

1 Identification of the substance/mixture and of the company/undertaking

- **Product identifier**

- **Trade name:**

**Permanent-Magnet, nickeled
VACODYM®**

- **Detailed descriptions:**

VACODYM 200-299, 600-699, 700-709, 800-809, 4020, 3230 und 3625
(all qualities)

® registered trademark of VACUUMSCHMELZE GmbH & Co. KG

- **Information sheet - no.:** IB59

- **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.

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

- **Application of the article:** PERMANENT MAGNETS e.g. in motors, generators, sensors, E-Mobility

- **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

- **Emergency telephone number:**

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

2 Hazards identification

- **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.

- **Labelling according to Regulation (EC) No 1272/2008**

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

Not applicable

The product is classified and labelled according to the CLP regulation.

- **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.

- **Hazard statements**

See also 'Other hazards'

Causes skin irritation.

Causes serious eye irritation.

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

May cause an allergic skin reaction.

Suspected of causing cancer.

May cause damage to organs through prolonged or repeated exposure.

May cause long lasting harmful effects to aquatic life.

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• **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.

• **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.

3 Composition/information on ingredients

• **Chemical characterization:**

• **Description:** **Nickel** permanent-magnet

• **Components(composition):**

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

CAS: 7439-89-6 EINECS: 231-096-4 RTECS: NO 4565500	iron	rest%
CAS: 7440-00-8 EINECS: 231-109-3	neodymium (powder) ☒ Xi R36/38; ☒ F R11 R53 ⚠ Flam. Sol. 2, H228; ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319; Aquatic Chronic 4, H413	*%
CAS: 7429-91-6 EINECS: 231-073-9	dysprosium (powder) ☒ Xi R36/38; ☒ F R11 R53 ⚠ Flam. Sol. 2, H228; ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319; Aquatic Chronic 4, H413	*%
CAS: 7440-10-0	praseodymium (powder) ☒ Xi R36/38; ☒ F R11 R53 ⚠ Flam. Sol. 2, H228; ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319; Aquatic Chronic 4, H413	*%

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CAS: 7440-48-4 EINECS: 231-158-0 Index number: 027-001-00-9 RTECS: GF 8750000	cobalt ☒ Xn R42/43 R53 ☞ Resp. Sens. 1, H334; ☠ Skin Sens. 1, H317; Aquatic Chronic 4, H413	< 3%
CAS: 7440-02-0 EINECS: 231-111-4 Index number: 028-002-00-7	nickel ☠ T R48/23; ☒ Xn R40; ☒ Xi R43 Carc. Cat. 3 ☞ Carc. 2, H351; STOT RE 1, H372; ☠ Skin Sens. 1, H317	coating%

• **Remark to the composition:**

* The total maximum proportion of rare earths (neodymium, dysprosium and/or praseodymium) is 33%.

• **Additional information:**

For the rare earths listed here, the following apply:

- Classification as per CLP notification (VAC).
- The classifications listed refer exclusively to powder form.
- The rare earths specified are classified as NON-hazardous in solid form.

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.

• **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.

• **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 Firefighting measures

• **Extinguishing media**

• **Suitable extinguishing agents:**

Non-combustible.
Extinguishing agents must be adapted to the environment.

• **Special hazards arising from the substance or mixture** No further relevant information available.

• **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.

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See Section 13 for disposal information.

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7 Handling and storage

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

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.
- **Control parameters**
- **Ingredients with limit values that require monitoring at the workplace:**

The new Hazardous Goods Act (01.01.2005) has revoked the legal basis of the TRK values and abolished these values without replacement. However, the technical limit values will act as guides in determining which exposition levels (based on state-of-the-art technology) had to be undershot at the time the limit values were calculated. For this reason, these values will continue to be listed in Point 8 of the Safety Data Sheet for the time being.

7440-48-4 cobalt	
1. RECOMMENDATION GERMANY (W)	0,1 / 0,5 mg/m ³ TRGS 901-12
7440-02-0 nickel	
1. RECOMMENDATION GERMANY (W)	0,5 E mg/m ³ TRGS 901-78

- **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.

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• **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.
Avoid contact with the eyes and skin.

• **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!

9 Physical and chemical properties

• **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

• **Odour:**

Odourless

• **pH-value:**

Not applicable.

• **Change in condition**

Melting point/Melting range (approx.): 1180 °C

• **Self-igniting:**

Omitted (in the provided form).
Also see section 2 and/or 7.

• **Danger of explosion:**

Omitted (in the provided form).
Also see section 2 and/or 7.

• **Vapour pressure:**

Not determined.

• **Density (approx.) at 20 °C:**

7,7 g/cm³

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- | | |
|--|--|
| • Relative density | Not determined. |
| • Solubility in / Miscibility with water: | Insoluble. |
| • Other information | No further relevant information available. |

10 Stability and reactivity

- **Reactivity**
- **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 (here: nickel and cobalt):

7440-48-4 cobalt		
Oral	LD50	6170 mg/kg (rat)
7440-02-0 nickel		
Oral	LD50	> 9000 mg/kg (rat)

- **Primary irritant effect:**
- **on the skin:**
Irritant to skin and mucous membranes.
Rare earths (see list in Section 2) cause skin irritation depending on grain size (powder) (Skin Irrit. 2) see sensitization
- **on the eye:**
Rare earths (see list in Section 2) cause eye irritation depending on grain size (powder) (Eye Irrit. 2)
- **Sensitization:**
In the case of repeated and prolonged contact with the skin with metallic nickel and cobalt there is a possibility of sensitization.
Cobalt in the form of inhalable dust can lead to hypersensitisation when inhaled.
- **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 (Cat. 2) / CLP-Verordnung)

In Germany, cobalt in the form of inhalable dust is classified as category 3 carcinogenic.

- **Additional toxicological information:**
When used and handled according to specifications, the article not have any harmful effects to our experience and the information provided to us.

12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behaviour in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.

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- **Mobility in soil** No further relevant information available.
- **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 packaging:** Not applicable

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 902)

If test is positive, the following apply:

ICAO/IATA class: Class 9 / Page 172

UN/ID number: 2807

Correct technical name: Magnetised materials

• **Remarks:**

-

15 Regulatory information

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

- **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 safety instructions quoted (Section 3) concerning pure substances (powder):

H228 Flammable solid.

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H319 Causes serious eye irritation.

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

H351 Suspected of causing cancer.

H372 Causes damage to organs through prolonged or repeated exposure.

H413 May cause long lasting harmful effects to aquatic life.

R11 Highly flammable.

R36/38 Irritating to eyes and skin.

R40 Limited evidence of a carcinogenic effect.

R42/43 May cause sensitisation by inhalation and skin contact.

R43 May cause sensitisation by skin contact.

R48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.

R53 May cause long-term adverse effects in the aquatic environment.

- **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 Organization

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

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

- **Sources**

- KÜHN-BIRETT-Merkblätter gefährlicher Arbeitsstoffe

- Technische Regeln für Gefahrstoffe

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