

## 1 Identification

- **Product identifier**
- **Trade name:** **VITROBRAZE<sup>®</sup>**
- **Article number:**  
VITROBRAZE<sup>®</sup> 2188, 2120, 2111, 2133, 2150, 2135, 2190, 2152, 2154, 2187  
  
® registered trademark of VACUUMSCHMELZE GmbH & Co. KG
- **Material Safety Data Sheet - no.:** IB80
- **Application of the substance / the mixture** Brazing foil
- **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.  
Suspected of causing cancer. Route of exposure: Oral, Inhalation, Dermal.  
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.

## 3 Composition/information on ingredients

- **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.

**The concentration of cobalt might be  $\geq 0,1\%$  (impurities)**

CAS: 7440-02-0 EINECS: 231-111-4 Index number: 028-002-00-7	nickel ⚠ Carcinogenicity 2, H351; Specific Target Organ Toxicity - Repeated Exposure 1, H372; ⚠ Sensitization - Skin 1, H317	60-92%
CAS: 7439-89-6 EINECS: 231-096-4	iron (compact form)	0-30%
CAS: 7440-47-3 EINECS: 231-157-5	chromium	7-20%
CAS: 7440-21-3 EINECS: 231-130-8	silicon	<10%
CAS: 7439-98-7 EINECS: 231-107-2	molybdenum	<5%
CAS: 7440-42-8 EINECS: 231-151-2	boron ⚠ Acute Toxicity - Oral 4, H302	<4%
CAS: 7440-48-4 EINECS: 231-158-0 Index number: 027-001-00-9	cobalt ⚠ Sensitization - Respiratory 1, H334; Germ Cell Mutagenicity 2, H341; Carcinogenicity 1B, H350; Toxic to Reproduction 1B, H360; ⚠ Sensitization - Skin 1, H317	$\leq 1\%$

- **Remark to the composition:**

- VITROBRAZE 2133 doesn't contain any chromium.
- The molybdenum concentration mentioned only applies for the alloys VITROBRAZE 2188 und 2135
- VITROBRAZE 2190 doesn't contain any silicium ( $\leq 0,3\%$ )

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

## 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:** 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.

- **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 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 fumes (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.

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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:** Store in dry conditions and in the dark.
- **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 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.

### • 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 <sup>3</sup>
REL (USA)	Long-term value: 0.015 mg/m <sup>3</sup> as Ni; See Pocket Guide App. A
TLV (USA)	Long-term value: 1.5* mg/m <sup>3</sup> elemental, *inhalable fraction, A5, BEI
EL (Canada)	Long-term value: 0.05 mg/m <sup>3</sup> ACGIH A1, IARC 2B
EV (Canada)	Long-term value: 1 mg/m <sup>3</sup> Inhalable fraction
7439-89-6 iron (compact form)	
EV (Canada)	Long-term value: 1* 5** mg/m <sup>3</sup> as iron; *salts, water-soluble; **welding fume
7440-47-3 chromium	
PEL (USA)	Long-term value: 1 mg/m <sup>3</sup>
REL (USA)	Long-term value: 0.5* mg/m <sup>3</sup> *metal+inorg.compds.as Cr; See Pocket Guide App. C
TLV (USA)	Long-term value: 0.003* 0.5** mg/m <sup>3</sup> inh. fraction, *as Cr(III): A4, **metal
IOELV (EU)	Long-term value: 2 mg/m <sup>3</sup> as Cr
EL (Canada)	Long-term value: 0.5 mg/m <sup>3</sup> as metal
EV (Canada)	Long-term value: 0.05 mg/m <sup>3</sup>
7440-21-3 silicon	
PEL (USA)	Long-term value: 15* 5** mg/m <sup>3</sup> *total dust **respirable fraction

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REL (USA)	Long-term value: 10* 5** mg/m <sup>3</sup> *total dust **respirable fraction
TLV (USA)	TLV withdrawn
EL (Canada)	Long-term value: 10* 3** mg/m <sup>3</sup> *total dust; **respirable fraction
EV (Canada)	Long-term value: 10 mg/m <sup>3</sup> total dust

## 7439-98-7 molybdenum

PEL (USA)	Long-term value: 15* mg/m <sup>3</sup> *Total dust, as Mo
TLV (USA)	Long-term value: 10* 3** mg/m <sup>3</sup> as Mo; *inhalable fraction ** respirable fraction
EL (Canada)	Long-term value: 3* 10** mg/m <sup>3</sup> as Mo; *respirable **inhalable
EV (Canada)	Long-term value: 10* 3** 0.5*** mg/m <sup>3</sup> metal, insol. compd.: *inh; **resp; sol. compd.: ***resp

## 7440-48-4 cobalt

PEL (USA)	Long-term value: 0.1* mg/m <sup>3</sup> as Co; *for metal dust and fume
REL (USA)	Long-term value: 0.05 mg/m <sup>3</sup> as Co; metal dust & fume
TLV (USA)	Long-term value: 0.02* mg/m <sup>3</sup> *inh. fraction; DSEN, RSEN, BEI, A3
EL (Canada)	Long-term value: 0.005 mg/m <sup>3</sup> thoracic, ACGIH A2, IARC 2A, S(R)
EV (Canada)	Long-term value: 0.1 mg/m <sup>3</sup>

## • DNELs

### 7440-02-0 nickel

Inhalative	Langzeitexposition - Inhalation - lokale Wirkung	0.05 mg/m <sup>3</sup> (Ind)
	Langzeitexposition - Inhalation - system. Wirkung	0.05 mg/m <sup>3</sup> (Ind)

### 7440-48-4 cobalt

Inhalative	Langzeitexposition - Inhalation - lokale Wirkung	0.04 mg/m <sup>3</sup> (Ind)
		0.0063 mg/m <sup>3</sup> (Consumer)

## • Ingredients with biological limit values:

### 7440-02-0 nickel

BEI (USA)	5 µg/L Medium: urine Time: post-shift at end of workweek Parameter: Nickel (background)
	30 µg/L Medium: urine Time: post-shift at end of workweek Parameter: Nickel (background)

### 7440-47-3 chromium

BEI (USA)	0.7 µg/L Medium: urine Time: end of shift at end of workweek Parameter: Total chromium (population based)
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## 7440-48-4 cobalt

BEI (USA)	15 µg/L
	Medium: urine
	Time: end of shift at end of workweek
	Parameter: Cobalt (nonspecific)

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

If the occurrence of chrome (VI) compounds cannot be ruled out, the TRGS 910 (acceptance and tolerance concentrations) must be considered!

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.

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 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:



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.

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)

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- **Limitation and supervision of exposure into the environment**  
The legal issue values and limitations are to be paid attention!

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## 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):** 1,000-1,100 °C

- **Auto igniting:** Not applicable

- **Danger of explosion:** Not applicable

- **Vapor pressure:** Not determined.

- **Density (approx) at 20 °C:** 7.6-7.9 g/cm<sup>3</sup>

- **Relative density** Not determined.

- **Solubility in / Miscibility with Water:** Insoluble.

- **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:**

**7440-02-0 nickel**

Oral	LD50	>9,000 mg/kg (rat)
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**7440-42-8 boron**

Oral	LD50	650 mg/kg (rat)
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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:** 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:** --

• **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

• **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 official regulations.

• **Uncleaned packagings:** Not applicable

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## 14 Transport information

• <b>Special precautions for user</b>	Not applicable.
• <b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b>	Not applicable.
• <b>Transport/Additional information:</b>	
• <b>ADR</b>	
• <b>Remarks:</b>	Non-hazardous goods from the standpoint of the specified regulations
• <b>Maritime transport IMDG:</b>	
• <b>Remarks:</b>	Non-hazardous goods from the standpoint of the specified regulations
• <b>Air transport ICAO-TI and IATA-DGR</b>	
• <b>Remarks:</b>	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.

• **Section 313 (Specific toxic chemical listings):**

7440-02-0 nickel

7440-47-3 chromium

7440-48-4 cobalt

• **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

• **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

7440-47-3 chromium

A4

7439-98-7 molybdenum

A3

7440-48-4 cobalt

A3

• **NIOSH-Ca (National Institute for Occupational Safety and Health)**

7440-02-0 nickel

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- **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.  
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- **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.  
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** 04/21/2023
- **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

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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.**

— USA —