

UDDEHOLMS AB SAFETY DATA SHEET

CALDIE WELD, CALMAX/CARMO WELD, IMPAX WELD & QRO 90 WELD

Issued: 2010-01-13

Revised: 2010-08-08

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1. COMPANY AND PRODUCT INFORMATION

- 1.1 Identification of the substance/preparation
Welding electrodes: CALDIE WELD, CALMAX/CARMO WELD, IMPAX WELD & QRO 90 WELD
- 1.2 Use of the substance/preparation
Electrodes for use as welding filler material
- 1.3 Company Identification

Supplier	Manufacturer
UDDEHOLMS AB S-683 85 HAGFORS Sweden Phone: +46 563 170 00 Fax: +46 563 174 61 Internet: www.uddeholm.com Contact: Lars Sundström. E-mail: lars.sundstrom@uddeholm.se	UTP Schweißmaterial GmbH Elsässer Straße 10 D-79189 Bad Krozingen Phone: +49 7633 409 01 Fax: +49 7633 409 227 info@utp.de Contact: QS department

- 1.4 Emergency telephone number
Emergency phone number: 112

2. HAZARDS IDENTIFICATION

- 2.1. Classification of the substance or mixture
Welding electrodes do not require labelling under current chemical product classification and labelling regulations. Welding electrodes and wires are non-hazardous solids at ambient temperature.
- 2.2. Label elements
Welding electrodes, do not require labelling under current chemical product classification and labelling regulations.
- 2.3. Other hazards
The welding electrodes do not meet the criteria for PBT or vPvB in accordance with Annex XIII.

General: Different kinds of fume and dust occur during the welding and grinding process. Chromium-VI compounds and nickel oxides might occur, which are classified as carcinogenic. In addition irritant substances such as fluorides and manganese oxides as well as fine dusts (mostly iron oxides) occur. Health Hazards (acute and chronic) Welding electrodes and wires are non-hazardous solids at ambient temperature. Actual exposure should be determined by monitoring the fume in the operator's breathing zone. Compounds of chromium and nickel in the fume should be considered possible carcinogens per OSHA29. CFR 1910. 1200. No clear association, however, has been established between Cr and Ni in welding fume and the development of cancer. Short term overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat or eyes and may aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death. Long term overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. The primary entry route for welding fumes and gases is by inhalation. Bronchitis and some lung fibrosis have been reported. Repeated exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. May cause skin rash. Overexposure to hexavalent chromium and nickel present in welding fume can present the risk of lung cancer, asthma and damage to the nose and skin. Arc rays can injure eyes and burn skin. Electric shock can kill. Before use, read and understand the manufacturer's instructions, MSDS's and your employer's safety practices. Keep your head out of the fumes. Use enough ventilation, exhaust at the arc, or both, to keep fumes and gases

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from your breathing zone and the general area. Wear correct eye, ear and body protection. Do not touch live electrical parts. See American National Standard Z49.1, and OSHA Safety and Health Standards.

Carcinogenicity

Nickel: The International Agency for Research on Cancer indicates nickel refining and "certain nickel compounds" were cancer-causing, but could not state with certainty which forms of nickel may be carcinogenic. The National Toxicology Program lists nickel powder, nickel subsulfide, nickel oxide, nickel carbonate, nickel carbonyl and nickelocene as substances "that may reasonably anticipated to be carcinogens". Because of this, the OSHA Hazard Communication Standard requires that everyone who manufactures or imports these substances or mixtures or alloys containing these substances must warn of a cancer hazard on their MSDS's and labels. This warning is mandated by OSHA even though studies have not demonstrated cancer risks associated with the use of nickel. Intramuscular injection and implantation of nickel powder produced localized tumors in rats and mice. Inhalation studies using animals showed no evidence of carcinogenicity.

Chromium: The International Agency for Research on Cancer and the National Toxicology Program indicates there is sufficient evidence for carcinogenicity of Chromium compounds both in humans and experimental animals. IARC notes that "the compounds responsible for the carcinogenic effect in humans cannot be specified". Studies with chromium metal and trivalent forms of chromium compounds have shown inadequate evidence for carcinogenicity in both animals and humans.

Crystalline silica: The National Toxicology Program indicates there is sufficient evidence for the carcinogenicity or respirable crystalline silica in experimental animals. Increases in incidence of lung cancers have been found in inhalation studies in rats. An IARC working group reported there is limited evidence for the carcinogenicity of crystalline silica in humans.

Other precautions: Electric shock from arc welding equipment can kill. When welding arc or torch flame may be a source of ignition of combustible.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

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 %)
Calcium fluoride	232-188-7 7789-75-5 009-	GHS07 Warning	H315 H319 H335	Xi	26, 36/37/38	2,5-10%
Titanium dioxide	236-675-5 13463-67-7 008-					≤2,5-10%
Silicic acid, sodium salt	215-687-4 1344-09-8 014-	GHS05 Danger	H315 H318	Xi	R41, 38	2,5-10%
Molybdenum (Mo)	231-107-2 7439-98-7 -	GHS02 GHS09 Danger Warning	H225 H400	F, N	R11-50	≤2,5%
Manganese	231-105-1 7439-96-5 025-	GHS07 GHS09 Warning	H332 H410	Xn, N, F	R 11, 20, 50 53	0-≤2,5%

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

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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.

Ingestion

Welding electrodes 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 welding electrodes in themselves or particles from the electrodes 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 electrodes.

5. FIRE-FIGHTING MEASURES

5.1.1 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

According to MSDS supplied by manufacturer, there are no special hazards arising from the welding electrodes

5.3. Advice for fire-fighter

Use ordinary safety equipment. Do not inhale explosion gases or combustion gases.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Not applicable to solid metal/welding electrodes. Do not inhale dust.

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6.2. Environmental precautions

Do not allow to enter sewers/ surface or ground water. 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. Pick up mechanically. No dangerous substances are released.

6.4. Reference to other sections

See also section 8.2.7.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

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. No special precautions necessary for solid electrodes other than normal physical handling techniques. Prevent formation of dust. Extraction should be used when working with particulate material (dust, fumes, mist). Avoid prolonged inhalation of dust.

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

Ingredients with limit values that require monitoring at the workplace:

7789-75-5 calcium fluoride

AGW (Germany) 2,5E mg/m³,2(II);als Fluor berechnet; DFG

13463-67-7 titanium dioxide

AGW (Germany) 3* 10** mg/m³,2(II);*alveolengängige **einatebare Fraktion; AGS

7439-96-5 manganese

AGW (Germany) 0,5E mg/m³, DFG,Y,10

Additional information: The lists valid during the making were used as basis.

Manganese	UK	WEL	0.5mg/m ³	total
	Sweden	NGV	0.2mg/m ³	total
				0.1mg/m ³
Molybdenum	UK	WEL	None set	
	Sweden	NGV	10mg/m ³	total
				5mg/m ³
Titanium dioxide	Sweden	NGV	5mg/m ³	total

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

8.2 Exposure control

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

8.2.1 Eye/face protection

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

8.2.2 Skin protection

Always wear protective clothing when handling dusts and other particulates.

8.2.3 Hand protection

Wear hand protection, eg leather gloves when handling electrodes 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

Welding electrodes 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.

8.2.7 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

Form: Solid

Colour: Grey

Odour: Odourless

Self-igniting: Product is not selfigniting.

Danger of explosion: Product does not present an explosion hazard.

Solubility in / Miscibility with water: Insoluble.

9.2. Other information

No other physical or chemical parameters are necessary for the welding products.

10. STABILITY AND REACTIVITY

10.1. Reactivity

No dangerous reactions known.

10.2. Chemical stability

Welding electrodes 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 decomposition if used according to specifications, however keep dust and fumes from entering the environment.

10.5. Incompatible materials

No dangerous reactions known for the welding electrodes.

10.6. Hazardous decomposition products

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, and the process, procedures, and electrodes used. Other conditions which also influence the

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composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, galvanising, or phosphate coatings on steels which would produce phosphine gas), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapours from cleaning and degreasing activities which may be decomposed by the arc into toxic gases such as phosgene). When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in SECTION II. Fume and gas decomposition products, and not the ingredients in the electrode are important. The concentration of a given fume or gas component may decrease or increase by many times the original concentration in the electrode. Also, new compounds not in the electrodes may form. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in SECTION II, plus those from the base metal and coating, etc..., as noted above. Reasonably expected fume constituents of this product would include: Example for Carbon dioxide shielded flux-cored electrode (AWS 5.20 E70-T-1):

Reasonably expected fume constituents of this product would include: primarily oxides of Iron; secondarily complex oxides of Manganese, Silicon, Titanium and Sodium. The present ACGIH TLV for Manganese, 0.2 mg/m³ will result in a significant reduction from the 5 mg/m³ general welding fume (NOC) level. Example for Stainless Steel covered electrodes (AWS 5.4): Reasonably expected fume constituents of this product would include: primarily fluorides and complex oxides of Iron and Silicon, secondarily complex oxides of Manganese, titanium, chromium, nickel, sodium and potassium. The present 1995 OSHA PEL (Permissible Exposure Limit) for hexavalent Chromium (Cr +6) is 0.05 mg/ m³ which will result in a significant reduction from the 5 mg/m³ general welding fume (NOC) level. The limit of 0.05 mg/m³ for hexavalent chromium from the decomposition products in these electrodes comes from the limit shown at the bottom of OSHA Table Z-2, which is for 0.1 mg of CrO₃- which calculates to 0.05 mg of Cr+6/m³. It applies to soluble chromates of the types found in covered stainless electrode fumes. Reasonably expected gaseous constituents would include Carbon monoxide and Carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample from inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1 and ANSI/AWS F1.2-1992

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

See below for LD₅₀ or LC₅₀ for the individual substances, since no LC₅₀ or LD₅₀ has been established for the mixture as a whole.

Manganese- Oral LD₅₀ rat 9000 mg/kg bodyweight

Molybden- Fish LC₅₀ 96h 2600 mg/l (molybdat)

Primary irritant effect on the skin: No irritant effect.

Primary irritant effect on the eye: No irritating effect.

Sensitization: Sensitization possible through skin contact

Additional toxicological information

Workers exposed to hexavalent chrome (Cr+6) are at an increased risk of developing lung cancer. It also possible that occupational exposure to (Cr+6) may result in asthma, and damage to the nasal epithelia and skin. To avoid any risk follow the requirements of the OSHA rule for hexavalent chromium published on February 28, 2006 in the U.S. Federal Register, pages:10099-10385 which established an 8-hour time-weighted average (TWA) exposure limit of 5 micrograms of hexavalent chrome per cubic meter of air (5 µg/m³). This is a considerable reduction from the previous PEL of 1 milligram per 10 cubic meters of air (1 mg/10 m³, or 100 µg/m³) reported as CrO₃, which is equivalent to a limit of 52 µg/m³ as (Cr+6)). This rule also contains ancillary provisions for worker protection such as requirements for exposure determination, preferred exposure control methods, including a compliance alternative for a small sector for which the new PEL is infeasible, respiratory protection, protective clothing and equipment, hygiene areas and practices, medical surveillance, recordkeeping, and start-up dates that include four years for the implementation of engineering controls to meet the PEL.

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12. ECOLOGICAL INFORMATION

12.1. Toxicity

Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water. (Exception: Caldie Weld which is generally not hazardous for water.)

12.2. Persistence and degradability

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

12.3. Bioaccumulative potential

The following figures are the bioconcentration factor (BCF) for the substances on their own (molybdenum do not have a BCF):

Manganese, BCF: 59052

12.4. Mobility in soil

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

12.5. Results of PBT and vPvB assessment

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

12.6. Other adverse effects

In massive form electrodes 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.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Dispose in accordance with appropriate government regulations.

European waste catalogue:

12 01 13 welding wastes

12 01 20 spent grinding bodies and grinding materials containing dangerous substances

Recommendation: Disposal must be made according to official regulations.

14. TRANSPORT INFORMATION

14.1. UN number

Welding electrodes are not classified as dangerous goods for transport and has no UN number.

14.2. UN proper shipping name

Welding electrodes are not classified as dangerous goods for transport and has no UN proper shipping name

14.3. Transport hazard class(es)

Welding electrodes 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 welding electrodes 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.

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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 welding electrodes.

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

Welding electrodes 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. Welding electrodes do not require labelling under current chemical product classification and labelling regulations. The product is not subject to identification regulations under EU Directives and the Ordinance on Hazardous Materials (German GefStoffV).

National regulations: Water hazard class 1 (Self-assessment): slightly hazardous for water. (Exception: Caldie Weld which is generally not hazardous for water.)

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.

Key literature references and sources for data

This information is based on the manufacturer's MSDS and European laws. Department issuing MSDS at UTP: QS department, contact: Herr Wangler. Contact supplier for detailed reports of sources.

Full text of R-phrases used in Section 3

R11	Highly flammable
R20	Harmful by inhalation
R26	Very toxic by inhalation
R36/37/38	Irritating to eyes, respiratory system and skin
R38	Irritating to skin
R41	Risk of serious damage to eyes
R50	Very toxic to aquatic organisms
R53	May cause long-term adverse effects in the aquatic environment

Full text of Hazard statements used in Section 3

H225	Highly flammable liquid and vapour
H315	Causes skin irritation
H318	Causes serious eye damage
H319	Causes serious eye irritation
H332	Harmful if inhaled
H335	May cause respiratory irritation
H410	Very 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:

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