

Matzerial Safety Data Sheet

(MSDS)

Printing date 07/24/2017

Version - No. 2

Reviewed on 07/24/2017

1 Identification

- **1.1 Product identifier**
- **Trade name: VITROBRAZE®**
- **Article number:**
VITROBRAZE 2170, 2099, 2177

® registered trademark of VACUUMSCHMELZE GmbH & Co. KG
- **Material Safety Data Sheet - no.:** SDB115
- **Application of the substance / the mixture** Brazing foil
- **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.
Causes damage to organs through prolonged or repeated exposure.
- **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.
- **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
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

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3 Composition/information on ingredients

• **3.2 Chemical characterization:**

• **Description:** Brazing foil

• **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.

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	29-68%
CAS: 7440-47-3 EINECS: 231-157-5	chromium	11-25%
CAS: 7439-89-6 EINECS: 231-096-4	iron	0-50%
CAS: 7723-14-0 EINECS: 231-768-7 Index number: 015-002-00-7	red phosphorus ⚠ Flam. Liq. 2, H225; Flam. Sol. 1, H228	≤ 8%
CAS: 7440-21-3 EINECS: 231-130-8	silicon	< 3%
CAS: 7439-98-7 EINECS: 231-107-2	molybdenum	< 2%
CAS: 7440-42-8 EINECS: 231-151-2	boron ⚠ Acute Tox. 4, H302	< 2%
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%

• **Remark to the composition:**

VITROBRAZE 2170 and VITROBRAZE 2177 contain < 1% iron and < 0,5% molybdenum

• **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

• **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:**
Non-combustible.
Extinguishing agents must be adapted to the environment.
- **5.2 Special hazards arising from the substance or mixture**
In the event of a fire, dangerous/toxic fumes or vapours may be produced. Do not inhale fumes.
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:** Wear self-contained respiratory protective device.

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 protective measures are required in the provided form.

The appropriate industrial and environmental safety measures must be taken for processing steps which cause dust or fumer (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:** Store in dry conditions and in the dark.
- **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:

Provide a suitable suction with filter and good ventilation of the working area for all processing steps.

Suitable breathing apparatus must be used (see personal safety equipment) for repair and maintenance work on suction systems, especially when changing the filters.

• 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.

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
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
7440-47-3 chromium	
PEL (USA)	Long-term value: 1 mg/m ³
REL (USA)	Long-term value: 0.5* mg/m ³ *metal+inorg.compds.as Cr; See Pocket Guide App. C
TLV (USA)	Long-term value: (0.5) 0.5* mg/m ³ *inhalable fraction, as Cr(0)
IOELV (EU)	Long-term value: 2 mg/m ³ as Cr
EL (Canada)	Long-term value: 0.5 mg/m ³ as metal
EV (Canada)	Long-term value: 0.05 mg/m ³
7439-89-6 iron	
EV (Canada)	Long-term value: 1* 5** mg/m ³ as iron; *salts, water-soluble; **welding fume
7723-14-0 red phosphorus	
REL (USA)	Long-term value: 0.1 mg/m ³
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
7439-98-7 molybdenum	
PEL (USA)	Long-term value: 15* mg/m ³ *Total dust, as Mo
TLV (USA)	Long-term value: 10* 3** mg/m ³ as Mo; *inhalable fraction **respirable fraction

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EL (Canada)	Long-term value: 3* 10** mg/m ³ as Mo; *respirable **inhalable
EV (Canada)	Long-term value: 10* 3** 0.5*** mg/m ³ metal,insol.compnd.:*inh,**resp;sol.compnd.:***resp
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) NIC-0.02* mg/m ³ *inh. fraction; NIC-Skin, DSEN, RSEN (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

• **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)) current values are available: <http://www.dguv.de/ifa/gestis/gestis-dnel-liste/index.jsp>.

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)
7440-48-4 cobalt		
Inhalative	Langzeitexposition - Inhalation - lokale Wirkung	0.04 mg/m ³ (Ind)
		0.0063 mg/m ³ (Consumer)

• **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.

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• **Breathing equipment:**



In the case of exceeding the limit values, 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

• **Protection of hands:**



Wearing of gloves with a high cutting protection class is recommended for handling the bands.

The following applies due to the ingredients:

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:**



Tightly sealed goggles (EN 166)

• **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**

• **Appearance:**

Form:	Strip
Color:	Metallic
Odor:	Odourless

• **pH-value:** Not applicable.

• **Change in condition**

Melting point/Melting range (approx): 900-1000 °C

• **Auto igniting:** Not applicable

• **Danger of explosion:** Not applicable

• **Vapor pressure:** Not determined.

• **Density (approx) at 20 °C:** 7.7 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.

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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.
Phosphin (toxic gas) can form in contact with acids!
- **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.

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**:

The following applies for the pure substance (here: nickel):

7440-02-0 nickel		
Oral	LD50	> 9000 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) siehe zusätzlicher toxikologischer Hinweis / see additional toxicological information

- **Primary irritant effect:**
- **on the skin:** see sensitization
- **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:**
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
- **Subacute to chronic toxicity:**
Nickel in the form of a respirable dust is under suspicion as a possible cause of cancer in humans (Carc.2)

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:**

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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
7440-47-3	chromium	3
7440-48-4	cobalt	2B

• **NTP (National Toxicology Program)**

7440-02-0	nickel	R
7440-48-4	cobalt	R

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

None of the ingredients is listed.

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	Void
• 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

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• 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:

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.

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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:
H225 Highly flammable liquid and vapor.
H228 Flammable solid.
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.

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• 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)
ICAO: International Civil Aviation Organisation
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
Flam. Liq. 2: Flammable liquids – Category 2
Flam. Sol. 1: Flammable solids – Category 1
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
STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1

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