

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

- **1.1 Product identifier**

- **Trade name:**

**Permanent magnet, double coated  
(nickel + gold)**

**VACOMAX®**

- **Detailed descriptions:**

VACOMAX® 225, -240, -262  
(all qualities)

® registered trademark of VACUUMSCHMELZE GmbH & Co. KG

- **Information sheet - no.:** IB135

- **Remarks for information sheet**

Our semi-finished and finished products constitute manufactured and distributed articles under the terms of the REACH Regulation (EC) No. 1907/2006.

Articles are not subject to any legal obligation concerning production and distribution of material safety data sheets. The detailed information usually shown in a safety data sheet will be provided in the form of an 'Information sheet for articles' for specific alloys.

However, we expressly point out that these information sheets for articles are voluntarily produced data sheets which are not governed by the requirements of the REACH regulation.

- **1.2 Relevant identified uses of the substance or mixture and uses advised against** Not applicable

- **Application of the article:** PERMANENT MAGNETS e.g. in motors, sensors, medical technology

- **1.3 Details of the supplier of the information sheet**

- **Manufacturer/Supplier:**

VACUUMSCHMELZE GmbH & Co.KG  
Grüner Weg 37  
D-63450 Hanau

datasheet@vacuumschmelze.com

- **Further information obtainable from:** Environmental Protection Department

- **1.4 Emergency telephone number:**

Tel. no.: (\*\*49) 6181/38-0  
Emergency tel. no.: via (\*\*49) 6181/38-0

## SECTION 2: Hazards identification

- **2.2 Classification (substance or mixture)**

Classification according to Regulation (EC) No 1272/2008 (CLP-Regulation):

Not applicable

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 :**

The hazard statements result from the ingredients (composition) of the permanent magnets and the applied coating.

**Additional information:**

See also Chapter 11

- **Hazard statements**

(See also 'Other hazards' (chapter 2.3))

Harmful if swallowed.

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

May cause an allergic skin reaction.

May cause cancer by inhalation. Route of exposure: Inhalation.

Suspected of damaging fertility.

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May cause damage to organs through prolonged or repeated exposure.  
May cause long lasting harmful effects to aquatic life.

• **Precautionary statements**

Do not breathe dust/fume/gas/mist/vapours/spray.  
In case of inadequate ventilation wear respiratory protection.  
Use personal protective equipment as required.  
Avoid release to the environment.  
Do not eat, drink or smoke when using this product.  
If skin irritation occurs: Get medical advice/attention.

• **2.3 Other hazards**

**Dry mechanical processing** of rare earth permanent alloys is only permitted under special safety precautions because dusts which are capable of self-heating or pyrophorous dusts with a tendency to explode may be produced.

**In the case of wet mechanical processing** the watery processing medium reacts with the magnet wear and may form hydrogen already at room temperature.

Attention: Formation of Ex-atmospheres possible!

Part of the resulting hydrogen is stored in the material. The resulting processing sludges must be kept under a protective liquid because drying out sludges are capable of self-heating or may react pyrophorously. In this case the stored hydrogen volume burns off with flames.

**Attention:**

Magnetized parts generate magnetic fields and are able to attract magnetizable materials. This may result in injury during handling of magnets.

Electronic devices and measuring tools may be changed in calibration or damaged by the high magnetic field strength.

Please keep magnetized magnets away from computers, displays and magnetic storage devices. Especially people with heart pacemakers must keep away from magnetic fields.

• **Results of PBT and vPvB assessment**

• **PBT:** Not applicable.

• **vPvB:** Not applicable.

## SECTION 3: Composition/information on ingredients

• **3.2 Chemical characterization:**

• **Description:** Metal in compact form

• **Components(composition):**

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: 7440-48-4 EINECS: 231-158-0 Index number: 027-001-00-9 RTECS: GF 8750000	cobalt ☠ Resp. Sens. 1, H334; Carc. 1B, H350i; Repr. 2, H361f; ☠ Acute Tox. 4, H302; Skin Sens. 1, H317; Aquatic Chronic 4, H413	≤ 52%
CAS: 7440-19-9 EINECS: 231-128-7	samarium	~ 25%
CAS: 7439-89-6 EINECS: 231-096-4 RTECS: NO 4565500	iron	rest%
CAS: 7440-50-8 EINECS: 231-159-6 RTECS: GL 5325000	copper	~ 5%

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CAS: 7440-67-7 EINECS: 231-176-9 Index number: 040-001-00-3 RTECS: ZH 7070000	zirconium	~ 3%
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	**%
CAS: 7440-57-5 EINECS: 231-165-9	gold	**%

• **Remark to the composition:**

\*\* = Essential part of plating  
(Double coating nickel + gold)  
Note: The gold coating contains ~ 0,2 % Co

• **Additional information:**

For the wording of the listed risk phrases refer to section 16.

**Additional information for rare earth:**

See also Chapter 11

**Additional information for Cobalt:**

See also Chapter 11

## SECTION 4: First aid measures

• **4.1 Description of first aid measures**

• **After inhalation:**

If metal vapours or 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:**

Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

• **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.

• **4.3 Indication of any immediate medical attention and special treatment needed**

No further relevant information available.

## SECTION 5: Firefighting 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**

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.

## SECTION 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.

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- **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.

## SECTION 7: Handling and storage

- **7.1 Precautions for safe handling**  
 No protective measures are required in the provided form.  
**Dry mechanical processing** of rare earth permanent alloys is only permitted under special safety precautions because dusts which are capable of self-heating or pyrophorous dusts with a tendency to explode may be produced.  
**In the case of wet mechanical processing** the watery processing medium reacts with the magnet wear and may form hydrogen already at room temperature.  
 Attention: Formation of Ex-atmospheres possible!  
 Part of the resulting hydrogen is stored in the material. The resulting processing sludges must be kept under a protective liquid because drying out sludges are capable of self-heating or may react pyrophorously. In this case the stored hydrogen volume burns off with flames.  
 Also see section 8.
- **Information about fire - and explosion protection:**  
 No particular measures are required in the provided form.
- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage:**  
 Keep magnetized magnets away from computers, displays and magnetic storage devices. Especially people with heart pacemakers must keep away from magnetic fields.
- **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:** Not applicable
- **Storage class:** Not applicable
- **7.3 Specific end use(s)** No further relevant information available.

## SECTION 8: Exposure controls/personal protection

- **Additional information about design of technical facilities:**  
 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**
- **Ingredients with limit values that require monitoring at the workplace:**  
 For International Limit Values see Additional information below.
- **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))

<b>7440-48-4 cobalt</b>		
Inhalative	Long-term exposure - inhalation - local effects	0,04 mg/m <sup>3</sup> (Ind) 0,0063 mg/m <sup>3</sup> (Consumer)
<b>7440-67-7 zirconium</b>		
Inhalative	Long-term exposure - inhalation - systemic effects	5 mg/m <sup>3</sup> (Ind)

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**7440-02-0 nickel**

Inhalative	Long-term exposure - inhalation - local effects	0,05 mg/m <sup>3</sup> (Ind)
	Long-term exposure - inhalation - systemic effects	0,05 mg/m <sup>3</sup> (Ind)

- **Additional Occupational Exposure Limit Values for possible hazards during processing:**  
Compliance with the general dust limit value(s) (lung penetrating and/or inhalable fraction) must be ensured.

- **Additional information:**

- The lists valid during the making 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.

- **Respiratory protection:**



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

- **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:**



Safety goggles / EN 166, with side shields if necessary, must be worn in dusty environments and when working with magnetised magnets (> 50 g).

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

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

## SECTION 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 unplated permanent magnet alloy.

No values are available for the coating itself.

- **Appearance:**

- **Form:**

Parts

- **Colour:**

Metallic

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• <b>Odour:</b>	Odourless
• <b>pH-value:</b>	Not applicable.
• <b>Change in condition</b> <b>Melting point/Melting range (approx.):</b>	1220-1320 °C
• <b>Self-igniting:</b>	Omitted (in the provided form). Also see section 2 and/or 7.
• <b>Danger of explosion:</b>	Omitted (in the provided form). Also see section 2 and/or 7.
• <b>Vapour pressure:</b>	Not determined.
• <b>Density (approx.) at 20 °C:</b>	8,3 g/cm <sup>3</sup>
• <b>Relative density</b>	Not determined.
• <b>Solubility in / Miscibility with water:</b>	Insoluble.
• <b>9.2 Other information</b>	No further relevant information available.

### SECTION 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.

### SECTION 11: Toxicological information

• **11.1 Information on toxicological effects**

- **Acute toxicity**  
Harmful if swallowed.
- **LD/LC50 values:**

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

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

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

- **Primary irritant effect:**
- **Skin corrosion/irritation**  
Rare earths (see list in Section 2) cause skin irritation depending on grain size (powder) (Skin Irrit. 2)
- **Serious eye damage/irritation**  
Rare earths (see list in Section 2) cause eye irritation depending on grain size (powder) (Eye Irrit. 2)
- **Respiratory or skin sensitisation**  
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)

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

• **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.

• **Germ cell mutagenicity** Based on available data, the classification criteria are not met.

• **Carcinogenicity**

May cause cancer by inhalation. Route of exposure: Inhalation.

• **Reproductive toxicity**

Suspected of damaging fertility.

• **STOT-single exposure** Based on available data, the classification criteria are not met.

• **STOT-repeated exposure**

May cause damage to organs through prolonged or repeated exposure.

• **Aspiration hazard** Based on available data, the classification criteria are not met.

### SECTION 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.

### SECTION 13: Disposal considerations

• **13.1 Waste treatment methods**

• **Recommendation** Observe official regulations.

• **Uncleaned packaging:** Not applicable

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### SECTION 14: Transport information

• **Transport/Additional information:**

• **Land transport ADR/RID (cross-border):**

• **Remarks:** Non-hazardous goods from the standpoint of the specified regulations  
**Attention:**  
 Packing boxes with magnetized parts inside generate magnetic fields and are able to attract magnetizable materials.

• **Maritime transport IMDG:**

• **Remarks:** Non-hazardous goods from the standpoint of the specified regulations  
**Attention:**  
 Packing boxes with magnetized parts inside generate magnetic fields and are able to attract magnetizable materials.

• **Air Transport ICAO-TI and IATA-DGR: Non-magnetised parts:**

Not classified as hazardous goods as understood in the ordinance given

**Magnetised parts in packaging units:**

Conduct test for classification as per IATA regulations (see Class 9 / Packing Instruction 953)

If test is positive, the following apply:

**ICAO/IATA class:** Class 9

**UN/ID number:** 2807

**Correct technical name:** Magnetised materials

• **Remarks:**

-

### SECTION 15: Regulatory information

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

• **Directive 2012/18/EU**

• **Named dangerous substances - ANNEX I** None of the ingredients is listed.

• **National regulations:**

• **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

• **Please note:**

**Attention:**

Magnetized parts generate magnetic fields and are able to attract magnetizable materials. This may result in injury during handling of magnets.

Electronic devices and measuring tools may be changed in calibration or damaged by the high magnetic field strength.

Please keep magnetized magnets away from computers, displays and magnetic storage devices. Especially people with heart pacemakers must keep away from magnetic fields.

• **15.2 Chemical safety assessment:** Void (for articles)

### SECTION 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.

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**• Relevant phrases**

Wording of safety instructions quoted (Section 3) concerning pure substances (powder):

H302 Harmful if swallowed.

H317 May cause an allergic skin reaction.

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

H350i May cause cancer by inhalation. Route of exposure: Inhalation.

H351 Suspected of causing cancer. Route of exposure: Inhalation.

H361f Suspected of damaging fertility.

H372 Causes damage to organs through prolonged or repeated exposure.

H413 May cause long lasting harmful effects to aquatic life.

**• Department issuing MSDS:**

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

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

Acute Tox. 4: Acute toxicity, Hazard Category 4

Resp. Sens. 1: Sensitisation - Respirat., Hazard Category 1

Skin Sens. 1: Sensitisation - Skin, Hazard Category 1

Carc. 1B: Carcinogenicity, Hazard Category 1B

Carc. 2: Carcinogenicity, Hazard Category 2

Repr. 2: Reproductive toxicity, Hazard Category 2

STOT RE 1: Specific target organ toxicity - Repeated exposure, Hazard Category 1

STOT RE 2: Specific target organ toxicity - Repeated exposure, Hazard Category 2

Aquatic Chronic 4: Hazardous to the aquatic environment - Chronic Hazard, Category 4

**• Sources**

- KÜHN-BIRETT-Merkblätter gefährlicher Arbeitsstoffe

- Technische Regeln für Gefahrstoffe