



# Bavaria Schweisstechnik GmbH

## EC MATERIAL SAFETY DATA SHEET (MSDS) „SAW-Wires“

acc. to Regulation (EC) No. 1907 / 2006

with additions of regulations acc. to U.S. Department of Labour OSHA's Hazard Communication Standard

<b>Low-Alloy Nickel Wires acc. to ISO 14171 / 26304: Ni &lt; 4 wt.-%</b>	Version: 2	Revised on: 20.01.2016	Page 1 of 6
		Printed on: 3/15/2018	

### 1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF COMPANY

- 1.1 Substance / Mixture**  
Trade name: Bavaria Nickel-alloyed Wire Electrodes (Ni < 4 %)  
**BA-S2Ni1, BA-S2Ni2, BA-S2Ni3, BA-S3NiMo1/4, BA-S3NiMo1,  
BA-S3NiCrMo2.5**
- Classification:**  
ISO 14171 S2Ni1, S2Ni2, S2Ni2, S2Ni3, S3Ni1Mo0.2, S3Ni1Mo  
ISO 26304 S3Ni2,5CrMo  
AWS A5.23 ENi1, ENi2, ENi3, EF3, EM4-mod.
- 1.2 Use of the substance / mixture**  
Solid Wire Electrodes for Submerged Arc Welding of non alloy and low alloy fine grain steels
- 1.3 Company identification**  
**Manufacturer / Supplier:** Bavaria Schweisstechnik GmbH  
**Street / P.O. box:** Wiesenweg 23  
**Country ID / Postal code / City:** D 85716 Unterschleissheim  
**Technical contact / Information:** Mr. Hubert Lettner  
**Phone no.:** +49(0)89/3171035  
**Fax no.:** +49(0)89/3171796  
**E-Mail:** [bavaria@subarcflux.com](mailto:bavaria@subarcflux.com)
- 1.4 Emergency Information:** Products non-hazardous, no specific effects or hazards known  
Mr. Hubert Lettner  
**E-Mail:** [bavaria@subarcflux.com](mailto:bavaria@subarcflux.com)  
**Phone no.:** +49(0)89/3171035 (office hours: Mo-Fr 9.00 a.m-4.00 p.m.)

### 2. HAZARDS IDENTIFICATION

**Classification:**

There is no requirement to label the products as hazardous according to the "Directive on Dangerous Preparations" (EC) 1999 / 45 / EG.

According to Appendix I of RL 67/548/EWG Nickel is listed as Carc. Cat. 3 and as sensitizing. Because of this any mixture containing 1 % or more Nickel is classified as for pure Nickel acc. to RL 1999 / 45 / EG. Nevertheless, these products as shipped do not pose any hazards to human health by inhalation, ingestion or skin contact and therefore do not have to be labeled as such. Section 15 covers all necessary information regarding Nickel.

**Additional hazards information:**

In addition to Nickel these low alloy wire electrodes also contain alloying elements such as Chromium, Copper, Manganese, Molybdenum, Silicon, Titanium and Vanadium which are either not classified as hazardous acc. to RL 1999/45/EG or are below the threshold limits or no limits set.

The International Agency for Research on Cancer indicates Nickel refining and certain Nickel compounds as cancer-causing but could not confirm with certainty which forms of Nickel may be carcinogenic. The National Toxicology Program lists Nickel powder, Nickel subsulfide, Nickel carbonate, Nickel carbonyl and Nickel oxide as substances „that may reasonably be anticipated to be carcinogens“. Therefore the OSHA Hazard Communication Standard requires that the MSDS's of products containing these substances must warn of a cancer hazard. This warning is mandated by OSHA even though studies have not demonstrated cancer risks associated with the use of Nickel.

The International Agency for Research on Cancer and The National Toxicology Program indicate there is sufficient evidence for carcinogenicity of Chromium compounds both in humans and experimental animals although 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.

Inhaling of gases or fumes is to be avoided.

The fumes and gases produced during submerged arc welding are covered by Section 8. 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 (mainly Iron oxides) occur. These have to be thoroughly ventilated in the welding area and require local exhaust at the arc according to the corresponding safety standards.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

This section covers the materials from which the different wire electrodes are manufactured. CAS numbers shown are representative for the ingredients listed for SAW – electrodes. All ingredients listed may not be present in all types of the wire electrodes or diameters.



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The solid wires are molten in an electric arc furnace / AOD converter combination and continuously cast. This ensures a uniform chemistry throughout the melt. During rolling and drawing close control of diameter is observed as well as close control of the copper-coating.

The wire electrodes are classified according to ISO 14171 and ISO 26304. The chemical composition is in accordance with ISO 14171, ISO 26304 and AWS A5.23 with the following limits for the main ingredients:

Ingredients	EC-Number EINECS	CAS-No.	Weight-%	Hazard Symbol(s)	R-phrases
Carbon	231-153-3	7440-44-0	< 0.15		
Silicon	231-130-8	7440-21-3	< 0.30		
Manganese	231-105-1	7439-96-5	< 1.90		
Iron	231-096-4	7439-89-6	> 94.0		
Molybdenum	231-107-2	7439-98-7	< 0.70		
Nickel	231-111-4	7440-02-0	< 3.80	Xn / Carc. Cat.3	R40, R43, R48/23, R52/53
Chromium	231-157-5	7440-47-3	< 0.90		
Residuals: Cu < 0.30 %, other Elements < 0.1 %					

Full text of the relevant R-phrases and hazard symbols: see section 16.

### Chemical Characterization:

**Compact Low Alloy Steel wire electrodes which are non-hazardous until welded.**

## 4. FIRST AID MEASURES

### General information:

Employ first-aid techniques recommended by the National Ambulance Authorities. In case of skin injuries, electric shock, irritation of eyes and burns call for medical aid and if possible show this MSDS.

### In case of inhalation:

Fresh air supply. If welding fumes are inhaled provide fresh air, if breathing has stopped apply artificial respiration and call a doctor.

### In case of skin contact:

Wash properly with water and soap, if irritation starts seek medical advice.

### In case of eye contact:

Flush eyes with running water for several minutes, if irritation persists see a doctor. If "flashed eyes" (ophthalmia electrica) from the arc develop seek medical advice. In case of injury by spatters an eye specialist has to be consulted immediately.

In case of ingestion: N/A

## 5. FIRE FIGHTING MEASURES

### Suitable extinguishing media:

extinguishing media appropriate for the working area

### Special danger criteria:

products non-flammable

### Protective measures:

no special protective measures required

### Additional information:

Hot work-pieces or hot slag-particles as well as sparks may cause ignition of combustibles and inflammable materials such as packaging; therefore, keep inflammable materials away from the welding area.

Welding equipment may be live; see precautions for electrical power sources.

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions:

Observe special precautions as described in Section 8, only collect wire remnants and flux slags after fully cooled.

### Environmental precautions:

no special measures required

### Methods for cleaning up:

collect wire remnants mechanically

## 7. HANDLING AND STORAGE

### Handling

#### Advice for safe handling:

Spoiled wire is normally delivered on wooden pallets and shrink-wrapped in plastic foil or kept in dry cardboard packaging and must not be exposed to direct wetness, like snow or rain; transportation must be done in a suitable manner.

All data and information are based on our present knowledge and are no assurance of the property and of the quality characteristic. Legal regulations have to be observed on own responsibility. Changes are possible without previous information.



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Avoid exposure to welding fumes and gases, radiation, spatter, electrical shock, heated materials and dust, use well ventilated rooms; national safety rules are strictly to be adhered to. Handle with care to avoid cuts. Spooled wire can be springy.

### Precautions against fire and explosion:

No specific precautions required.

### Storage

### Technical measures and storage conditions:

Avoid humidity and temperature shocks, store in dry storage rooms in a secure manner to prevent slipping, falling or tipping-over.

### Specific use:

Submerged-arc welding wire electrodes for SAW applications such as pressure vessel and boiler construction, pipe welding, ship building and steel construction.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ingredients	Weight-%	CAS-No.	Occupational exposure limit values mg/m <sup>3</sup> *)	Remarks **)	OSHA PEL ***) mg/m <sup>3</sup>	ACGIH TLV ****) mg/m <sup>3</sup>
Silicon	< 0.30 %	7440-21-3	10 E / 3 A	General threshold limit value for dust -respirable fraction	5R	10
Manganese	< 1.90 %	7439-96-5	0.5 E		1	0.2
Iron	< 94.0 %	7439-89-6	10 E / 3 A	General threshold limit value for dust -respirable fraction	5R	3R
Molybdenum	< 0.70 %	7439-98-7	10 E / 3 A	General threshold limit value for dust -respirable fraction	5R	3R
Nickel	< 3.80 %	7440-02-0	10 E / 3 A	General threshold limit value for dust -respirable fraction	1	1
Chromium	< 0.90 %	7440-47-3	2 E		1	0.5
Copper	< 0.30 %	7440-50-8	10 E / 3 A	General threshold limit value for dust -respirable fraction	1	1

Other elements such as Al, V, Ti, Nb may also be present; because of the low concentrations no limits are indicated.

\*) TRGS 900: E = inhalable fraction; A = alveolar fraction

\*\*) No substance-specific occupational exposure limit established, the general threshold limit value is to be considered as the upper limit

\*\*\*) OSHA PEL: Permissible Exposure Limit R = respirable fraction

\*\*\*\*) ACGIH TLV: Threshold Limit Value R = respirable fraction

As shipped wire electrodes described in this data sheet are non-reactive, non-inflammable, non-explosive and essentially non-hazardous until welded. However, during welding the relevant safety regulations have to be observed.

The fume and gas decomposition products generated during welding are different in percent and form from the ingredients listed and cannot be classified simply. The composition and quantity of the decomposition products are dependent upon the metal being welded, the welding procedure and the wire electrodes used. Most fume ingredients are present as complex oxides and compounds and not as pure metals.

### Exposure limit values:

The ingredients indicated cover the materials from which these products are manufactured. No occupational control is necessary for the products until welded as these ingredients are alloying additions within the solid metal wire electrodes.

The occupational exposure limit acc. to TRGS 900 for the general threshold limit value for dust of 10 mg/m<sup>3</sup> -respirable- and 3 mg/m<sup>3</sup> -alveolar- fraction is not reached during proper handling of the products.

During SA-welding the welding fumes from the use of these products may contain Fluorides and complex oxides and compounds of Aluminium, Chromium, Iron, Magnesium, Manganese, Molybdenum, Nickel, Silicon and Titanium whose exposure limits are lower than the 5 mg/m<sup>3</sup> TLV for general welding fume as established by OSHA PEL and ACGIH TLV.

Any Chromium and Nickel compounds that are produced during grinding and welding are considered carcinogens according to OSHA (29 CFR 1910.1200).

### Occupational exposure controls:

Use enough ventilation and local fume extraction to keep fume and gas concentrations below threshold limit values.

### Respiratory protection:

Inhalation of welding fumes or gases is to be avoided: if in spite of local extraction the recommended exposure limits are exceeded wear approved protection masks. In case of excessive dust formation use a dust respirator.

### Hand protection:

wear suitable heat-resistant welding gloves

### Eye protection:

wear protective goggles

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### Body protection:

Wear safety shoes, use industrial heat-resisting safety clothes and train the welder not to touch live electrical parts. After work and before a break wash hands (and face) thoroughly with soap. Do not eat, drink or smoke during work.

### Environmental exposure controls:

The local and national waste and waste water disposal rules are to be observed. (see sections 13 and 15)

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### General information

<b>Appearance:</b>	solid wire
<b>Colour:</b>	metallic or copper red
<b>Smell:</b>	not specific, odourless

### Important health, safety and environmental information

<b>pH value</b>	N/A
<b>Boiling point</b>	N/A
<b>Flashpoint</b>	non-inflammable (apart from packaging)
<b>Ignition</b>	N/A
<b>Explosion hazard</b>	N/A
<b>Fire-supporting properties</b>	N/A
<b>Steam pressure</b>	N/A
<b>Relative density</b>	approx. 8 g/cm <sup>3</sup>
<b>Solubility</b>	insoluble in water
<b>Dispersion coefficient</b>	n-Octanol / Water, N/A
<b>Viscosity</b>	N/A
<b>Steam density</b>	N/A
<b>Evaporation speed</b>	N/A

### Other details

<b>Melting point</b>	approx. 1600 °C
<b>Selfignition temperature</b>	N/A

## 10. STABILITY AND REACTIVITY

<b>Stability:</b>	the products are stable; no dangerous reactions known
<b>Conditions to avoid:</b>	N/A; no dangerous reactions known
<b>Materials to avoid:</b>	N/A; no dangerous reactions known
<b>Hazardous decomposition products:</b>	none if properly stored and handled

## 11. TOXICOLOGICAL INFORMATION

### Toxicity

Constituent	Test	Result	Route	Species
Nickel	LD50	>9000 mg/kg	Oral	Rat

According to Appendix I of RL 1272/2008EG Nickel causes sensitization by skin contact if a release of 0.5 Microgram Ni/cm<sup>2</sup>/week is exceeded. This classification is based on studies of Nickel refineries

If the products are properly handled and the occupational exposure limit values observed there is no risk to be expected according to our present state of knowledge.

### Short-term health effects

#### Inhalation:

In case of improper use higher concentrations of dust, fumes and gases may result in discomfort such as dizziness, nausea, dryness or irritation of nose and throat.

**Ingestion:** inadequate data available

**Skin and eye contact:** inadequate data available

### Potential chronic health effects

#### Carcinogenicity:

Inadequate data available; during welding of Nickel-, Chromium-, or Cobalt-alloyed base materials or wire electrodes the fumes and vapour/gases that are produced are considered as carcinogenic and require proper local fume exhaust.

**Mutagenicity:** no specific effects or hazards known

**Reproduction toxicity:** no specific effects or hazards known



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### Symptoms of repeated overexposure:

Long-term inhalation or repeated overexposure to welding fume containing Manganese compounds can affect the central nervous system; welding fume containing iron and iron oxides can lead to Siderosis (deposits of Iron in the lungs) that may affect pulmonary function.

Silica present in welding fumes is in the amorphous state, i.e. in non-crystalline, non-fibratic form and is therefore not considered to be dangerous.

Chromium and Nickel compounds in the welding fume are considered carcinogens.

According to the EC general classification regulations for preparations or mixtures the products require no European labelling.

### Experiences made in practice:

According to our present state of knowledge no damaging effect expected when treated in accordance with standard industrial practices and local regulations where applicable.

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity:

Because the wire electrodes are solid and compact and due to lack of solubility in water biodegradation is not likely. However, Nickel is considered to be harmful to aquatic organisms, therefore conditions that lead to accumulation in soil or groundwater are to be avoided.

### Mobility:

no specific effects or hazards known

### Persistence und degradability:

anorganic products; no biological degradation known.

The products are stable and not soluble in water and cannot be eliminated from water by biological purification processes.

### Bioaccumulative potential:

no specific effects or hazards known

### Other adverse effects:

no specific effects or hazards known

## 13. DISPOSAL CONSIDERATIONS

### Packaging:

Packaging must be completely emptied. Paper and cardboard packaging and PE-foil and PE-thermo-shrinking foil are to be recycled according to local regulations.

### Wire remnants and basket spools:

Wire baskets, metal drums, spiders and wire remnants are to be disposed of as metal scrap according to local regulations.

## 14. TRANSPORT INFORMATION

Non-hazardous products according to national and international transport regulations.

### Land transport:

ADR/RID

not restricted

GGVS/GGVE

products not hazardous regarding transport regulations

### Sea transport:

IMDG/GGV SEA-CLASS

products non-hazardous

Marine Pollutant

products non-hazardous

### Air transport:

ICAO-TI/IATA-CLASS

products non-hazardous

## 15. REGULATORY INFORMATION

### Labelling according to EC-Regulation:

According to EC-Regulation the products are not subject to classification and labelling.

The hazard identification and R-phrases, as described in Section 2 –classification-, are in accordance to 67/548/EWG for Nickel which is included in the wire electrodes as an alloying addition.

Xn

Harmful if swallowed

R-phrases:

R40, R43, R48/23, R52/53

### National regulations:

According to the latest regulations in the GefStoffV "German Ordinance on Hazardous Substances" the products do not have to be labelled and are not classified as hazardous for water.

## 16. OTHER INFORMATION

### Further information:

All constituents are listed in the European chemical Substances Information System and the products can be put into circulation.

### Further information by:

TÜV SÜD Industrie Service: **E-Mail** (proficient person): REACH@tuev-sued.de

