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

1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF COMPANY

1.1 Substance / Mixture

Trade name:	Bavaria Wire Electrodes **(Ni < 0,15 %)**	**BA-S1, BA-S2, BA-S2Si, BA-S3, BA-S3Si, BA-S4 BA-S2Mo, BA-S3Mo, BA-S4Mo**
Classification:	ISO 14171	S1, S2, S2Si, S3, S3Si, S4, S2Mo, S3Mo, S4Mo
	AWS A5.17	EL12, EM12, EM12K, EH10, EH12K, EH14
	AWS A5.23	EA2, EA4, EA3

1.2 Use of the substance / mixture

Solid Wire Electrodes for Submerged Arc Welding C-Mn and low-alloy 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

1.4 **Emergency** Product non-hazardous, no specific effects or hazards known

Information:	Mr. Hubert Lettner
E-Mail:	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:

The products are classified as non-hazardous according to the “Directive on Dangerous Preparations” (EC) 1999 / 45 / EG.

Additional hazards information:

Inhaling of gases or fumes is to be avoided.

The fumes and gases produced during submerged arc welding are covered by Section 8. The fume and gas decomposition products generated during welding are different in percent and form from the ingredients listed in Section 3. 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.

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 the chemical composition is in accordance with ISO 14171, AWS A5.17 and 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	< 0.40		
Manganese	231-105-1	7439-96-5	< 2.25		
Iron	231-096-4	7439-89-6	> 95.0		
Molybdenum	231-107-2	7439-98-7	< 0.65		
Residuals weight-%: Ni < 0.15 %, Cr < 0.15 %, Cu < 0.30 %, other Elements < 0.1 %					

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

Chemical Characterization:
Carbon and Low Alloy Steel wire electrodes which are non-hazardous until welded.

Additional Information:
These carbon and low alloy steel qualities contain alloying elements which are either classified as non-hazardous or below the threshold limit or without effective limits acc to RL 1999/45/EG; only if Nickel is added to the mixture by 1 % or more is the mixture classified as Carc. Cat. 3 as for pure Nickel.

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:
Spooled 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.
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/m³ *)	Remarks **)	OSHA PEL ***) mg/m³	ACGIH TLV ****) mg/m³
Silicon	< 0.40 %	7440-21-3	10 E / 3 A	General threshold limit value for dust -respirable fraction	5R	10
Manganese	< 2.25 %	7439-96-5	0.5 E		1	0.2
Iron	< 95.0 %	7439-89-6	10 E / 3 A	General threshold limit value for dust -respirable fraction	5R	3R
Molybdenum	< 0.65 %	7439-98-7	10 E / 3 A	General threshold limit value for dust -respirable fraction	5R	3R
Nickel	< 0.15 %	7440-02-0	10 E / 3 A	General threshold limit value for dust -respirable fraction	1	1
Chromium	< 0.15 %	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.
Welding fumes and gases cannot be classified simply. The composition and quantity of both 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/m³ -respirable- and 3 mg/m³ -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/m³ TLV for general welding fume.
Any Chromium and Nickel compounds that may be 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

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

Appearance:	solid wire
Colour:	metallic or copper red
Smell:	not specific, odourless

Important health, safety and environmental information

pH value	N/A
Boiling point	N/A
Flashpoint	non-inflammable (apart from packaging)
Ignition	N/A
Explosion hazard	N/A
Fire-supporting properties	N/A
Steam pressure	N/A
Relative density	approx. 8 g/cm³
Solubility	insoluble in water
Dispersion coefficient	n-Octanol / Water, N/A
Viscosity	N/A
Steam density	N/A
Evaporation speed	N/A

Other details

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

10. STABILITY AND REACTIVITY

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

11. TOXICOLOGICAL INFORMATION

Toxicity

According to our present state of knowledge there is no risk during proper handling of the products.

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: no specific effects or hazards known

Skin and eye contact: no specific effects or hazards known

Potential chronic health effects

Carcinogenicity:

No specific effects or hazards known; 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

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: no specific effects or hazards known
There is no known hazard caused to water as the wire electrodes are solid and hardly soluble in water.
Mobility: no specific effects or hazards known
Persistence und degradability: anorganic products; no biological degradation known.
Welding electrodes could degrade into components originating from the products, therefore conditions that lead to accumulation in soil or groundwater are to be avoided.
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.
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

European hazard symbols and indication of danger for constituents

Relevant risk phrases (R-phrases):	**During welding**
R20	Harmful by inhalation
R36/37/38	Irritating to eyes, respiratory system and skin

Relevant safety advices (S-phrases):

S20	When using do not eat or drink
S22	Do not breathe dust
S23	Do not breathe welding fume
S25	Avoid contact with eyes
S36/37	Wear suitable protective clothing and gloves

Revision Information revised acc. to Regulation (EC) No. 1907 / 2006

Data sources

The following regulations and safety standards have been taken into account for this Material Safety Data Sheet (MSDS)

L 136 Official Journal of the European Union (corrigendum to Regulation (EC) No. 1907 / 2006):
ANNEX II - GUIDE TO THE COMPILATION OF SAFETY DATA SHEETS
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
Notification Document 220-09/2007: “Notification on Hazardous Substances for MSDS”
GefStoffV: “German Ordinance on Hazardous Substances”
TRGS 900: “German Occupational Exposure Limit Values”
UVV VBG 15: “Welding, Cutting and similar Procedures”
DVS 1203: “Aspects of labour protection for the installation of welding shops”
American Conference of Government Industrial Hygienists (ACGIH): Threshold Limit Value (TLV)
OSHA-Hazard Communication Standard 29CFR 1910.1200: Permissible Exposure Limits For Air Contaminants (PEL)
American Chemical Society-CAS-Number: Chemical Abstracts Service
ANSI Z 49.1: Safety in Welding and Cutting
WMA Publication 236 and 239: Hazards from Welding Fume (UK)

Warning

Safety in welding is published in different papers which have become mandatory for many countries. A brief excerpt from the U.S.-Paper Z 49.1 should be carefully observed:

Caution !

ELECTRIC SHOCK can be dangerous
FUMES and GASES can be hazardous
ARC RAYS can injure eyes and burn skin

Do not touch live electrical parts. Keep your head out of fumes. Wear dry insulation gloves and clothing. Wear correct eye, ear and body protection when necessary. Use ventilation or exhaust at the welding area to keep fumes and gases from your breathing zone, especially when welding CrNi-alloyed wires. Read and follow the manufacturer’s instructions, employer’s safety practices and the relevant material safety data sheet (MSDS).

The above information describes exclusively the safety requirements of the products and is based on our present-day knowledge and experience. It does not represent a guarantee for the properties of the products described in terms of the legal warranty regulations.