriptors**
1	Manufacture of vanadium carbide nitride	No information available	**Process category [PROC]** PROC21 Low energy manipulation of substances bound in materials and/or articles PROC22 Potentially closed processing opera-ions with minerals/metals at elevated temperature Industrial setting **Environmental release categories [ERC]:** ERC1 Manufacture of substances

Industrial use			
Identified use(s) number	**Identified use(s)name**	**Substance supplied to that use**	**Use descriptors**
1	Industrial use of vanadium carbide nitrate in steel industry	as such / in a mixture	**Process category [PROC]** PROC21 Low energy manipulation of substances bound in materials and/or articles PROC22 Potentially closed processing opera-ions with minerals/metals at elevated temperature Industrial setting PROC23 Open processing and transfer operations with minerals/metals at elevated temperature **Chemical product category [PC] :** PC7 Base metals and alloys **Environmental release categories [ERC]:** ERC4 Industrial use of processing aids in processes and products, not becoming part of articles ERC5 Industrial use resulting in inclusion into or onto a matrix ERC6b Industrial use of reactive processing aids **Sectors of use [SU]:** SU14 Manufacture of basic metals, including alloys **Subsequent service life relevant for that use?:** Yes

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Professional use			
Identified use(s) number	**Identified use(s)name**	**Substance supplied to that use**	**Use descriptors**
1	Professional use of vanadium carbide nitrate containing articles	as such / in a mixture	**Process category [PROC]** PROC21 Low energy manipulation of substances bound in materials and/or articles PROC24 High (mechanical) energy work-up of substances bound in materials and/or articles **Environmental release categories [ERC]:** ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix **Subsequent service life relevant for that use?:** Yes

Service life of substances in articles			
Identified use(s) number	**Identified use(s)name**	**Substance supplied to that use**	**Use descriptors**
1	Service life of vanadium carbide nitrate steel articles	-	**Article Categories [AC]** AC7 Metal articles **Environmental release categories [ERC]:** ERC10a Wide dispersive outdoor use of long-life articles and materials with low release ERC11a Wide dispersive indoor use of long-life articles and materials with low release