

Material Safety Data Sheet

(MSDS)

Printing date 03/30/2017

Version - No. 3

Reviewed on 03/30/2017

1 Identification

- **1.1 Product identifier**
- **Trade name: VITROPERM[®], VITROLAM[®]**
- **Article number:**
 VITROPERM[®] 400, -500, -615, -800, -850, -320
 VITROLAM[®] 400 P8 U, - 466 P8, -476 P8, -477 P8

 ® registered trademark of VACUUMSCHMELZE GmbH & Co. KG
- **Material Safety Data Sheet - no.:** SDB43
- **Application of the substance / the mixture** semi-finished products and parts
- **1.3 Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
 VACUUMSCHMELZE GmbH & Co.KG
 Grüner Weg 37
 D-63450 Hanau

 datasheet@vacuumschmelze.com
- **Information department:** Environmental Protection Department
- **1.4 Emergency telephone number:**
 Tel. no.: (**49) 6181/38-0
 Emergency tel. no.: via (**49) 6181/38-0

2 Hazard(s) identification

- **2.2 Classification (substance or mixture)**
 Classification according to Regulation (EC) No 1272/2008 (CLP-Regulation):
 Not applicable
 Our semi-finished and finished products constitute manufactured articles under the terms of the REACH Regulation (EC) No. 1907/2006.
 For articles there is no obligation to classify acc. to CLP -Regulation.
- **2.2 Labelling according to Regulation (EC) No 1272/2008**
 Labelling according to Regulation (EC) No 1272/2008 (CLP-Regulation):
 Not applicable
- **Additional VAC information:**
In the case of dust-producing processing, we recommend observance of the following warnings :
- **Hazard statements**
 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
 May cause an allergic skin reaction.
 May cause cancer.
 Suspected of damaging fertility or the unborn child.
- **Precautionary statements**
 Do not breathe dust.
 Use personal protective equipment as required.
 Specific treatment (see on this label).
 If experiencing respiratory symptoms: Call a POISON CENTER/doctor.
 Wash contaminated clothing before reuse.
 If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing.
 IF exposed or concerned: Get medical advice/attention.
 If skin irritation or rash occurs: Get medical advice/attention.
 IF ON SKIN: Wash with plenty of water.
 Store locked up.
 Dispose of contents/container in accordance with local/regional/national/international regulations.
- **2.3 Other hazards**

Danger of accident!
 Always wear protective clothing, protective glasses and safety gloves when handling the bands.
 - The bands have sharp edges. There is a danger of (serious) injury from cuts.
 - The bands can split and cause (serious) cuts when bent excessively

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- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

3 Composition/information on ingredients

3.2 Chemical characterization:

• Description:

VITROPERM®: Metal in compact form

VITROLAM®: Layered composite foil: VITROPERM® 800 / adhesive tape with PET film backing

• Dangerous components:

The classifications given below reflect the classification of each pure substance respectively and are intended for information only

The legal classifications of the pure substances (harmonized classification according to substance list of the Annex VI of the CLP Regulation) got complemented, insofar as additional substance-specific information from accessible data sources (e.g. TRGS 905, toxicological studies) for health hazards and / or physical hazards are available.

The concentration of cobalt might be ≥ 0,1% (impurities)

The concentration of nickel might be ≥ 0,1% (impurities)

CAS: 7439-89-6 EINECS: 231-096-4	iron	rest%
CAS: 7440-21-3 EINECS: 231-130-8	silicon	< 10%
CAS: 7440-42-8 EINECS: 231-151-2	boron ⚠ Acute Tox. 4, H302	< 2.5%
CAS: 7440-50-8 EINECS: 231-159-6	copper	< 1%
CAS: 7440-48-4 EINECS: 231-158-0 Index number: 027-001-00-9	cobalt ⚠ Resp. Sens. 1, H334; Carc. 1B, H350; Repr. 2, H361; ⚠ Acute Tox. 4, H302; Skin Sens. 1, H317	< 1%
CAS: 7440-02-0 EINECS: 231-111-4 Index number: 028-002-00-7	nickel ⚠ Carc. 2, H351; STOT RE 1, H372; ⚠ Skin Sens. 1, H317	< 0.5%
• NON-hazardous Ingredients		
CAS: 7440-03-1 EINECS: 231-113-5	niobium	< 6%

• Additional information:

Additional information for VITROLAM®:

The adhesive tape(s) has (have) not been classified according to the CLP Regulation by the manufacturer.

Information on the adhesive tape: PET film backing - adhesive: polyacrylate

4 First-aid measures

• 4.1 Description of first aid measures

• After inhalation:

If metal vapours or solid dusts have been inhaled:

Get the affected person out in the fresh air and call a doctor.

• After skin contact:

Foreign bodies which have penetrated the skin must be removed and the wound cleaned thoroughly.

• After eye contact:

Foreign bodies must be removed, consult a doctor if necessary.

Beware of metal splinters - Consult a doctor immediately.

• After swallowing: Consult a doctor if the symptoms persist.

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

No further relevant information available.

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- **4.3 Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

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5 Fire-fighting measures

- **5.1 Extinguishing media**
- **Suitable extinguishing agents:**
VITROPERM[®]: Non-combustible. Extinguishing agents must be adapted to the environment.
VITROLAM[®]: Adhesive tapes are combustible. CO₂, extinguishing powder or water spray.
Fight larger fires with water spray or alcohol resistant foam.
- **5.2 Special hazards arising from the substance or mixture**
Formation of toxic smoke / fumes (metal / metal oxides) is possible during heating or in case of fire. Do not inhale fumes.
- **5.3 Advice for firefighters**
- **Protective equipment:** No special measures required.

6 Accidental release measures

Accidental release of dusts and vapours which are damaging to health can be ruled out.

- **6.1 Personal precautions, protective equipment and emergency procedures**
No special measures required.
- **6.2 Environmental precautions:** No special measures required.
- **6.3 Methods and material for containment and cleaning up:** No special measures required.
- **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

- **7.1 Precautions for safe handling**

Danger of accident!

Always wear protective clothing, protective glasses and safety gloves when handling the bands.

- The bands have sharp edges. There is a danger of (serious) injury from cuts.
- The bands can split and cause (serious) cuts when bent excessively.

No more safety precautions are necessary in the delivered form.

The appropriate industrial and environmental safety measures must be taken for processing steps which cause dust (see also section 8):

Ensure good ventilation/exhaustion at the workplace.
Take note of emission threshold.

- **Information about protection against explosions and fires:** No special measures required.
- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Storage class:** Not applicable
- **7.3 Specific end use(s)** No further relevant information available.

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8 Exposure controls/personal protection

• **Additional information about design of technical systems:**

Suction and filtering and good ventilation of the working area must be provided for processes where dust is formed.

Approved industrial vacuum cleaners of at least dust class L must be used (DIN EN 60335-2-69).

Suitable breathing apparatus must be used during repair and maintenance work on suction systems (see personal safety equipment).

• **8.1 Control parameters**

• **Components with limit values that require monitoring at the workplace:**

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.

At this time, the remaining constituent has no known exposure limits.

7439-89-6 iron	
EV (Canada)	Long-term value: 1* 5** mg/m ³ as iron; *salts, water-soluble; **welding fume
7440-21-3 silicon	
PEL (USA)	Long-term value: 15* 5** mg/m ³ *total dust **respirable fraction
REL (USA)	Long-term value: 10* 5** mg/m ³ *total dust **respirable fraction
TLV (USA)	TLV withdrawn
EL (Canada)	Long-term value: 10* 3** mg/m ³ *total dust; **respirable fraction
EV (Canada)	Long-term value: 10 mg/m ³ total dust
7440-50-8 copper	
PEL (USA)	Long-term value: 1* 0.1** mg/m ³ as Cu *dusts and mists **fume
REL (USA)	Long-term value: 1* 0.1** mg/m ³ as Cu *dusts and mists **fume
TLV (USA)	Long-term value: 1* 0.2** mg/m ³ *dusts and mists; **fume; as Cu
EL (Canada)	Long-term value: 1* 0.2** mg/m ³ *dusts and mists; **fume, as Cu
EV (Canada)	Long-term value: 0.2* 1** mg/m ³ as copper, *fume; **dust and mists
7440-48-4 cobalt	
PEL (USA)	Long-term value: 0.1* mg/m ³ as Co; *for metal dust and fume
REL (USA)	Long-term value: 0.05 mg/m ³ as Co; metal dust & fume
TLV (USA)	Long-term value: 0.02 mg/m ³ BEI
EL (Canada)	Long-term value: 0.02 mg/m ³ as Co; IARC 2B
EV (Canada)	Long-term value: 0.1 mg/m ³
7440-02-0 nickel	
PEL (USA)	Long-term value: 1 mg/m ³
REL (USA)	Long-term value: 0.015 mg/m ³ as Ni; See Pocket Guide App. A
TLV (USA)	Long-term value: 1.5* mg/m ³ elemental, *inhalable fraction

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EL (Canada)	Long-term value: 0.05 mg/m ³ ACGIH A1, IARC 2B
EV (Canada)	Long-term value: 1 mg/m ³ Inhalable fraction

• DNELs

DNELs for OSH purposes

In Germany, occupational exposure limits (AGW) of the Technical Rules on Hazardous Substances (TRGS) 900 continue to constitute workplace atmospheric limit values that are binding upon employers. Should no AGW and for example no maximum workplace concentration (MAK value) of the German Research Foundation (DFG) be available, the employer must also consider the DNEL during risk assessment. (Source: Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung (IFA))

7440-48-4 cobalt		
Inhalative	Langzeitexposition - Inhalation - lokale Wirkung	0.04 mg/m ³ (Ind)
		0.0063 mg/m ³ (Consumer)
7440-02-0 nickel		
Inhalative	Langzeitexposition - Inhalation - lokale Wirkung	0.05 mg/m ³ (Ind)
	Langzeitexposition - Inhalation - system. Wirkung	0.05 mg/m ³ (Ind)

• Ingredients with biological limit values:

7440-48-4 cobalt	
BEI (USA)	15 µg/L Medium: urine Time: end of shift at end of workweek Parameter: Cobalt (background)
	1 µg/L Medium: blood Time: end of shift at end of workweek Parameter: Cobalt (background, semi-quantitative)

• Additional Occupational Exposure Limit Values for possible hazards during processing:

If the occurrence of Boric acid/ Boron oxide cannot be ruled out, the appropriate workplace-related limit values must also be monitored!

• Additional information:

The lists that were valid during the creation were used as basis.

GESTIS International Limit Values:

<http://www.dguv.de/ifa/Gefahrstoffdatenbanken/GESTIS-Internationale-Grenzwerte-für-chemische-Substanzen-limit-values-for-chemical-agents/index.jsp>

• 8.2 Exposure controls

• Personal protective equipment:

• General protective and hygienic measures:

- Keep away from foodstuffs, beverages and feed.
- Wash hands before breaks and at the end of work.
- Store protective clothing separately.
- Do not eat, drink, smoke or sniff while working.

• Breathing equipment:



In the case of dust formation (limit value exceeded), breathing apparatus must be worn. Time limits for wearing must be observed.

Breathing mask, apparatus with particle filter P2 or P3, for example:

- Full face mask (EN 136)
- Breathing mask (EN 149) FFP2 or FFP3
- 10 times the limit value (FFP2)
- 30 times the limit value (FFP3)
- Recommendation: P3

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• **Protection of hands:**



Avoid repeated and prolonged contact with the skin, use protective gloves.

Preventive skin protection by use of skin-protecting agents is recommended.

• **Material of gloves** Omitted

• **Penetration time of glove material** Omitted

• **Eye protection:**



In the event of larger quantities of dust:
Wear protective glasses / EN 166, poss. with side protection.

• **Limitation and supervision of exposure into the environment**

The legal issue values and limitations are to be paid attention!

9 Physical and chemical properties

• **9.1 Information on basic physical and chemical properties**

General Information

The physical and chemical properties of this section refer to the alloy **VITROPERM[®]**.

• **Appearance:**

Form:	Strip
Color:	Metallic
Odor:	Odourless

• **pH-value:** Not applicable.

• **Change in condition**

Melting point/Melting range (approx): 1100-1200 °C

• **Auto igniting:** Not applicable

• **Danger of explosion:** Not applicable

• **Vapor pressure:** Not determined.

• **Density (approx) at 20 °C:** 7.1 g/cm³

• **Relative density** Not determined.

• **Solubility in / Miscibility with**

Water: Insoluble.

• **Partition coefficient (n-octanol/water):** Not determined.

• **9.2 Other information** No further relevant information available.

10 Stability and reactivity

• **10.1 Reactivity** No further relevant information available.

• **10.2 Chemical stability**

• **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

• **10.3 Possibility of hazardous reactions**

Hydrogen is released in contact with acid which can cause explosive gas mixtures.

• **10.4 Conditions to avoid** No further relevant information available.

• **10.5 Incompatible materials:** No further relevant information available.

• **10.6 Hazardous decomposition products:** No dangerous decomposition products known.

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11 Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity:** Based on available data, the classification criteria are not met.
- **LD/LC50 values:**

The following applies for the **pure substances**:

7440-42-8 boron		
Oral	LD50	650 mg/kg (rat)
7440-48-4 cobalt		
Oral	LD50	550 mg/kg (rat)
Inhalative	LC50/4 h	--- mg/l (rat) siehe zusätzlicher toxikologischer Hinweis / see additional toxicological information
7440-02-0 nickel		
Oral	LD50	> 9000 mg/kg (rat)

- **Primary irritant effect:**

- **on the skin:** Based on available data, the classification criteria are not met.
- **on the eye:**
Irritation of the eyes in the case of massive direct contact will be mainly due to mechanical effects depending on the grain size.

- **Sensitization:**

In the case of repeated and prolonged contact with the skin with metallic nickel there is a possibility of sensitization (Skin Sens. 1).

In the case of repeated and prolonged contact with the skin with metallic cobalt there is a possibility of sensitization (Skin Sens. 1).

Cobalt in the form of inhalable dust can lead to hypersensitisation when inhaled (Resp. Sens. 1)

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

May cause an allergic skin reaction.

- **Subacute to chronic toxicity:**

Additional Information for Cobalt:

Currently in the EU cobalt metal is not classified as carcinogenic according to Annex VI of the CLP regulation (EC No. 1272/2008). German law classified cobalt metal in the form of respirable dusts/aerosols within Category 3 (DSD; RL 67/548/EWG). At the time of EU regulations becoming effective the positive results of the cobalt metal study carried out by the NTP 1* were not available.

A new classification within EU regulations based on the results of that study is deemed necessary by German authorities. Since this will be a time consuming process cobalt metal in the form of respirable dusts/aerosols has been classified within German national regulations (TRGS 905) as category 2 (DSD) and category 1B (CLP) in the meanwhile.

* http://ntp.niehs.nih.gov/ntp/about_ntp/trpanel/2013/october/draft_tr-581.pdf

- **Additional toxicological information:**

- **Carcinogenic categories**

• IARC (International Agency for Research on Cancer)		
7440-48-4	cobalt	2B
7440-02-0	nickel	2B
• NTP (National Toxicology Program)		
7440-48-4	cobalt	R
7440-02-0	nickel	R
• OSHA-Ca (Occupational Safety & Health Administration)		
None of the ingredients is listed.		

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12 Ecological information

- **12.1 Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **12.2 Persistence and degradability** No further relevant information available.
- **12.3 Bioaccumulative potential** No further relevant information available.
- **12.4 Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:** Not known to be hazardous to water.
- **12.5 Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **12.6 Other adverse effects** No further relevant information available.

13 Disposal considerations

- **13.1 Waste treatment methods**
- **Recommendation:** Observe official regulations.
- **Uncleaned packagings:** Not applicable

14 Transport information

• DOT	Void
• DOT	
• Class	Void
• DOT	Void
• Special precautions for user	Not applicable.
• 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
• Transport/Additional information:	
• ADR	
• Remarks:	Non-hazardous goods from the standpoint of the specified regulations

• Maritime transport IMDG:	
• Remarks:	Non-hazardous goods from the standpoint of the specified regulations

• Air transport ICAO-TI and IATA-DGR	
• Remarks:	Non-hazardous goods from the standpoint of the specified regulations
• UN "Model Regulation":	Void

15 Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **National regulations:**
- **Additional national classification:**

Additional Information for Cobalt:

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* http://ntp.niehs.nih.gov/ntp/about_ntp/trpanel/2013/october/draft_tr-581.pdf

- **Information about limitation of use:** --
- **Technical instructions (air):** The emission values and limitations must be observed!
- **Water hazard class:** Alloys in solid form do not pose an ecological threat.
- **Other regulations, limitations and prohibitive regulations**
e.g.
 - guidelines 67/548/ECC, 1999/45/EC
 - 1272/2008/EG (CLP)
 - 1907/2006/EG (REACH)
 - German Hazardous Substances
- **15.2 Chemical safety assessment:** Void (for articles)

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Relevant phrases**

Wording of the hazard warnings mentioned (Chapter 3) for pure substances:

H302 Harmful if swallowed.

H317 May cause an allergic skin reaction.

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H350 May cause cancer.

H351 Suspected of causing cancer.

H361 Suspected of damaging fertility or the unborn child.

H372 Causes damage to organs through prolonged or repeated exposure.

- **Department issuing SDS:**

Department HT-F

Tel. 06181/38-2045

- **Contact:**

Environmental Protection Department

Tel. 06181/38-2359

- **Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

DNEL: Derived No-Effect Level (REACH)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

OSHA: Occupational Safety & Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

BEI: Biological Exposure Limit

Acute Tox. 4: Acute toxicity – Category 4

Resp. Sens. 1: Respiratory sensitisation – Category 1

Skin Sens. 1: Skin sensitisation – Category 1

Carc. 1B: Carcinogenicity – Category 1B

Carc. 2: Carcinogenicity – Category 2

Repr. 2: Reproductive toxicity – Category 2

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STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1

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• **Sources**

- KÜHN-BIRETT-Merkblätter gefährlicher Arbeitsstoffe
- Technische Regeln für Gefahrstoffe

- * **Data compared to the previous version altered.**

USA