# Material Safety Data Sheet
**(MSDS)**

Printing date 09/27/2024 Version - No. 3 Reviewed on 09/27/2024

## 1 Identification

- **Product identifier**
- **Trade name:** **VITROPERM® 712**
- **Article number:**

® registered trademark of VACUUMSCHMELZE GmbH & Co. KG

- **Material Safety Data Sheet - no.:** IB129
- **Application of the substance / the mixture** semi-finished products and parts
- **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
- **Emergency telephone number:**
Tel. no.: (**49) 6181/38-0
Emergency tel. no.: via (**49) 6181/38-0

## 2 Hazard(s) identification

- **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.
- **GHS label elements**
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.
Suspected of causing genetic defects.
May cause cancer.
May damage fertility or the unborn child.
Causes damage to the respiratory system through prolonged or repeated exposure. Route of exposure: Inhalation.
- **Precautionary statements**
Do not breathe dust/fume/gas/mist/vapors/spray.
Do not eat, drink or smoke when using this product.
Avoid release to the environment.
Use personal protective equipment as required.
In case of inadequate ventilation wear respiratory protection.
Get medical advice/attention if you feel unwell.
- **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.

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## 3 Composition/information on ingredients

- **Chemical characterization:**
- **Description:** Metal in compact form
- **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.
  * = possible inpurties

| | | |
|---|---|---|
| CAS: 7439-89-6<br>EINECS: 231-096-4 | iron (compact form) | rest% |
| CAS: 7440-21-3<br>EINECS: 231-130-8 | silicon | <10% |
| CAS: 7440-02-0<br>EINECS: 231-111-4<br>Index number: 028-002-00-7 | nickel<br>Carcinogenicity 2, H351; Specific Target Organ Toxicity - Repeated Exposure 1, H372; Sensitization - Skin 1, H317 | <2% |
| CAS: 7440-42-8<br>EINECS: 231-151-2 | boron<br>Acute Toxicity - Oral 4, H302 | <2% |
| CAS: 7440-48-4<br>EINECS: 231-158-0<br>Index number: 027-001-00-9 | cobalt<br>Sensitization - Respiratory 1, H334; Germ Cell Mutagenicity 2, H341; Carcinogenicity 1B, H350; Toxic to Reproduction 1B, H360;<br>Sensitization - Skin 1, H317 | <2% |
| CAS: 7440-50-8<br>EINECS: 231-159-6<br>Index number: 029-024-00-X | copper | ~1% |

- **NON-hazardous Ingredients**

| | | |
|---|---|---|
| CAS: 7440-03-1<br>EINECS: 231-113-5 | niobium (compact form) | ~5% |

- **Additional information:**
  For the wording of the listed hazard phrases refer to section 16.

  **Additional information for Cobalt:**
  See also Chapter 11

## 4 First-aid measures

- **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.

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- **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.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed**
  No further relevant information available.

## 5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
  Non-combustible.
  Extinguishing agents must be adapted to the environment.
- **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.
- **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.

- **Personal precautions, protective equipment and emergency procedures** No special measures required.
- **Environmental precautions:** No special measures required.
- **Methods and material for containment and cleaning up:** No special measures required.
- **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

- **Handling:**
- **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):
  Prevent formation of dust.
  Ensure good ventilation/exhaustion at the workplace.
  Take note of emission threshold.
- **Information about protection against explosions and fires:** No special measures required.

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- **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
- **Specific end use(s)** No further relevant information available.

## 8 Exposure controls/personal protection

- **Additional information about design of technical systems:**
  Provide suction with filtering for good airing and ventilation of the work area during processing steps which cause dust. Air return is only permitted in exceptional cases.
  If industrial vacuum cleaners are used, these must have dust class H (DIN EN 60335-2-69).
  Suitable breathing apparatus must be used during repair and maintenance work to suction systems, especially when changing filters (see personal safety equipment).
- **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 other constituents have no known exposure limits.

| **7440-21-3 silicon** | |
|---|---|
| PEL (USA) | Long-term value: 15* 5** mg/m³<br>*total dust **respirable fraction |
| REL (USA) | Long-term value: 10* 5** mg/m³<br>*total dust **respirable fraction |
| TLV (USA) | TLV withdrawn |
| EL (Canada) | Long-term value: 10* 3** mg/m³<br>*total dust;**respirable fraction |
| EV (Canada) | Long-term value: 10 mg/m³<br>total dust |
| **7440-02-0 nickel** | |
| PEL (USA) | Long-term value: 1 mg/m³ |
| REL (USA) | Long-term value: 0.015 mg/m³<br>as Ni; See Pocket Guide App. A |
| TLV (USA) | Long-term value: 1.5* mg/m³<br>elemental, *inhalable fraction, A5, BEI |
| EL (Canada) | Long-term value: 0.05 mg/m³<br>ACGIH A1, IARC 2B |
| EV (Canada) | Long-term value: 1 mg/m³<br>Inhalable fraction |
| **7440-48-4 cobalt** | |
| PEL (USA) | Long-term value: 0.1* mg/m³<br>as Co; *for metal dust and fume |
| REL (USA) | Long-term value: 0.05 mg/m³<br>as Co; metal dust & fume |
| TLV (USA) | Long-term value: 0.02* 0.005** mg/m³<br>RSEN,DSEN,A3,BEI,**thoracic particulates,A2 |

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| | |
|---|---|
| EL (Canada) | Long-term value: 0.005 mg/m³<br>thoracic, ACGIH A2, IARC 2A, S(R) |
| EV (Canada) | Long-term value: 0.1 mg/m³ |
| **7440-50-8 copper** | |
| PEL (USA) | Long-term value: 1* 0.1** mg/m³<br>as Cu *dusts and mists **fume |
| REL (USA) | Long-term value: 1* 0.1** mg/m³<br>as Cu *dusts and mists **fume |
| TLV (USA) | Long-term value: 1* 0.2** mg/m³<br>*dusts and mists; **fume; as Cu |
| EL (Canada) | Long-term value: 1* 0.2** mg/m³<br>*dusts and mists; **fume, as Cu |
| EV (Canada) | Long-term value: 0.2* 1** mg/m³<br>as copper, *fume;**dust and mists |

- **DNELs**

| | | |
|---|---|---|
| **7440-02-0 nickel** | | |
| Inhalative | Langzeitexposition - Inhalation - lokale Wirkung | 0.05 mg/m³ (Ind) |
| | Langzeitexposition - Inhalation - system. Wirkung | 0.05 mg/m³ (Ind) |
| **7440-48-4 cobalt** | | |
| Inhalative | Langzeitexposition - Inhalation - lokale Wirkung | 0.04 mg/m³ (Ind)<br>0.0063 mg/m³ (Consumer) |

- **Ingredients with biological limit values:**

| | |
|---|---|
| **7440-02-0 nickel** | |
| BEI (USA) | 5 µg/L<br>Medium: urine<br>Time: post-shift at end of workweek<br>Parameter: Nickel (background)<br><br>30 µg/L<br>Medium: urine<br>Time: post-shift at end of workweek<br>Parameter: Nickel (background) |
| **7440-48-4 cobalt** | |
| BEI (USA) | 15 µg/L<br>Medium: urine<br>Time: end of shift at end of workweek<br>Parameter: Cobalt (nonspecific) |

- **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!
  For thermal processes in the presence of atmospheric oxygen, oxidic nickel compounds must always be assumed.

- **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

- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
  Keep away from foodstuffs, beverages and feed.

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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
According to the guideline "42 CFR Part 84 Respiratory Protective Devices" the following respiratory masks / particel filter are recommend: N 95 or N 99

- **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**
Experience has shown glove materials polychloroprene, nitrile caoutchouc, butyl caoutchouc, fluoride caoutchouc and polyvinylchloride to offer sufficient protection.
- **Penetration time of glove material**
-
-

- **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

| | |
|---|---|
| • **Information on basic physical and chemical properties** | |
| • **General Information** | |
| • **Appearance:** | |
| **Form:** | Strip |
| **Color:** | Metallic |
| • **Odor:** | Odourless |
| • **pH-value:** | Not applicable. |
| • **Change in condition** | |
| **Melting point/Melting range (approx):** | 1,100 °C |
| • **Ignition temperature:** | Not applicable |
| • **Danger of explosion:** | Not applicable |
| • **Vapor pressure:** | Not determined. |
| • **Density (approx) at 20 °C:** | 7.2 g/cm³ |
| • **Relative density** | Not determined. |
| • **Solubility in / Miscibility with** | |
| **Water:** | Insoluble. |

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| | |
|---|---|
| • **Partition coefficient (n-octanol/water):** | Not determined. |
| • **Other information** | No further relevant information available. |

## 10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions**
  Hydrogen is released in contact with acid which can cause explosive gas mixtures.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

## 11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**
- **LD/LC50 values:**

The following applies for the pure substances:

| | | |
|---|---|---|
| **7440-02-0 nickel** | | |
| Oral | LD50 | >9,000 mg/kg (rat) |
| **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)<br>siehe zusätzlicher toxikologischer Hinweis / see additional toxicological information |

- **Primary irritant effect:**
- **on the skin:** No irritant effect.
- **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:** No sensitizing effects known.
- **Additional toxicological information:**

  Subsequent users should be aware of the fact that Co-metal fine powder are classified as “acute toxic if inhaled, Category 1” (no legal classification); LC50 4hr ≤0,05 mg/l.
  In case the subsequent use of product generates fine Co-metal particles (e.g. dust), protection measures such as described in Chapter 7 and 8 of this information sheet must be applied.
- **Carcinogenic categories**

| • **IARC (International Agency for Research on Cancer)** | | |
|---|---|---|
| 7440-02-0 | nickel | 2B |
| 7440-48-4 | cobalt | 2A |

| • **NTP (National Toxicology Program)** | | |
|---|---|---|
| 7440-02-0 | nickel | R |

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| | | |
|---|---|---|
| 7440-48-4 | cobalt | R |

• **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

## 12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:** Alloys in solid form do not pose an ecological threat.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

## 13 Disposal considerations

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

## 14 Transport information

| | |
|---|---|
| • **Special precautions for user** | Not applicable. |
| • **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 |

## 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**

• **Section 355 (extremely hazardous substances):**

None of the ingredient is listed.

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| • **Section 313 (Specific toxic chemical listings):** | |
|---|---|
| 7440-02-0 | nickel |
| 7440-48-4 | cobalt |
| 7440-50-8 | copper |

| • **TSCA (Toxic Substances Control Act):** |
|---|
| All components have the value ACTIVE. |

| • **Hazardous Air Pollutants** | |
|---|---|
| 7440-48-4 | cobalt |

| • **Chemicals known to cause cancer:** | |
|---|---|
| 7440-02-0 | nickel |
| 7440-48-4 | cobalt |

| • **Chemicals known to cause reproductive toxicity for females:** |
|---|
| None of the ingredients is listed. |

| • **Chemicals known to cause reproductive toxicity for males:** |
|---|
| None of the ingredients is listed. |

| • **Chemicals known to cause developmental toxicity:** |
|---|
| None of the ingredients is listed. |

| • **TLV (Threshold Limit Value)** | | |
|---|---|---|
| 7440-02-0 | nickel | A5 |
| 7440-48-4 | cobalt | A3 |

| • **NIOSH-Ca (National Institute for Occupational Safety and Health)** | |
|---|---|
| 7440-02-0 | nickel |

- **National regulations:**
- **Information about limitation of use:**
  Employment restrictions concerning young persons must be observed.
  Employment restrictions concerning pregnant and lactating women must be observed.
  Workers are not allowed to be exposed to the hazardous carcinogenic materials contained in this preparation.
  Exceptions can be made by the authorities in certain cases.
  --
- **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.
  - 1272/2008/EG (CLP)
  - 1907/2006/EG (REACH)
  - German Hazardous Substances
- **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.
  H341 Suspected of causing genetic defects.

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H350 May cause cancer.
H351 Suspected of causing cancer.
H360 May damage fertility or the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure.

- **Department issuing SDS:**
  Department OPS-C SE
  Tel. 06181/38-2045
- **Contact:**
  Environmental Protection Department
  Tel. 06181/38-2796
- **Date of preparation / last revision** 09/27/2024 / -
- **Abbreviations and acronyms:**
  ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)
  IMDG: International Maritime Code for Dangerous Goods
  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
  NIOSH: National Institute for Occupational Safety
  OSHA: Occupational Safety & Health
  TLV: Threshold Limit Value
  PEL: Permissible Exposure Limit
  REL: Recommended Exposure Limit
  BEI: Biological Exposure Limit
  Acute Toxicity - Oral 4: Acute toxicity – Category 4
  Sensitization - Respiratory 1: Respiratory sensitisation – Category 1
  Sensitization - Skin 1: Skin sensitisation – Category 1
  Germ Cell Mutagenicity 2: Germ cell mutagenicity – Category 2
  Carcinogenicity 1B: Carcinogenicity – Category 1B
  Carcinogenicity 2: Carcinogenicity – Category 2
  Toxic to Reproduction 1B: Reproductive toxicity – Category 1B
  Specific Target Organ Toxicity - Repeated Exposure 1: Specific target organ toxicity (repeated exposure) – Category 1
- **Sources**
  - GESTIS
  - Technische Regeln für Gefahrstoffe
- *** Data compared to the previous version altered.**