SAFETY DATA SHEET

This Safety Data Sheet complies with European Commission Directive 91/155/EEC, ISO 11014-1 and ANSI Z400.1

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: OK Tigrod 316L
Application: Arc Welding
Classification(s): EN 12072: W 19 12 3 L, SFA/AWS A5.9: ER316L
Supplier: ESAB AB, Box 8004, 402 77 Göteborg, Sweden
Telephone no.: +46 31 509000
Web site: www.esab.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a solid metal rod.

Wire Composition	Weight %	CAS#	EINECS#	Hazard classification[1]	IARC [2]	NTP [3]	OSHA List[4]
Chromium	15-20	7440-47-3	231-157-5	No	-	-	-
Copper	<1	7440-50-8	231-159-6	No	-	-	-
Iron	>60	7439-89-6	231-096-4	No	-	-	-
Manganese	2-5	7439-96-5	231-105-1	No	-	-	-
Molybdenum	2-5	7439-98-7	231-107-2	No	-	-	-
Nickel	10-15	7440-02-0	231-111-4	Xn; R40-43	Possibly carcinogenic to humans (2B)	Reasonably anticipated to be a human carcinogen	-
Silicon	<1	7440-21-3	231-130-8	No	-	-	-

[1] Hazard Classification according to European Council Directive 67/548/EEC, for R-phrases see heading 16.

[2] Evaluation according to the International Agency for Research on Cancer.

[3] Classification according to the 11th Report on Carcinogens, published by the US National Toxicology Program

[4] Carcinogen listing according to OSHA, Occupational Safety & Health Administration (USA)

3. HAZARDS IDENTIFICATION

Emergency overview: Metal wire or rods in varying colours. This product is normally not considered hazardous as shipped. Gloves should be worn when handling to prevent cuts and abrasions.

This product contains nickel, which is classified as a skin sensitizer and a suspect carcinogen. In the form that nickel is present in this product it does not contribute to a hazard classification of the product. Skin contact is normally no hazard but should be avoided to prevent possible allergic reactions.

Persons with a pacemaker should not go near welding or cutting operations until they have consulted their doctor and obtained information from the manufacturer of the device.

When this product is used in a welding process, the most important hazards are heat, radiation, electric shock and welding fumes.

Heat: Spatter and melting metal can cause burn injuries and start fires.

Radiation: Arc rays can severely damage eyes or skin.

Electricity: Electric shock can kill.

Fumes: Very small amounts of welding fumes are normally produced by TIG welding. Overexposure to welding fumes may result in symptoms like dizziness, nausea, dryness or irritation of the nose, throat or eyes. Chronic overexposure to welding fumes may affect pulmonary function. Prolonged inhalation of nickel and chromium compounds above safe exposure limits can cause cancer. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain.

4. FIRST AID MEASURES

Inhalation: If breathing has stopped, perform artificial respiration and obtain medical assistance immediately! If breathing is difficult, provide fresh air and call physician.

Eye contact: For radiation burns due to arc flash, see physician. To remove dusts or fumes flush with water for at least fifteen minutes. If irritation persists, obtain medical assistance.

Skin contact: For skin burns from arc radiation, promptly flush with cold water. Get medical attention for irritation or burns that persists. To remove dust or particles wash with mild soap and water.

Electric shock: Disconnect and turn off the power. Use a nonconductive material to pull victim away from contact with live parts or wires. If not breathing, begin artificial respiration, preferably mouth-to-mouth. If no detectable pulse, begin Cardio Pulmonary Resuscitation (CPR). Immediately call a physician.

General: Move to fresh air and call for medical aid.

5. FIRE FIGHTING MEASURES

No specific recommendations for welding consumables. Welding arcs and sparks can ignite combustible and flammable materials. Use the extinguishing media recommended for the burning materials and fire situation. Wear self-contained breathing apparatus as fumes or vapors may be harmful.

6. ACCIDENTAL RELEASE MEASURES

Solid objects may be picked up and placed into a container. Liquids or pastes should be scooped up and placed into a container. Wear proper protective equipment while handling these materials. Do not discard as refuse.

Personal precautions: refer to section 8

Environmental precautions: refer to section 13

7. HANDLING AND STORAGE

Handling:

Avoid exposure to welding fumes, radiation, spatter, electric shock, heated materials and dust. Do not ingest. Handle with care to avoid stings and cuts. Wear gloves when handling welding consumables. Some individuals can develop an allergic reaction to certain materials. Retain all warning and identity labels.

Storage:

Keep separate from chemical substances like acids and strong bases, which could cause chemical reactions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering measures:

Ensure sufficient ventilation, local exhaust, or both, to keep welding fumes and gases from breathing zone and general area. Keep working place and protective clothing clean and dry. Train welders to avoid contact with live electrical parts and insulate conductive parts. Check condition of protective clothing and equipment on a regular basis.

Personal protective equipment:

Use respirator or air supplied respirator when welding or brazing in a confined space, or where local exhaust or ventilation is not sufficient. Use special care when welding painted or coated steels since hazardous substances from the coating may be emitted. Wear hand, head, eyes, ear and body protection like welders gloves, helmet or face shield with filter lens, safety boots, apron, arm and shoulder protection. Keep protective clothing clean and dry.

Use industrial hygiene monitoring equipment to ensure that exposure does not exceed applicable national exposure limits. The following limits can be used as guidance for dust. For information about welding fume analysis refer to section 10.

Substance	CAS#	ACGIH TLV [(1)] mg/m^3	OSHA PEL [(2)] mg/m^3
Chromium	7440-47-3	0.5	1
Copper	7440-50-8	1	1
Iron	7439-89-6	5	-
Manganese	7439-96-5	0.2	5
Molybdenum	7439-98-7	10	-
Nickel	7440-02-0	1.5	1
Silicon	7440-21-3	-	15

(1) Threshold Limit Values according to American Conference of Governmental Hygienists, 2006

(2) Permissible Exposure Limits according to the Occupational Safety & Health Administration (USA)

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Solid, non-volatile with varying color

Melting point: >1000°C / >1800ºF

10. STABILITY AND REACTIVITY

General: This product is only intended for normal welding purposes.

Stability: This product is stable under normal conditions.

Reactivity: Contact with chemical substances like acids or strong bases could cause generation of gas.

When this product is used in a welding process, hazardous decomposition products would include those from the volatilization, reaction or oxidation of the materials listed in section 2 and those from the base metal and coating.

The amount of fumes generated from this type of product is normally very small, but varies with welding parameters. Reasonably expected fume constituents of this product would include oxides of metals such as iron, manganese, chromium, nickel, copper, and silicon.

Refer to applicable national exposure limits for fume compounds. A significant amount of the chromium in the fumes can be hexavalent chromium, which has a very low exposure limit in some countries.

Reasonably expected gaseous products would include carbon oxides, nitrogen oxides and ozone. Air contaminants around the welding area, can be effected by the welding process and influence the composition and quantity of fumes and gases produced.

11. TOXICOLOGICAL INFORMATION

Inhalation of welding fumes and gases can be dangerous to your health. Classification of welding fumes is difficult because of varying base materials, coatings, air contamination and processes. The International Agency for Research on Cancer has classified welding fumes as possibly carcinogenic to humans (Group 2B).

Acute toxicity: Overexposure to welding fumes may result in symptoms like metal fume fever, dizziness, nausea, dryness or irritation of the nose, throat or eyes.

Chronic toxicity: Overexposure to welding fumes may affect pulmonary function. Prolonged inhalation of nickel and chromium compounds above safe exposure limits can cause cancer. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain.

12. ECOLOGICAL INFORMATION

Welding consumables and materials could degrade/weather into components originating from the consumables or from the materials used in the welding process. Avoid exposure to conditions that could lead to accumulation in soils or groundwater.

13. DISPOSAL CONSIDERATIONS

Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal and local regulations. Use recycling procedures if available.

USA RCRA: Unused products or product residue containing chromium is considered hazardous waste if discarded, RCRA ID Characteristic Toxic Hazardous Waste D007.

Residues from welding consumables and processes could degrade and accumulate in soils and groundwater.

14. TRANSPORT INFORMATION

No international regulations or restrictions are applicable.

15. REGULATORY INFORMATION

Read and understand the manufacturer's instructions, your employer's safety practices and the health and safety instructions on the label. Observe any federal and local regulations. Take precautions when welding and protect yourself and others.

WARNING: Welding fumes and gases are hazardous to your health and may damage lungs and other organs.

ELECTRIC SHOCK can kill.

ARC RAYS and SPARKS can injure eyes and burn skin.

Wear correct hand, head, eye and body protection.

FIRST AID - If exposed to excess welding fumes, move to fresh air, wash eyes or skin with water to remove dust. In case of arc rays, or electric shock, employ normal first aid techniques and call a physician immediately.

Canada: WHMIS classification: Class D; Division 2, Subdivision A

Canadian Environmental Protection Act (CEPA): All constituents of this product are on the Domestic Substance List (DSL).

USA: Under the OSHA Hazard Communication Standard, this product is considered hazardous.

This product contains or produces a chemical known to the state of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code § 25249.5 et seq.)

United States EPA Toxic Substance Control Act: All constituents of this product are on the TSCA inventory list or are excluded from listing.

CERCLA/SARA Title III

Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs):

Ingredient name	RQ (lb)	TPQ (lb)
Product is a solid solution in the form of a solid article.	-	-

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center and to your Local Emergency Planning Committee.

Section 311 Hazard Class

As shipped: Immediate In use: Immediate delayed

EPCRA/SARA Title III 313 Toxic Chemicals

The following metallic components are listed as SARA 313 “Toxic Chemicals” and potential subject to annual SARA 313 reporting. See Section 2 for weight percent.

Ingredient name	Disclosure threshold
Chromium	1.0% de minimis concentration
Manganese	1.0% de minimis concentration
Copper	1.0% de minimis concentration
Nickel	0.1% de minimis concentration

16. OTHER INFORMATION

Refer to ESAB "Welding and Cutting - Risks and Measures", F52-529 “Precautions and Safe Practices for Electric Welding and Cutting” and F2035 “Precautions and Safe Practices for Gas Welding, Cutting and Heating” available from ESAB, and to:

USA: Contact ESAB at www.esabna.com or 1-800-ESAB-123 if you have questions about this SDS.

American National Standard Z49.1 "Safety in Welding and Cutting", ANSI/AWS F1.5 “ Methods for Sampling and Analyzing Gases from Welding and Allied Processes”, ANSI/AWS F1.1 “Method for Sampling Airborne Particles Generated by Welding and Allied Processes”, AWSF3.2M/F3.2 “Ventilation Guide for Weld Fume”, American Welding Society, 550 North Le Jeune Road, Miami, Florida, 33135. Safety and Health Fact Sheets available from AWS at www.aws.org

OSHA Publication 2206 (29 C.F.R. 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954

American Conference of Governmental Hygienists (ACGIH), Threshold Limit Values and Biological Exposure Indices, 6500 Glenway Ave., Cincinatti, Ohio 45211, USA.

NFPA 51B “Standard for Fire Prevention During Welding, Cutting and Other Hot Work” published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169

UK: WMA Publication 236 and 237, "Hazards from Welding fume", "The arc welder at work, some general aspects of health and safety".

Germany: Unfallverhütungsvorschrift BGV D1, "Schweißen, Schneiden und verwandte Verfahren".

Canada: CSA Standard CAN/CSA-W117.2-01 "Safety in Welding, Cutting and Allied Processes"

This product has been classified according to the hazard criteria of the CPR and the SDS contains all the information required by the CPR.

This Safety Data Sheet has been revised due to modifications to several paragraphs and/or new format. This SDS supersedes W182/03 and 7990.

R-phrases: R40 - Limited evidence of a carcinogenic effect.
R43 - May cause sensitization by skin contact.

ESAB request the users of this product to study this Safety Data Sheet (S.D.S.) and become aware of product hazards and safety information. To promote safe use of this product a user should:

- notify its employees, agents and contractors of the information on this S.D.S and any product hazards/safety information.
- furnish this same information to each of its customers for the product.
- request such customers to notify employees and customers for the same product hazards and safety information.

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