

Safety Information Sheet (SIS)

Trade Names: Nicorros, Cunifer, Konstantan, Nicrofer, Nimofer, Conicro, Pernifer, Pernima, Magnifer, Cronix, VDM Nickeliron, VDM Nickelmanganese, VDM Nickelchrome, Cupronickel, Nickel Silver, Nickel brass, Aluminium-nickel bronze, Magnimat, Kuprodur, Aeterna, Dental Alloys CoCr with or without additional number and/or letter combinations.

Manufacturer / Supplier: Outokumpu VDM GmbH

Valid from: 01.12.2010

Version: SafetyInformationSheet_Nickel alloys

Date of issue: 10.08.2011

revised: 24.05.2013

Replaces issue from: 10.08.2011

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND COMPANY

1.1 Product identification

Name of the substance: Nickel-containing and cobalt-containing alloys in form of semi-finished products according to the trade names.

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Name of Substance	CAS-N°	EC-N°	Index-N°	REACH Registration Number
Nickel	7440-02-0	231-111-4	028-002-00-7	01-2119438727-29-VDM
Chromium	7440-47-3	231-157-5	024-017-00-8	01-2119485652-31-VDM
Cobalt	7440-48-4	231-158-0	027-001-00-9	02-2119485652-31-VDM (only C&L notification)

1.2 Uses of the substance or mixture

1.2.1 Relevant identified uses

The alloys mentioned above have exceptional properties with regard to corrosion resistance and physical and mechanical characteristics according to the information in the material data sheet. The different applications can be obtained from the PROC-Codes (process categories) which are listed in the "Safety Data Assessments" and/or in the relevant dossiers.

1.2.2 Uses advised against

Not applicable.

1.3 Details of the supplier of the Safety Information Sheet

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Created by: Julia Rosenberg (julia.rosenberg@outokumpu.com)

1.4 Emergency telephone number

Tel.-number: +49 2392 55 – 2949 / - 2834 (Only available during office hours)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

The alloys mentioned above consist of a number of substances. Nickel, Chromium and Cobalt are the components of major importance with regard to the hazard classification of stainless steels in solid form.

Nickel

Classification according to Regulation (EC) N° 790/2009 (1.ATP of CLP Regulation: (EC) N° 1272/2008):

Skin sensitiation, Cat. 1; H317

Carcinogenicity, Cat. 2; H351

STOT rep. exp. Cat. 1; H372

Classification according to Directive 67/548/EEC (substances) or Directive 1999/45/EC (mixtures):

R40 (Carc. Cat. 3); R48/23 (Toxic); R43 (May cause sensitisation by skin contact)

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Chromium

Classification according to Regulation (EC) N° 790/2009 (1.ATP of CLP Regulation: (EC) N° 1272/2008):

Skin sensitisation, Cat. 1; H317

Carcinogenicity, Cat. 1B; H350i

Aquatic Acute 1; H440

Aquatic Chronic 1; H410

Classification according to Directive 67/548/EEC (substances) or Directive 1999/45/EC (mixtures):

R49 (Carc. Cat. 2); R 49; R43; R50-53 (N-Dangerous for the environment)

Cobalt

Classification according to Regulation (EC) N° 790/2009 (1.ATP of CLP Regulation: (EC) N° 1272/2008):

Skin sensitisation, Cat. 1; H317

Respiratory sensitisation, Cat. 1; H334

Aquatic Chronic 4; H413

Classification according to Directive 67/548/EEC (substances) or Directive 1999/45/EC (mixtures):

R42/43; R53

2.2 Label elements

Labelling according to Regulation (EC) N° 1272/2008 CLP Regulation

Annex I Segment 1.3.4.:

Metals in massive form and alloys do not require a label according to this Annex, if they do not present a hazard to human health by inhalation, ingestion or contact with skin or to the aquatic environment in the form in which they are placed on the market, although classified as hazardous in accordance with the criteria of the Annex I of the CLP Regulation. Nevertheless the supplier shall provide the information to downstream users or distributors by means of the SIS.

Nickel

Hazard pictograms:



Signal word: DANGER

Hazard Statements:

H317 May cause an allergic skin reaction.

H351 Suspected of causing cancer by inhalation.

H372 Causes damage to organs through prolonged or repeated exposure by inhalation.

Chromium

Hazard pictograms:



Signal word: DANGER

Hazard Statements:

H317 May cause an allergic skin reaction.

H350i May cause cancer by inhalation.

H410 Very toxic to aquatic life with long lasting effects.

Cobalt

Hazard pictograms:



Signal word: DANGER

Hazard Statements:

H317 May cause an allergic skin reaction.

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

H413 May cause long lasting harmful effects to aquatic life.

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Label elements according to Directive 67/548/EEC

Annex VI Segment 8 (Directive 92/32/EEC):

Metals in massive form and alloys do not require a label according to this Annex, if they do not present a hazard to human health by inhalation, ingestion or contact with skin or to the aquatic environment in the form in which they are placed on the market, although classified as hazardous in accordance with the criteria of the Annex I of the CLP Regulation. Nevertheless the supplier shall provide the information to downstream users or distributors by means of the SIS.

Nickel

Hazard symbol: T Hazard description: Toxic

R-phrases:

- R40 Limited evidence of a carcinogenic effect.
- R43 May cause sensitisation by skin contact.
- R48/23 Toxic: danger of serious damage to health by prolonged exposure by inhalation.

S-phrases:

- S22 Do not breathe dust.
- S36 Wear suitable protective clothing.

Chromium

Hazard symbol: T; N Hazard description: Toxic, Dangerous for the environment

R-phrases:

- R43 May cause sensitisation by skin contact.
- R49 May cause cancer by inhalation.
- R50/53 Very toxic to aquatic organisms may cause long-term adverse effects in the aquatic environment.

S-phrases:

- S45 In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S53 Avoid exposure – obtain special instruction before use.
- S60 This material and its container must be disposed of as hazardous waste.
- S61 Avoid release to the environment. Refer to special instructions/Safety Data or Information Sheets.

Cobalt

Hazard symbol: Xn Hazard description: Harmful

R-phrases:

- R42/43 May cause sensitisation by inhalation or skin contact.
- R53 May cause long-term adverse effects in the aquatic environment.

S-phrases:

- S22 Do not breathe dust.
- S24 Avoid contact with skin.
- S37 Wear protective gloves.
- S61 Avoid release to the environment. Refer to special instruction/Safety Data or Information Sheets.

2.3 Other hazards

Alloys containing nickel or chromium may cause health hazards by inhalation of dusts and fumes which can occur through mechanical and thermal treatment (e.g. grinding, polishing, welding or cutting). Prolonged or repeated skin contact may cause dermatitis to nickel-sensitised persons. By handling the product, there is a risk of causing lacerations.

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3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

3.2 Mixtures

This mixture is an alloy with the following components:

Name of Substance	EC-N°	CAS-N°	Percentage [%]
Aluminium	231-072-3	7429-90-5	<5
Chromium	231-157-5	7440-47-3	<65
Cobalt	231-158-0	7440-48-4	<20
Copper	231-159-6	7440-50-8	<90
Iron	231-096-4	7439-89-6	<60
Manganese	231-105-1	7439-96-5	<4
Molybdenum	231-107-2	7439-98-7	<30
Nickel	231-111-4	7440-02-0	10-80
Niobium	231-113-5	7440-03-1	<6
Silicon	231-130-8	7440-21-3	<7
Titanium	231-142-3	7440-32-6	<3
Tungsten	231-143-9	7440-33-7	<15

4. FIRST AID MEASURES

4.1 Description of first aid measures

The following information refer to dusts which can occur through treatment of the alloy.

Inhalation: Fresh air supply and seek medical advice.

Skin contact: Rinse skin with water. In case of skin irritation, consult a physician.

Eyes contact: Flush immediately with plenty of flowing water by holding eyelids apart and consult an ophthalmologist if necessary.

Ingestion: Rinse mouth and consult a doctor if necessary.

4.2 Most important symptoms and effects, both acute and delayed

Cough and breathlessness. Allergic reaction.

4.3 Indication of any immediate medical attention and special treatment needed: See 4.1.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media: Adapt measures of extinguishing to the area, Dry sand.

Unsuitable extinguishing media: In case of major fire and large quantities: water.

5.2 Special hazards arising from the substance or mixture

In case of fire may be liberated: toxic fumes.

5.3 Advice for fire-fighters

Keep breathing equipment ready.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid generation of dust. Provide adequate ventilation. Avoid contact with skin and eyes.

6.2 Environmental precautions

No special environmental measures are necessary.

6.3 Methods and material for containment and cleaning up

Contaminated packages must be disposed of as waste according to section 13.

6.4 Reference to other sections: See protective measures under Section 7 and 8.

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7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid inhalation of aerosols like grinding and polishing dusts and fumes generated by cutting and welding. Ensure good ventilation/exhaustion at the workplace.

7.2 Conditions for safe storage, including any compatibilities

There are no special conditions for safe storage.

7.3 Specific use(s)

The materials are applied as corrosion resistant materials. The material complies with the requirements of Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment and of the Directive 2000/53/EC on end-of-life vehicles: it is free from any additions of the hazardous substances mentioned in both Directives.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

It is known that high temperature processes including production and welding of chromium and chromium-containing alloys can lead to generation of fumes containing chromium(VI). Although the precise identity of the chromium(VI) substances present has not been identified, it is important to recognize that several substances containing chromium(VI) have been classified as carcinogenic, mutagenic, toxic for reproduction and dangerous for the environment. It is therefore essential that workplaces and releases to the environment associated with these activities will be monitored to ensure compliance with national and/or Community legislative limits. Regarding this issue, the users are referred to follow recommendations presented in the paper 'REACH and the Welding of Metals and Alloys', published by Eurometaux, Eurofer and European Welding Association (May 2010).¹

The following limit values are declared for Germany and they refer to dusts, fumes and droplets which arise from treatment and processing of the material. The shortcut "E" stands for the respirable fraction. The shortcut "ASG" stands for the generic dust limit value. However, these data serve only as first information. The current limit values as well as the explanations for the used terms and shortcuts were gathered from the youngest limit values list or the hazardous substances list (source: Institutions for statutory accident insurance and prevention).

Limit values of the components of the alloys and their compounds:

Name of Substance	CAS-N°	Occupational exposure limit (mg/m ³)
Aluminium (as metal)	7429-90-5	ASG
Aluminium oxide and dust of aluminium oxide	1344-28-1	ASG
Chromium and inorganic Chromium(II) und (III)-compounds	7440-47-3	2E
Chromium(VI) compounds except water insoluble compounds, e.g. barium chromate (in form as suspended solids)		0,1E or 0,05E
Cobalt (as cobalt metal, cobalt oxide, cobalt sulfide and dust from alloys containing cobalt)	7440-48-4	
- Manufacturing of cobalt powder and catalysts, Hard metal and magnetic production (powder preparation, swaging and mechanical processing of not sintered work pieces)		0.5 E
Copper and its compounds	7440-50-8	(0,1E)
Iron oxides		
- Iron(II)oxide	1345-25-1	ASG
- Iron(III)oxide	1309-37-1	
Manganese and its inorganic compounds	7439-96-5	0,5 E
Molybdenum and its compounds, insoluble	7439-98-7	ASG
Nickel (metal)	7440-02-0	ASG

¹ Chemical Safety Report Chromium (see references at the end)

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Name of Substance	CAS-N°	Occupational exposure limit (mg/m ³)
Niobium and its compounds, insoluble	7440-03-1	n/a
Titanium dioxide	13463-67-7	ASG
Tungsten and its compounds, insoluble	7440-33-7	ASG

General dust limit value	AGW (mg/m ³)	
	mg/m ³	Peak limit
Respirable/alveolar fraction (A)	3	2(II)
Inhalable fraction (E)	10	2(II)

The peak limit determines the level and duration of exposure. The definition of these short-term values is described in the IFA-Report 1/2013.

8.2 Exposure controls

8.2.1 Exposure controls at the workplace

Personal Protection: The personal protection is depended on concentration and amount of the hazardous material.

Eye/Face Protection: Wear safety goggles in case of the presence of dusts and fumes according to EN 166:2001 (Personal eye-protection).

Hand Protection: Select the type of hand protection according to the kind of work to be done in order to make sure that any mechanical injury be avoided.

Respiratory Protection: In case the element concentration in the air at the workplace is not below the applicable OELs, use breathing filter apparatus class P3.

Skin/Body Protection: Wear protective clothes to avoid direct contact with the material to be handled and to keep off any dust which may develop.

8.2.2 Environmental exposure controls: Avoid the formation of dust.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance

- Aggregate state: Solid (hard metal).

- Colour: Silver grey up to yellow (brass, bronze) or red (Cunifer, Cupronickel, Kuprodur). In special cases, the materials may be delivered to the customer with an oxidised surface of bluish-black colour.

Odour: Not provided.

Odour threshold: Not applicable.

pH: Not applicable.

Melting point/melting range: 1100-1500 °C.

Boiling point/boiling range: Unknown.

Flash point: Non-flammable.

Inflammability: Not applicable.

Upper/lower limit of inflammability or explosion: Not applicable.

Vapour pressure: Unknown.

Vapour density: Not applicable.

Relative density: 7.7 to 8.9 g/cm³ (at 20 °C).

Solubility: nickel metal powder: Insoluble in cold and hot water; massive metal: not applicable.

Partition Coefficient n-octanol / water: Not applicable.

Self-ignition point: Not applicable.

Decomposition temperature: Not applicable.

Viscosity: Not applicable.

Explosive properties: Non-explosive.

Oxidising properties: Non-oxidising.

9.2 Other information

Other physical and chemical properties can be obtained from the material data sheet.

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10. STABILITY AND REACTIVITY

- 10.1 Reactivity/Chemical stability:** Stable and non-reactive under normal ambient atmospheric conditions.
- 10.2 Possibility of hazardous reactions:** Contact with certain acids may result in the release of gaseous acid decomposition products (e.g. hydrogen) and chromium may be released in the form of chromium III. In contact with strong oxidisers at high pH (e.g. alkaline cleaners at pH 10-14), Cr(IV) compounds may form at ambient temperatures.
- 10.3 Conditions to be avoided:** Not applicable.
- 10.4 Incompatible materials:** Oxidising agents.
- 10.5 Hazardous decomposition products:** No dangerous decomposition products are known. Welding fumes, gases and dusts may occur through treatment of the metal.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Because of the different composition of the components in this alloy, it is impossible to determine explicit toxicological values. For this reason, the following part contains only the substances: nickel and chromium.

Remark: The following values refer to metal ions of the pure metal (unless otherwise indicated). The passive oxide layer on the surface of the alloys restricts the release of metal ions. Potential sources of danger are fumes and dusts which can occur through thermal or mechanical treatment of the alloy.

Nickel

Acute toxicity:

Oral: The acute oral toxicity of nickel metal has been determined in a well-performed animal study which concluded the acute oral LD₅₀ was greater than >9000 mg/kg bw/day (LD₅₀(oral)>9000 mg/kg bw/day), LOAEL=0.012 mg Ni/kg/day, (FDRL 1983).

Dermal: No studies have been found on acute toxicity by the dermal route.

Inhalation: Acute inhalation toxicity information is inconclusive due to methodological deficiencies in available studies. However, due to the expected poor absorption of nickel via inhalation of nickel metal, further testing is not considered relevant. NOAEC=10.2 mg Ni/L air; Rat, single dose, 1h, (FDRL, 1985).

Irritation/Corrosivity skin/eye: No relevant or reliable human studies were identified for skin irritation. Not irritating and no concern for corrosive effects.

Sensitisation respiratory tract: The available data are not considered sufficient for classification as a respiratory sensitiser.

Skin sensitisation: May cause sensitisation by skin contact. Nickel is the most commonly diagnosed cause of allergic contact dermatitis worldwide.

Mutagenicity in vitro/in vivo: No reliable in vivo or human studies were identified.

Carcinogenicity: Nickel metal carries a classification as a suspect carcinogen. It is classified as a Category 3, R40 carcinogen under EU Classification & Labelling; Category 2, H351 carcinogen under GHS and CLP; and Group 2B carcinogen (possible human carcinogen) by IARC (1990). These classifications were based on the lack of human evidences of carcinogenicity, but the presence of positive results for tumor induction in animals after injection or intratracheal instillation. Nickel metal has been consistently negative for respiratory carcinogenicity in human studies and was also negative in a recent animal inhalation study (Oller *et al.* 2008).

At the manufacture of nickel from his ores occur nickel sulphides and -oxides which are demonstrable carcinogen in combination. However, it was not possible to identify the cancer-causing agents.

Reproductive toxicity: Data from a reproductive toxicity study with nickel sulphate hexahydrate (SLI, 2000) combined with toxicokinetic data (Ichimatsu *et al.* 1995) provides sufficient justification that metal should not be considered a reproductive toxicant.

Specific target organ toxicity (STOT) – single exposure: No relevant or reliable human studies were identified.

Specific target organ toxicity (STOT) – repeated exposure:

Oral: NOAEL: 2.2mg Ni/kg bw/day (Read across from nickel sulphate hexahydrate, Rat, 2-year study, SLI 2000). Inhalation: LOAEC: 0.1 mg Ni/m³ air (Rat, 2-year study, Oller *et al.* 2008).

Danger of aspiration: No relevant or reliable human studies.

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Chromium

Under normal environmental conditions, chromium-containing alloys (mass concentration >13% chromium) such as stainless steel form a protective, adherent nanometric, oxide film covering the entire surface which prevents the corrosion of the metal. It is well known in metallurgy that chromium and other metals like iron and nickel rapidly oxidise in the air and build a passive oxide layer on the surface. The passive oxide coating is thin enough to affect not the natural brightness of the metal. This coating separates very effectively the metal from the surrounding medium. The layer is continuous, non-porous and insoluble under normal conditions. By any damage (e.g. by scratching) of the passive coating, self-healing mechanisms rebuilt the oxide layer and prevent the material from further oxidation.

Hexavalent chromium compounds can be found in small amounts in highly oxidised fumes during the melting/smelting and pickling stages of the production process and during welding operations. Stainless steel and chromium alloys in massive form do not present a health risk, but welding, cutting, brazing, grinding, etc. may release potentially hazardous fumes or dusts into the air. It is essential that all health and safety precautions be observed when welding and cutting operations are carried out.²

Acute toxicity:

Oral: The acute oral toxicity of chromium(III)oxide has been determined in an animal study (rat) which concluded the acute oral LD₅₀ was greater than >5000 mg/kg bw/day, (LD₅₀(oral)=3400 mg chromium/kg bw/day), (Bayer, 1988).

Dermal: No studies have been found on acute toxicity by the dermal route.

Inhalation: LC₅₀(4h)>5.41 mg/l air (4 hours nose-only inhalation exposure to chromium(III)oxide) (Gaunt, G., 2009).

Irritation/Corrosivity skin/eye: An extensive review of chromium health effects indicates that no skin or eye irritation has been reported due to occupational exposure to chromium metal, chromium(III)oxide or ferrochromium. Not irritating.

Sensitisation respiratory tract: Not sensitising.

Skin sensitisation: Not sensitising.

Mutagenicity in vitro/in vivo: Limited data were available on genotoxicity testing with chromium metal. Therefore read-across to studies using chromium(III)oxide, stainless steel and chromium(III)chloride was applied. Genetic toxicity: negative.

Carcinogenicity: No reliable carcinogenicity studies were available for chromium metal. As the surface of chromium metal is always rapidly oxidised to chromium(III)oxide, the results obtained in studies with this substance can be directly adopted for the metal.

According to available data on in vivo studies with chromium(III)oxide and stainless steel, as well as human exposure data, there are no indications that chromium metal / trivalent chromium would be carcinogen. Several extensive evaluations also conclude that chromium(III)compounds are not classifiable as carcinogens. No Chromium(VI) has been measured in chromium metal release tests.

Reproductive toxicity: NOAEC (fertility impairment; via inhalation): 30 mg chromium(III)/m³ air (chromium(III)oxide; rats) (Derelanko, M. J., W.E. Rinehart, et al., 1999);

NOAEL (fertility impairment; oral): 1368 mg chromium(III)/kg bw/day (chromium(III)oxide; rats); NOAEL (developmental toxicity; oral): 1216 mg chromium(III)/kg bw/day (Ivankovic, S. and R. Preussman, 1975).

Specific target organ toxicity (STOT) – single exposure: No relevant or reliable human studies were identified.

Specific target organ toxicity (STOT) – repeated exposure:

NOAEL (oral): 1368 mg/kg bw/day (chromium(III)oxide; rats), (Ivankovic, S. and R. Preussman, 1975).

LOAEC (inhalation): 3mg/m³ air (chromium(III)oxide; target organ: lung), DNEL: 0,5 mg/ m³ (Derelanko, M. J., W.E. Rinehart, et al., 1999).

Danger of aspiration: No relevant or reliable human studies.

Cobalt

Acute toxicity:

Oral: The toxicological results are inconclusive. Exposure rang: LD₅₀ : 42.4 mg cobalt/kg as cobalt chloride to 317 mg cobalt/kg as cobalt carbonate, (FDRL, 1984; Junnarkar 1991).

Dermal: No studies have been found on acute toxicity by the dermal route.

Inhalation: The toxicological results are inconclusive. Exposure range: 0.015-0.13 mg cobalt/m³ may cause effects in the respiratory tract. LC₅₀= 165 mg cobalt/m³ (30-minute inhalation exposure in rats as cobalt hydrocarbonyl (Palmer et. al, 1959).

² ICDA 2007 (see references at the end)

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Irritation/Corrosivity skin/eye: No relevant or reliable studies were identified.

Sensitisation respiratory tract: Cobalt exposure may result in sensitisation of the respiratory tract or the immune system which may result in asthmatic attacks following inhalation of cobalt in sensitised individuals.

Skin sensitisation: May cause sensitisation by skin contact. A common result of dermal exposure to cobalt in humans is dermatitis.

Mutagenicity in vitro/in vivo: No relevant or reliable studies were identified.

Carcinogenicity/Reproductive toxicity: No relevant or reliable studies were identified.

Specific target organ toxicity (STOT) – single exposure/repeated exposure: No relevant or reliable human studies were identified.

Danger of aspiration: No relevant or reliable human studies.

12. ECOLOGICAL INFORMATION

- 12.1 Toxicity:** Non-hazardous. Nickel, chromium and cobalt metal are solid, compact and not soluble in water.
- 12.2 Persistence and degradability:** For an inorganic substance, biotic degradation in the environment is not a relevant process.
- 12.3 Bioaccumulative potential:** Though nickel does bioaccumulate in aquatic biota, the bioaccumulation factors are generally low and apparently, nickel does not become magnified along food chains (McGeer *et al.* 2003). Chromium is not bioaccumulative.
- 12.4 Mobility in soil:** Chromium is mostly immobile. Nickel and cobalt are mostly mobile. (The mobility is depended on several factors, such as the pH-value: lower pH = higher mobility).
- 12.5 Results of PBT and vPvB assessment:** The PBT and vPvB criteria of Annex XIII to the Regulation do not apply to inorganic substances.
- 12.6 Other adverse effects:** In Germany, nickel metal is classified as water hazard class 2 (except alloys).

13. DISPOSAL CONSIDERATIONS

- 13.1 Valorisation methods:** Nickel and chromium should be recycled.
- Used packaging cleaning, treatment, destruction procedures:** Destruction of packaging in accordance with applicable legislation.
- Relevant EU- or other regulations:** Not applicable.

14. TRANSPORT INFORMATION

- Non-dangerous good according to transport regulations (e.g. ADR)
- 14.1 UN-number:** Not applicable.
- 14.2 Proper shipment label:** Not applicable.
- 14.3 Transport hazard class:** Not applicable.
- 14.4 Packing group:** Not applicable.
- 14.5 Environmental hazards:** Not applicable.
- 14.6 Special precautions for user:** Not applicable.
- 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.

15. REGULATORY INFORMATION

- 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
According to national law.
- 15.2 Chemical safety assessment**
A chemical safety assessment for nickel and chromium has been performed.

Safety Information Sheet (SIS)

Trade Names: Nicorros, Cunifer, Konstantan, Nicrofer, Nimofer, Conicro, Pernifer, Pernima, Magnifer, Cronix, VDM Nickeliron, VDM Nickelmanganese, VDM Nickelchrome, Cupronickel, Nickel Silver, Nickel brass, Aluminium-nickel bronze, Magnimat, Kuprodur, Aeterna, Dental Alloys CoCr with or without additional number and/or letter combinations.



Manufacturer / Supplier: Outokumpu VDM GmbH

revised: 24.05.2013

16. OTHER INFORMATION

References

1. IFA Report 1/2013, List of limit values 2013, Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA), March 2013.
2. IFA Report 1/2012, List of hazardous substances 2012, Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA), Juli 2012.
3. Nickel RRS Draft Final Report, March 2008.
4. European Union Risk Assessment Report Nickel, 30.May 2008, Denmark.
5. Chemical Safety Report Nickel, March 2010.
6. BGI/GUV-I 504-38 March 2009 .
7. Bundesgesundheitsblatt Gesundheitsforschung und Gesundheitsschutz 44 (2001) 12, 1243-1248.
8. Chemical Safety Report Chromium, Finnish Institute of Occupational Health, September 2010.
9. Health Safety and Environment Guidelines for Chromium, 2007, ICDA.
10. Agency for Toxic Substances Disease Registry (ATSDR), 2002; CICAD 69 (Concise International Chemical Assessment Documents).
11. GESTIS-database on hazardous substances, Information system on hazardous substances of the German Social Accident Insurance.
12. European Chemical Substances Information System, European Commission Joint Research Centre.

Regulations

Directive 2000/53/EC	Directive 2002/95/EC	Regulation (EC) N° 1907/2006 (REACH Regulation)
Directive 2008/58/EC	Directive 67/548/EEC	Regulation (EU) N° 453/2010
Regulation (EC) N° 1272/2008 (CLP Regulation)		Regulation (EG) N° 790/2009 (1.ATP of the CLP Regulation)
VwVwS 2005 (Regulation on the Classification of Substances hazardous to waters into Water Hazard Classes)		

List of Acronyms

ADR – European Agreement concerning the International Carriage of Dangerous Goods by Road
ASG – “Allgemeiner Staubgrenzwert“(generic dust limit value)
BAT – Biological tolerance values
BGI – Institute of Occupational Safety and Health
Bw – Bodyweight
Carc. –Carcinogenicity
Cat. – Category
CLP – Regulation on Classification, Labelling and Packaging of Substances and Mixtures (EU)
FDRL – Food and Drug Research Laboratory
GHS – Globally Harmonized System of Classification, Labelling and Packaging of Chemicals
GUV – Statutory accident insurance
LD₅₀ – Median lethal dose (Dose at which 50% of subjects will die)
LOAEC – Lowest Observed Adverse Effect Concentration (lowest concentration which causes an harmful effects)
LOAEL – Lowest Observed Adverse Effect Level (lowest dose which causes an harmful effects)
MAK – Maximum concentration of a chemical substance in the workplace
N – Dangerous for the environment
NOAEC – No Observed Adverse Effect Concentration (maximum concentration that causes no harmful effects)
NOAEL – No Observed Adverse Effect Level (maximum dose that causes no harmful effects)
OEL – Occupational exposure limits
SLI – Springborn Laboratories, Inc., Spencerville, Ohio
STOT rep. exp. – Specific target organ toxicity - repeated exposure
TRGS – Technical Rules of Hazardous Substances
TRK – Technical guidance concentrations

The information herein is given to the best of our knowledge concerning the substance indicated in the date in which it was updated. Information is provided in good faith. Outokumpu-VDM GmbH does not give any assurance with the view of completeness and validity. This Safety Information Sheet serves only as guideline for adequate handling of the material by an educated person. According to that Outokumpu-VDM GmbH is not responsible for damages which may occur through application or faith of the data listed.