

UDDEHOLMS AB SAFETY DATA SHEET

Alloys delivered from UDDEHOLM except Vanadis 30 and 60

Issued: 2010-01-04

Revised: 2012-12-05

Page: 1 (8)

1. COMPANY AND PRODUCT INFORMATION

1.1 Product identifier

Alloys delivered from Uddeholms AB

1.2 Relevant identified uses of the substance or mixture and uses advised against

Metal alloys for further processing

1.3 Details of the supplier of the safety data sheet

Manufacturer
UDDEHOLMS AB
S-683 85 HAGFORS
Sweden
Tel.: +46 563 170 00
Fax: +46 563 174 61
web: www.uddeholm.com

Contact: Lars Sundström. E-mail: lars.sundstrom@uddeholm.se

Roland Edvinsson. E-mail: roland.edvinsson@uddeholm.se

1.4 Emergency telephone number

Emergency phone number: 112

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Alloys containing nickel are classified for skin sensitisation only when the release rate is minimum 0.5µg Ni/cm²/week.

2.2. Label elements

Alloys in massive form do not require labelling under current chemical product classification and labelling regulations, if they are not classified as hazardous to health and environment

2.3. Other hazards

Processes which generate particulates from the working of alloys can cause hazards to health or environmental effects. May cause an allergic reaction on contact with skin or by inhalation. The alloys do not meet the criteria for PBT or vPvB in accordance with Annex XII.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

Alloys are considered as special preparations only when they are remelted, otherwise they are classified as articles. For information on each substance in the alloys, see text below.

3.2 Mixture

The substances in the special mixture are as follows:

Ingredient	EINICS-number CAS-number Index-number	Symbols (CLP)	Hazard statements* (CLP)	Symbols (EG-class.)	Risk Phrases (EG-class.)*	Concentration (weight %)
Iron (Fe)	231-096-4 7439-89-6 -	GHS02 Danger	H242	O	R7	>55 %

UDDEHOLMS AB SAFETY DATA SHEET

Alloys delivered from UDDEHOLM except Vanadis 30 and 60

Issued: 2010-01-04

Revised: 2012-12-05

Page: 2 (8)

Chromium (Cr)	231-157-5 7440-47-3 -	GHS06 GHS09 Danger	H301 H311 H410	T+	R27/28 - 50/53 - 67	0-20%
Cobalt (Co)	231-158-0 7440-48-4 027-001-00-9	-	-	-	-	0-1 %
Vanadium (V)	231-171-1 7440-62-2 -	GHS07 Warning	H315 H319 H335	-	-	0-12 %
Molybdenum (Mo)	231-107-2 7439-98-7 -	-	-	F	R11	0-10 %
Nickel (Ni)	231-111-4 7440-02-0 028-002-00-7	GHS08 Danger	H317 H351 H373	Xn	R40-43- 48/23	0-10%
Tungsten (W)	231-143-9 7440-33-7 -	-	-	-	-	0-10 %
Carbon (C)	231-153-3 7440-44-0 -	GHS02 GHS07 Danger	H250 H335	F	R17	0-5 %
Manganese (Mn)	231-105-1 7439-96-5 -	GHS09	H411	N	R51/53	0-5 %
Aluminium (Al)	231-072-3 7429-90-5 013-001-00-6	GHS02 Danger	H228 H261	F	R11-15	0-2 %
Copper (Cu)	231-159-6 7440-50-8 -	GHS09 Warning	H410	N	R50/53	0-1 %

*For complete wording of R-phrases and hazard statements see section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

Show this safety data sheet to the doctor on duty.

4.1.1. Relevant routes of exposure

Inhalation

If dust, fumes or mist inhaled, remove patient to fresh air, allow to rest and keep warm.

Skin contact

Immediately remove any metal fragments or pieces that get under the skin. Wash well with plenty of soap and water following any contact with metal particles. Remove any contaminated clothing and launder before reuse. Seek medical attention if irritation develops.

Eye contact

Avoid getting finely divided particles in the eyes. Flush immediately with plenty of luke-warm water, keeping eyelids open. Seek medical attention if symptoms persist.

UDDEHOLMS AB SAFETY DATA SHEET

Alloys delivered from UDDEHOLM except Vanadis 30 and 60

Issued: 2010-01-04

Revised: 2012-12-05

Page: 3 (8)

Ingestion

Alloys in massive form are not hazardous, but should be kept out of the mouth. Finely divided particles may be easily ingested along with food, drink or smoking. If large quantities ingested, seek medical advice.

4.2. Most important symptoms and effects

The alloys in themselves or particles from the alloy are not judged as acute toxic. From the medical point of view, there is no evidence to indicate an absolute or a sharp distinction between harmful and non harmful content. An average content in the air of a single substance at the level of the limit considered, with current knowledge, generally not present any risk of injury or discomfort. It is nevertheless important to strive to keep all air pollutants as low as possible during the exposure limit. A particularly important situation is that if someone is exposed to multiple air pollutants simultaneously or exposed to air pollution related to heavy work. Keep dust levels below the limits mentioned in section 8.1.

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

There is no indication of immediate medical attention or special treatment documented for the alloys.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Where metal dust or powder is involved, cover with dry sand, chemical powder, or other dry inert material to minimise the risk of explosion. DO NOT use water.

5.2. Special hazards arising from the substance or mixture

Finely divided iron can explode in contact with air. Solid iron will react with oxidising materials, fluorine, chlorine, chlorine trifluoride, hydrogen peroxide, etc. Finely divided chromium can explode in contact with air. Solid will react with bromine pentafluoride. Finely divided chromium will react with carbon dioxide, nitrogen oxides, sulphur dioxide. Finely divided molybdenum will react with bromine trifluoride, fluorine, bromine pentafluoride, chlorine trioxide. Finely divided manganese will react with aluminium powder, sulphur dioxide, carbon dioxide, fluorine, chlorine, hydrogen peroxide and nitric acid.

5.3. Advice for fire-fighter

Use ordinary safety equipment.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Not applicable to solid metal/alloys in massive form. In particulate form, wear personal protective equipment as specified in Section 8. Avoid contact with the skin. Do not inhale dust.

6.2. Environmental precautions

Collect powder using a vacuum cleaner or by gentle sweeping to keep dust away from drains, surface and ground water. Prevent particulates from entering watercourses or drains. Avoid formation of dust clouds.

6.3. Methods and material for containment and cleaning up

Collect powder using a vacuum cleaner or by gentle sweeping.

UDDEHOLMS AB SAFETY DATA SHEET

Alloys delivered from UDDEHOLM except Vanadis 30 and 60

Issued: 2010-01-04

Revised: 2012-12-05

Page: 4 (8)

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

No special precautions necessary for alloys in massive form other than normal physical handling techniques. Extraction should be used when working with particulate material (dust, fumes, mist). Avoid prolonged inhalation of dust. Wear gloves to avoid contact with skin (see Section 8). Working areas should be provided with extraction. Factories should be kept clean to avoid any unnecessary contamination.

Do not to eat, drink and smoke in work areas and wash hands/shower when leaving the working areas.

7.2. Conditions for safe storage, including any incompatibilities

Store in a dry environment.

7.3. Specific end use(s)

See section 13.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

All over 8 hour period unless otherwise stated. Monitoring procedures are not required.

Chromium	UK	WEL	0.5mg/m ³	total
	Sweden	NGV	0.5mg/m ³	total
Cobalt	UK	WEL	0.1mg/m ³	8hr TWA
	Sweden	NGV	0.02mg/m ³	total
Molybdenum	UK	WEL	None set	
	Sweden	NGV	10mg/m ³	total
Nickel			5mg/m ³	respirable
	UK	WEL	0.5mg/m ³	total
Tungsten	Sweden	NGV	0.5mg/m ³	total
	UK	WEL	5mg/m ³	total
Carbon			10mg/m ³	total (15min)
	Sweden	NGV	5mg/m ³	total
Manganese	Sweden	NGV	3 mg/m ³	total
	UK	WEL	0.5mg/m ³	total
Aluminium	Sweden	NGV	0.2mg/m ³	total
			0.1mg/m ³	respirable
Copper	UK	WEL	10mg/m ³	8hr TWA
			4mg/m ³	15min
	Sweden	NGV	5mg/m ³	total
			2mg/m ³	respirable
	UK	WEL	0.2mg/m ³	fume
			1mg/m ³	dusts and mist
	Sweden	NGV	1mg/m ³	total
		NGV	0.2 mg/ m ³	respirable

8.2 Exposure control

Always check the applicability of any protective equipment with your supplier.

8.2.1 Eye/face protection

Always wear eye protection when handling dusts and other particulates, eg safety glasses with side protection, safety goggles or visor

UDDEHOLMS AB SAFETY DATA SHEET

Alloys delivered from UDDEHOLM except Vanadis 30 and 60

Issued: 2010-01-04

Revised: 2012-12-05

Page: 5 (8)

8.2.2 Skin protection

Always wear protective clothing when handling dusts and other particulate

8.2.3 Hand protection

Wear hand protection, eg leather gloves when handling alloys with sharp edges to avoid cuts. Always wear disposable nitrile or vinyl gloves when handling particulate material to avoid skin contact. Where necessary wear the disposable gloves under work gloves to protect against both types of hazard.

8.2.4 Respiratory protection

Alloys in delivered in solid form give no health risk through inhalation. Extraction should be used when working with particulate material (dust, fumes, mist). In case of prolonged or frequent exposure to particulates, wear particle filter mask (P3).

8.2.5 General hygiene measures

Wash hands well with soap and water after handling dusty materials. Wash contaminated clothing to avoid secondary contamination or contamination of other personnel.

8.2.6 Thermal hazards

Ensure adequate ventilation to keep levels of air-borne particles below occupational exposure limits given above. Working areas should be provided with extraction. Factories should be kept clean to avoid any unnecessary contamination.

8.2.3 Environmental exposure control

Avoid letting dust and fumes entering the outside air.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance: Metallic, alloy in massive form

Odour: Odourless

Melting point / freezing point: 1200 -1500°C

Vapour density: 7.8 kg/dm³

Note: These are typical values and do not constitute a specification.

9.2. Other information

No other physical or chemical parameters are necessary for the alloys.

10. STABILITY AND REACTIVITY

10.1. Reactivity

Alloys are stable. Any reaction should not take place under normal circumstances.

10.2. Chemical stability

Alloys are stable. Corrosion should not take place under normal circumstances.

10.3. Possibility of hazardous reactions

See section 5.2.

10.4. Conditions to avoid

No special conditions need to be avoided for the alloys, however keep dust and fumes from entering the environment.

10.5. Incompatible materials

Contact with acids can generate explosive gasses, eg hydrogen.

10.6. Hazardous decomposition products

The alloys are stable.

UDDEHOLMS AB SAFETY DATA SHEET

Alloys delivered from UDDEHOLM except Vanadis 30 and 60

Issued: 2010-01-04

Revised: 2012-12-05

Page: 6 (8)

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Alloys contain nickel and cobalt which carry a risk of producing an allergic reaction following prolonged contact or in already sensitised persons. No further toxicological data available for the alloys. See below for LD50 or LC50 for the individual substances, since no LC50 or LD50 has been established for the mixture as a whole. (No LD50 or LC50 is available for tungsten.)

Chromium - Oral LD ₅₀ rat	19.8 mg/kg bodyweight	(highly toxic)
Cobalt- Oral LD ₅₀ rat	1500 mg/kg bodyweight	(toxic)
Nickel- Oral LD ₅₀ rat	>5000 mg/kg bodyweight	
Manganese- Oral LD ₅₀ rat	9000 mg/kg bodyweight	
Carbon- Oral LD ₅₀ rat	>10000 mg/kg bodyweight	
Iron - Oral LD ₅₀ rat	30000 mg/kg bodyweight	(not harmful)
Copper- LC ₅₀ Fish 96h	0,017 mg/l, species: Oncorhynchus mykiss (copper ion)	
Vanadium- LC ₅₀ Fish 96h	0,17 mg/l	
Aluminium- LC ₅₀ Fish 96h	>100 mg/l	
Molybden- Fish LC50 96h	2600 mg/l (molybdat)	

12. ECOLOGICAL INFORMATION

12.1. Toxicity

Alloys contain metals which are considered to be very toxic towards aquatic organisms. Finely divided alloys are therefore considered harmful to aquatic organisms.

12.2. Persistence and degradability

The alloys consist of elements that can not degrade any further in the environment.

12.3. Bioaccumulative potential

Alloys contain heavy metals which bioaccumulate in the food chain. The following figures are the bioconcentration factor (BCF) for the substances on their own (molybdenum, tungsten and carbon do not have a BCF):

Iron, BCF: 140000

Chromim, BCF: 200

Cobalt, BCF: 4000

Vanadium, BCF: 2

Nickel, BCF: 16

Carbon, BCF: 0,14

Manganese, BCF: 59052

Aluminium, BCF: 18

Copper, BCF: 29

12.4. Mobility in soil

Metal alloys are not soluble in water or soil. Particles formed by working alloys can be transported in the air.

12.5. Results of PBT and vPvB assessment

No chemical safety report is required for the alloys, however neither the alloys in itself or the substances that it consist of, meet the criteria for PBT or vPvB in accordance with REACH, Annex XII.

12.6. Other adverse effects

In massive form alloys present no hazards to the aquatic environment. Particles and ions can, never the less, enter the aquatic compartment by means of dusts or smoke, or by liberation due to erosion thereby introducing iron or heavy metals into the ground or water.

UDDEHOLMS AB SAFETY DATA SHEET

Alloys delivered from UDDEHOLM except Vanadis 30 and 60

Issued: 2010-01-04

Revised: 2012-12-05

Page: 7 (8)

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Non-contaminated waste from the production and pure-grade- alloys are recyclable. The unused product (massive alloy) is not classified as hazardous waste. Dispose in accordance with appropriate government regulations. Any residues of finely divided product (particles, dust, fumes) are regarded as Hazardous Waste. Contact your local entrepreneur for advice.

14. TRANSPORT INFORMATION

14.1. UN number

Alloys in massive form are not classified as dangerous goods for transport and has no UN number.

14.2. UN proper shipping name

Alloys in massive form are not classified as dangerous goods for transport and has no UN proper shipping name

14.3. Transport hazard class(es)

Alloys in massive form are not classified as dangerous goods for transport.

14.4. Packing group

There are not any special precautions with which a user should or must comply or be aware of in connection with transport or conveyance either within or outside his premises.

14.5. Environmental hazards

The alloys are not environmentally hazardous according to the criteria of the UN Model Regulations (as reflected in the IMDG Code, ADR, RID and ADN) and/or a marine pollutant according to the IMDG Code.

14.6. Special precautions for user

There are not any special precautions which a user should or must comply or be aware of in connection with transport or conveyance either within or outside his premises of the alloys.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Alloys in massive form do not subject under MARPOL73/78 and the IBC Code.

15. REGULATORY INFORMATION

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

Prepared according to EU Directives 1907/2006 (REACH) & 1272/2008 (CLP). Classifications mentioned in table 3.2 concerns substances in their crushed form. Alloys in massive form do not require labelling under current chemical product classification and labelling regulations, if they are not classified as hazardous to health and environment. Contains nickel and cobalt. Alloys in particulate form eg dust, fumes, mist may cause an allergic reaction on contact with skin or if inhaled.

15.2. Chemical Safety Assessment

No chemical safety assessment has been carried out for the product.

16. OTHER INFORMATION

16.1 Modifications since previous version

Version 2: name change of company

The information has been updated in sections.

Version 3: In this MSDS the alloys Vanadis 30 and 60 has been excluded due to their Cobalt content (>1%). This MSDS is relevant for all alloys delivered from Uddeholms AB except Vanadis 30 and 60. There has also been an update in the classification in section 3.2, in the OEL (Occupational Exposure Limit) in section 8.1 and on topological data in section 11.1.

UDDEHOLMS AB SAFETY DATA SHEET

Alloys delivered from UDDEHOLM except Vanadis 30 and 60

Issued: 2010-01-04

Revised: 2012-12-05

Page: 8 (8)

Key literature references and sources for data

Study overview made for the first editions of the individual safety data sheets were constructed by Amasis Konsult AB. For this version has <http://kemi.prevent.se/> (a chemical substances database which is a compilation of data from numerous sources) been used for information on individual substances.

Full text of R-phrases used in Section 3

R7	May cause fire
R11	Highly flammable
R15	Contact with water liberates extremely flammable gases
R17	Spontaneously flammable in air
R27/28	Very toxic in contact with skin and if swallowed
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 through inhalation
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R67	Vapours may cause drowsiness and dizziness

Full text of Hazard statements used in Section 3

H228	Flammable solid substance
H242	Heating may cause fire
H250	Catches fire spontaneously if exposed to air
H261	Contact with water generates flammable gases
H301	Toxic if swallowed
H311	Toxic in contact with skin
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H335	May cause respiratory irritation
H351	Suspected of causing cancer
H373	May cause damage to organs by long-term or repeated exposure
H410	Very toxic to aquatic life with long lasting effects
H411	Toxic to aquatic life with long lasting effects

This information is in addition to any existing information. Users must ensure that the information is adequate for their purposes. For any further information, please contact:

UDDEHOLMS AB
S-683 85 HAGFORS
Sweden

Tel.: +46 563 170 00
Fax: +46 563 174 61
web: www.uddeholm.com