



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

1.1 Product designation

Welding Electrodes: CALMAX/CARMO WELD, IMPAX WELD & QRO 90 WELD

1.2 Identified uses of the substance/mixture

Shielded Metal Arc Welding Electrode

1.3 Further information on the company/undertaking

Manufacturer: Uddeholms AB

Address: Uvedsvägen 15
SE-683 85 Hagfors
SWEDEN

Contact: Hse@uddeholm.com

1.5 Emergency telephone number

In acute emergencies: Call 911!

SECTION 2: Hazards Identification

2.1 Classification of the substance/mixture

Classified according to the criteria of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), OSHA Hazard Communication Standard (29 CFR 1910.1200) and the Canadian Controlled Products Regulations.

The Product does not meet the criteria for classification in any hazard class according to GHS.

2.2 Label elements

GHS label elements: Void

Hazard pictograms: Void

Signal Word: Void

Hazard Statements: Void

NFPA ratings (Scale 0-4)



Health = 1
Fire = 0
Reactivity = 0

HMIS ratings (Scale 0-4)

HEALTH	0
FIRE	0
REACTIVITY	0

Health = 0
Fire = 0
Reactivity = 0

2.3 Other hazards:

Results of PBT and vPvB assessment




PBT: Not applicable

vPvB: Not applicable

SECTION 3: Composition/information on ingredients

3.1 Chemical characterization/Mixtures

Mixture of the substances listed below with nonhazardous additions.

Dangerous Components:			
CAS: 13463-67-7 EINECS: 236-675-5	Titanium dioxide	 Carc. 2, H351	5-12 %
CAS: 1344-09-8 EINECS: 215-687-4	Silicic acid, Sodium salt	  STOT SE 3, H335	5-12,5 %
CAS: 7789-75-5 EINECS: 232-188-7	Calcium flouride	-	5-12,5 %
CAS: 7439-96-5 EINECS: 231-105-1	Manganese	-	0,1-2,5 %
CAS: 7439-98-7 EINECS: 231-107-2	Molybdenum	-	0,1-2,5 %

SECTION 4: First-aid measures

4.1 Description of first aid measures

General information: No special measures required.

After inhalation: Supply fresh air; consult doctor in case of complaints.

After skin contact: Generally the product does not irritate the skin.

After eye contact: Rinse opened eye for several minutes under running water.

After swallowing: Seek medical treatment.

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: Fire-fighting measures

5.1 Extinguishing agents

Suitable extinguishing agents: Suitable to surrounding conditions

5.2 Special hazards arising from the substance or mixture

No further relevant information available.

5.3 Advice for firefighters

Protective equipment: No special measures required.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation.

Use respiratory protective device against the effects of fumes/dust/aerosol.

6.2 Environmental precautions

Do not allow to enter sewers/ surface or ground water.

6.3 Methods and material for containment and cleaning up

Pick up mechanically.

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

Ensure that suitable extractors are available on processing machines.

7.2 Information about protection against explosions and fires

No special measures required.

7.2 Conditions for safe storage, including any incompatibilities

Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility: Not required.

7.3 Specific end use(s)

No further relevant information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with limit values that require monitoring at the workplace:

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.

At this time, the remaining constituent has no known exposure limits.

CAS: 13463-67-7 Titanium dioxide	
PEL	Long-term value: 15* mg/m ³ *total dust
REL	See Pocket Guide App. A
TLV	Long-term value: 10 mg/m ³ withdrawn from NIC
CAS: 7789-75-5 Calcium flouride	
PEL	Long-term value: 2.5 mg/m ³ as F
REL	Long-term value: 2.5 mg/m ³ as F
TLV	Long-term value: 2.5 mg/m ³ as F, BEI
CAS: 7439-96-5 Manganese	
PEL	Ceiling limit value: 5 mg/m ³ as Mn
REL	Short-term value: 3 mg/m ³ Long-term value: 1 mg/m ³ fume, as Mn
TLV	Long-term value: 0.02* 0.1* mg/m ³ as Mn; *respirable **inhalable fraction

CAS: 7439-98-7 Molybdenum	
PEL	Long-term value: 15* mg/m ³ *Total dust
TLV	Long-term value: 10* 3** mg/m ³ as Mo; *inhalable fraction ** respirable fraction
Ingredients with biological limit values:	
CAS: 7789-75-5 Calcium fluoride	
BEI	2 mg/L 5 mg/m ³ : urine Time: prior to shift Parameter: Fluoride (background, nonspecific)
	3 mg/L 5 mg/m ³ : urine Time: end of shift Parameter: Fluoride (background, nonspecific)

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

8.2 Exposure Controls

General protective and hygienic measures: Wash hands before breaks and at the end of work.

Breathing equipment: Filter P2.

Protection of hands: Heat protection gloves (non-combustible).

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

Penetration time of glove material: The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

Eye protection: Safety glasses.

Body protection: Protective work clothing.

Wear hand, head, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, and well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical form	Solid
Color	Not determined.
Odor	Odorless
pH-value	Not applicable.
Flashpoint	Not applicable.
Flammability (solid, gaseous)	Not determined.
Decomposition temperature	Not determined.
Auto igniting	Product is not selfigniting.
Danger of explosion	Product does not present an explosion hazard.
Explosion limits: Lower: Upper: Relative density: Vapor density: Evaporation rate; Water:	Not determined. Not determined. Not determined. Not applicable. Not applicable, insoluble.
Partition coefficient: Dynamic: Kinematic: Organic solvents: Other information:	Not determined. Not applicable. Not applicable 0,0% No further relevant information.

9.2 Other information

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 and stored according to specifications.

10.3 Possibility of hazardous reactions

Attacks materials containing glass and silicate.

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

Primary irritant effect:

On the skin: No irritant effect.

On the eye: No irritating effect.

Sensitization: No sensitizing effects known.

11.2 Additional toxicological information

The product is not subject to classification according to internally approved calculation methods for preparations:

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

11.3 Carcinogenic categories

IARC (International Agency for Research on Cancer)		
CAS 13463-67-7	Titanium dioxide	2B
CAS 7789-75-5	Calcium flouride	3

NTP (National Toxicology Program)
None of the ingredients is listed.

OSHA-Ca (Occupational Safety & Health Administration)

None of the ingredients is listed.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity: No further relevant information available.

Persistence and degradability: No further relevant information available.

12.2 Behavior in environmental system

Bioaccumulative potential: No further relevant information available.

Mobility in soil: No further relevant information available.

12.3 Additional ecological information

General notes: Water hazard class 1 (Self-assessment): slightly hazardous for water.

12.4 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.5 Other adverse effects

No further relevant information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Recommendation: Must be specially treated adhering to official regulations.

13.2 Uncleaned packagings

Recommendation: Disposal must be made according to official regulations.

SECTION 14: Transport information

DOT, ADR, ADN, IMDG, IATA	Void
UN proper shipping name DOT, ADR, ADN, IMDG, IATA	Void
DOT, ADR, AND, IMDG, IATA Class	Void
Packing group DOT, ADR, IMDG, IATA	Void
Environmental hazards Marine pollutant	No
Special precautions for user	Not applicable
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable
Transport/Additional information	Not dangerous according to the above specifications
UN "Model Regulation"	Void

SECTION 15: Regulatory information

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

No further relevant information available.

15.2 Sara

Section 355 (extremely hazardous substances)

None of the ingredients are listed

Section 313 (Specific toxic chemical listings)

CAS: 7439-96-5	Manganese
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TSCA (Toxic Substances Control Act)

All ingredients are listed

15.3 Proposition 65

Chemicals known to cause cancer:

CAS: 13463-67-7	Titanium oxide
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Chemicals known to cause reproductive toxicity for females

None of the ingredients is listed.

Chemicals known to cause reproductive toxicity for males

None of the ingredients is listed.

Chemicals known to cause developmental toxicity

None of the ingredients is listed.

15.4 Cancerogenity categories

EPA (Environmental Protection Agency)

CAS: 7439-96-5	Manganese	D
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TLV (Threshold Limit Value established by ACGIH)

CAS: 13463-67-7	Titanium oxide	A4
CAS: 7789-75-5	Calcium flouride	A4
CAS: 7439-98-7	Molybdenum	A3

NIOSH-Ca (National Institute for Occupational Safety and Health)

CAS: 13463-67-7	Titanium oxide
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GHS label elements: Void

Hazard pictograms: Void

Signal word: Void

Hazard statements: Void

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

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.

Additional information:

Welding Exposure Scenario WES - ENGL

EWA2011

Recommendations for Exposure Scenarios, Risk Management Measures and to identify Operational Conditions under which metals, alloys and metallic articles may be safely welded

Welding/Brazing produces fumes which can affect human health and the environment. Fumes are a varying mixture of airborne gases and fine particles which, if inhaled or swallowed, constitute a health hazard. The degree of risk will depend on the composition of the fume, concentration of the fume and duration of exposure. The fume composition is dependent upon the material being worked, the process and consumables being used, coatings on the work such as paint, galvanizing or plating, oil or contaminants from cleaning and degreasing activities. A systematic approach to the assessment of exposure is necessary, taking into account the particular circumstances for the operator and ancillary worker that can be exposed.

Considering the emission of fumes when welding, brazing or cutting of metals, it is recommended to (1) arrange risk management measures through applying general information and guidelines provided by this exposure scenario and (2) using the information provided by the Safety Data Sheet, issued in accordance with REACH, by the welding consumable manufacturer.

The employer shall ensure that the risk from welding fumes to the safety and health of workers is eliminated or reduced to a minimum. The following principle shall be applied:

- 1- Select the applicable process/material combinations with the lowest class, whenever possible.
- 2- Set welding process with the lowest emission parameter.
- 3- Apply the relevant collective protective measure in accordance with class number. In general, the use of PPE is taken into account after all other measures is applied.
- 4- Wear the relevant personal protective equipment in accordance with the duty cycle.

In addition, compliance with the National Regulations regarding the exposure to welding fumes of welders and related personnel shall be verified.

In the table "Risk Management Measures for individual process / material combinations" below, reference is made to the following standards for collective and personal protection measures:

ISO 4063	Welding process Reference Numbers according to ISO 4063
EN ISO 15012-1:2004	Health and safety in welding and allied processes - Requirements testing and marking of equipment or air filtration - Part 1: Testing of the separation efficiency for welding fume
EN ISO 15012-2:2008	Health and safety in welding and allied processes - Requirements, testing and marking of equipment for air filtration - Part 2: Determination of the minimum air volume flow rate of captor hoods and nozzles
EN 149:2001	Respiratory protective devices - Filtering half masks to protect against particles - Requirements, testing, marking (FFP1 - FFP2 - FFP3)
EN 1835:2000	Respiratory protective devices. Light duty construction compressed air line breathing apparatus incorporating a helmet or a hood. Requirements, testing, marking (LDH1 - LDH2 - LDH3).
EN 12941:1998	Respiratory protective devices. Powered filtering devices incorporating a helmet or a hood. Requirements, testing, marking (TH1 - TH2 - TH3).
EN 143:2000	Respiratory protective devices — Particle filters — Requirements, testing, marking (P1, P2, P3)
Directive 1998/24/EC	Article 6.2 on the protection of the health and safety of workers from the risks related to chemical agents at work
BGR 190	Benutzung von Atemschutzgeräten (Berufsgenossenschaftliche Regel für Sicherheit und Gesundheit bei der Arbeit)
TRGS 528	Schweisstechnische Arbeiten (Technische Regeln für Gefahrstoffe)

Also in the table "Risk Management Measures for individual process / material combinations", reference is made to footnotes.

The description of these footnotes:

- ¹ Class: approximate ranking to mitigate risk by selecting process/material combinations with the lowest value. Identified collective and individual risk management measures shall be applied
- ² Personal Protective Equipment (PPE) required avoiding exceeding the National Exposure Limit Value (DC: Duty cycle expressed on 8 hours)
- ³ General Ventilation (GV) Low. With additional Local Exhaust Ventilation (LEV) and extracted air to the outside, the GV or LEV capacity may be reduced to 1/5 of the original requirement.
- ⁴ General Ventilation (GV) Medium (double compared to Low)
- ⁵ Filtrating half mask (FFP2)
- ⁶ When an alloyed consumable is used, measures from "Class V" are required
- ⁷ General Ventilation (GV) Low. When no Local Exhaust Ventilation, the ventilation requirement is 5-fold
- ⁸ Filtrating half mask (FFP3), helmet with powered filters (TH2/P2), or helmet with external air supply (LDH2)
- ⁹ Reduced (negative) pressured Area: A separate, ventilated area where reduced (negative) pressure, compared to the surrounded area, is maintained
- ¹⁰ Local Exhaust Ventilation (LEV) High, extraction at source (includes table, hood, arm or torch extraction)
- ¹¹ Helmet with powered filters (TH3/P3), or helmet with external air supply (LDH3)
- ¹² Local Exhaust Ventilation (LEV) Low, extraction at source (includes table, hood, arm or torch extraction)
- ¹³ Local Exhaust Ventilation (LEV) Medium, extraction at source (includes table, hood, arm or torch extraction)
- ¹⁴ Recommended measures to comply with national maximum allowable limits. Extracted fumes, for all materials except unalloyed steel and aluminium, shall be filtered before release in the outside environment.
- ¹⁵ A confined space, despite its name, is not necessarily small. Examples of confined spaces include ship, silos, vats, utility vaults, tanks, etc.
- ¹⁶ Improved helmet, designed to avoid direct flow of welding fumes inside
- ^{n.a.} Not applicable
- ^{n.r.} Not recommended

Risk Management Measures for individual process / base material combinations

Class ¹	Process (according to ISO 4063)	Base Materials	Remarks	Ventilation / Extraction / Filtration ¹⁴	PPE ² DC<15%	PPE ² DC>15%
Non-confined space¹⁵						
I	GTAW 141	All	Except Aluminium	GV low ³	n.r.	n.r.
	SAW 12					
	Autogeneous 3					
	PAW 15					
	ESW/EGW 72/73					
	Resistance 2					
	Stud welding 78					
	Solid state 521					
Gases Brazing 9	All	Except Cd- alloys	GV low ³	n.r.	n.r.	
II	GTAW 141	Aluminium	n.a.	GV medium ⁴	n.a.	FFP2 ⁵
III	MMAW 111	All	Except Be-, V-, Mn-, Ni- alloys and Stainless ⁹	GV low ⁷ LEV low ¹²	Improved helmet ¹⁶	FFP2 ⁵
	FCAW 136/137	All	Except Stainless and Ni- alloys ⁶			
	GMAW 131/135	All	Except Cu-, Be-, V- alloys ⁶			
	Powder Plasma Arc 152	All	Except Be-, V-, Cu-, Mn-, Ni-alloys and Stainless ⁶			
IV	All processes class I	Painted / primed / oiled	No Pb containing primer	GV low ³	FFP2 ⁵	FFP3, TH2/P2, or LDH2 ⁸
	All processes class III	Painted / primed / oiled	No Pb containing primer	GV low ⁷ LEV low ¹²		
V	MMAW 111	Stainless, Ni-, Be-, and V- alloys	n.a.	LEV high ¹⁰	TH3/P3, LDH3 ¹¹	TH3/P3, LDH3 ¹¹
	FCAW 136/137	Stainless, Mn- and Ni- alloys				
	GMAW 131	Cu- alloys				
	Powder Plasma Arc 152	Stainless, Mn-, Ni-, and Cu- alloys				
VI	GMAW 131	Be-, and V- alloys	n.a.	Reduced (negative) pressured area ⁹ LEV low ¹²	TH3/P3, LDH3 ¹¹	TH3/P3, LDH3 ¹¹
	Powder Plasma Arc 152					
VII	Self shielded FCAW 114	Un-, high alloyed steel	Cored wire, not containing Ba	Reduced (negative) pressured area ⁹ LEV medium ¹³	TH3/P3, LDH3 ¹¹	TH3/P3, LDH3 ¹¹
	Self shielded FCAW 114	Un-, high alloyed steel	Cored wire, containing Ba			
	All	Painted / primed	Paint / Primer containing Pb	Reduced (negative) pressured area ⁹ LEV high ¹⁰		
	Arc Gouging and Cutting 8	All	n.a.			
	Thermal Spray	All	n.a.			
	Gases Brazing 9	Cd- alloys	n.a.			
Closed system or Confined space¹⁵						
I	Laser Welding 52	All	Closed system	GV medium ⁴	n.a.	n.a.
	Laser Cutting 84					
	Electron Beam 51					
VIII	All	All	Confined space	LEV high ¹⁰ External air supply	LDH3 ¹¹	LDH3 ¹¹

Abbreviations and acronyms:

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

DOT: US Department of Transportation

IATA: International Air Transport Association