SAFETY DATA SHEET

This Safety Data Sheet complies with Regulation (EC) No 1907/2006, 1272/2008, ISO 11014-1 and ANSI Z400.1

OK Tigrod 308L (North America)

Replaces SDS: 2015-04-06

Issued: 2017-06-01

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

1.1. Product identifier

Trade name	OK Tigrod 308L (North America)

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use	Arc Welding

1.3. Details of the supplier of the safety data sheet

Supplier	ESAB Welding & Cutting Products
Street address	801 Wilson Ave. Hanover, PA 17331
Telephone	1-717-637-8911
Fax	1-717-630-3458
Email	us.technical.fillermetals@esab.com
Web site	www.esabna.com

1.4. Emergency telephone number

Emergency phone number	1-800-424-9300 (Chemtrec)
Available outside office hours	Yes

Other

Classification: AWS A5.9; ER308L

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Description	This product is not classified as hazardous according to applicable GHS hazard classification criteria as required and defined in OSHA Hazard Communication Standard (29CFR Part 1910.1200).

2.2. Label elements

More information	This product does not require labeling.

2.3. Other hazards

This product contains nickel, which is classified as toxic by prolonged inhalation, a skin sensitizer and a suspect carcinogen. 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 welding fumes, heat, radiation and electric shock.
Fumes: Overexposure to welding fumes may result in symptoms like metal fume fever, 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, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, disturbances and spastic gait.
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.

Other

Emergency Overview: Metal rods in varying color. This product is normally not considered hazardous when transported. Gloves should be worn when handling to prevent cuts and abrasions.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical name	***CAS No.*** ***EC No.*** ***REACH No.***	***Concentration***	***Classification***	***R-phrase*** ***H-phrase***
Iron	7439-89-6 231-096-4 01-2119462838 - 24	>60%	- -	- -
Chromium	7440-47-3 231-157-5 -	10 - 30%	- -	- -
Nickel metal	7440-02-0 231-111-4 -	7 - 13%	- Carc. 2, Skin Sens. 1, STOT RE 1	- H317, H351, H372
Manganese	7439-96-5 231-105-1 01-2119449803 - 34	1 - 5%	- -	- -
Copper	7440-50-8 231-159-6 01-2119480154 - 42	<0,75%	- -	- -
Molybdenum	7439-98-7 231-107-2 -	<0,75%	- -	- -
Silicon	7440-21-3 231-130-8 -	0,3 - 0,65%	- -	- -

Product based on	This product is a solid metal rod.

SECTION 4: First aid measures

4.1. Description of first aid measures

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). call emergency physician to the scene of the accident. Call a physician immediately.

Inhalation	If breathing has stopped, perform artificial respiration and obtain medical assistance immediately! If breathing is difficult, provide fresh air and call physician.
Skin contact	For skin burns from arc radiation, promptly flush with cold water. Get medical attention for burns or irritations that persist. To remove dust or particles wash with mild soap and water.
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.

4.2. Most important symptoms and effects, both acute and delayed

Not applicable

4.3. Indication of any immediate medical attention and special treatment needed

Not applicable

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	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.

5.2. Special hazards arising from the substance or mixture

Not applicable

5.3. Advice for firefighters

Special protective equipment for fire-fighters	Wear self-contained breathing apparatus as fumes or vapors may be harmful.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Refer to Section 8.

6.2. Environmental precautions

Refer to Section 13.

6.3. Methods and material for containment and cleaning up

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.

6.4. Reference to other sections

Refer to Section 8 and Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Preventive handling precautions	Handle with care to avoid stings and cuts. Wear gloves when handling welding consumables. Avoid exposure to dust. Do not ingest. Some individuals can develop an allergic reaction to certain materials. Retain all warning and identity labels.

7.2. Conditions for safe storage, including any incompatibilities

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

7.3. Specific end use(s)

Arc Welding

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limits	Use industrial hygiene monitoring equipment to ensure that exposure does not exceed applicable national exposure limits. The following limits can be used as guidance. Unless noted, all values are for 8 hour time weighted averages (TWA). For information about welding fume analysis refer to Section 10. ACGIH TLV, mg/m3 Chromium metal 0.5 Chromium (VI), inorganic compounds, insoluble 0.01 (as Cr) Chromium (VI), inorganic compounds, water-soluble 0.05 (as Cr) Copper (fume, as Cu) 0.2 Iron and Iron oxide 5 Respirable fraction Manganese, fume, as Mn 0.02 Respirable fraction 0.1 Inhalable fraction Manganese and inorganic compounds, as Mn 0.02 Respirable fraction 0.1 Inhalable fraction Molybdenum and insoluble compounds, as Mo 3 Respirable fraction 10 Inhalable fraction Molybdenum and soluble compounds, as Mo 0.5 Respirable fraction Nickel, elemental 1.5 Inhalable fraction USA, OSHA PEL, mg/m3

National occupational exposure limits

Ingredient	*CAS no.*	*EC No.*	*Exposure limit mg/m3-ppm*		*Short-term exposure limit mg/m3-ppm*		*Ceiling exposure limit mg/m3-ppm*		*Remark*	*Source*	*Year*
Chromium	7440-47-3	-	1	-	-	-	-	-	Metal	-	2016
Chromium (VI) inorganic compounds, water-soluble	7440-47-3	-	0,005	-	-	-	-	-	as Cr (VI)	-	2016
Chromium (VI) inorganic compounds, insoluble	7440-47-3	-	0,005	-	-	-	-	-	as Cr (VI)	-	2016
Copper	7440-50-8	-	0,1	-	-	-	-	-	Fume	-	2016
Iron	7439-89-6	-	10	-	-	-	-	-	Fume, as iron oxide	-	2016
Manganese	7439-96-5	-	-	-	-	-	5	-	Fume, as Mn	-	2016
Molyb-denum, metal and insoluble compounds	7439-98-7	-	15	-	-	-	-	-	Total dust, as Mo	-	2016
Molyb-denum, soluble compounds	7439-98-7	-	5	-	-	-	-	-	as Mo	-	2016
Nickel	7440-02-0	-	1	-	-	-	-	-	Elemental	-	2016
Silicon	7440-21-3	-	5	-	-	-	-	-	Respirable fraction	-	2016
Silicon	7440-21-3	-	15	-	-	-	-	-	Total dust	-	2016

8.2. Exposure controls

Not applicable

Other

Avoid exposure to welding fumes, radiation, spatter, electric shock, heated materials and dust.

Train welders to avoid contact with live electrical parts and insulate conductive parts.

Ventilation	Use respirator or air supplied respirator when welding or brazing in a confined space, or where local exhaust or ventilation is not sufficient to keep exposure values within safe limits. Ensure sufficient ventilation, local exhaust, or both, to keep welding fumes and gases from breathing zone and general area. Use special care when welding painted or coated steels since hazardous substances from the coating may be emitted.
Personal protective equipment	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. Check condition of protective clothing and equipment on a regular basis.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Steel rod
Appearance, colour	Varying color
Appearance, physical state	Solid
Auto-ignition temperature	Not applicable
Decomposition temperature	No data available
Evaporation rate	Not applicable
Explosive properties	Not applicable
Flammability (solid, gas)	Not applicable
Flash point	Not applicable
Initial boiling point and boiling range	No data available
Melting point	>1000°C / >1800ºF
Melting point / freezing point	Not applicable
Odour	Not applicable
Odour treshold	Not applicable

Oxidising properties	Not applicable
Partition coefficient: n-octanol / water	Not applicable
pH	Not applicable
pH value	Not applicable
Relative density	No data available
Solubility	No data available
Upper / lower flammability or explosive limits	No data available
Vapour density	Not applicable
Vapour pressure	Not applicable
Viscosity	Not applicable
Volatility	Not applicable

9.2. Other information

Not applicable

SECTION 10: Stability and reactivity

10.1. Reactivity

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

10.2. Chemical stability

Chemical stability	This product is stable under normal conditions.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	Not applicable

10.4. Conditions to avoid

Conditions to avoid	This product is only intended for normal welding purposes.

10.5. Incompatible materials

Incompatible materials	Not applicable

10.6. Hazardous decomposition products

Hazardous decomposition products	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 3 and those from the base metal and coating. The amount of fumes generated from this product varies with welding parameters and dimensions, but is generally no more than 1 to 10 g/kg consumable. Fumes from this product may contain compounds of the following chemical elements: Fe, O, Mn, Si, Cr, Ni, Mo, and Cu. The rest is not analyzed, according to available standards.

Other

Refer to applicable national exposure limits for fume compounds, including those exposure limits for fume compounds found in Section 8.

A significant amount of the chromium in the fumes can be hexavalent chromium, which has a very low exposure limit in some countries. Manganese and nickel also have low exposure limits, in some countries, that may be easily exceeded.
Reasonably expected gaseous products would include carbon oxides, nitrogen oxides and ozone. Air contaminants around the welding area can be affected by the welding process and influence the composition and quantity of fumes and gases produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on toxicological effects	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.
skin corrosion/irritation	Not applicable
serious eye damage/irritation	Not applicable
Respiratory/skin sensitization	Not applicable
germ cell mutagenicity	Not applicable
Genotoxicity	Not applicable
carcinogenicity	Not applicable
Repeated dose toxicity	Not applicable
reproductive toxicity	Not applicable
STOT-single exposure	Not applicable
STOT-repeated exposure	Not applicable
Harmful if inhaled	Not applicable

Other

Long term effect	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, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, disturbances and spastic gait.

SECTION 12: Ecological information

12.1. Toxicity

Not applicable

12.2. Persistence and degradability

Not applicable

12.3. Bioaccumulative potential

Not applicable

12.4. Mobility in soil

Not applicable

12.5. Results of PBT and vPvB assessment

Not applicable

12.6. Other adverse effects

Not applicable

Other

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.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

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.

SECTION 14: Transport information

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

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

Other regulations, limitations and legal regulations	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: 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.) CERCLA/SARA Title III Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs): 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 require 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 Toxic Chemicals: The following metallic components are listed as SARA 313 "Toxic Chemicals" and potential subject to annual SARA 313 reporting. See Section 3 for weight percent. Chromium: 1.0% de minimis concentration Copper: 1.0% de minimis concentration Manganese: 1.0% de minimis concentration Nickel: 0.1% de minimis concentration

15.2. Chemical safety assessment

Chemical safety assessment	No

Other

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. Use adequate ventilation.
ELECTRIC SHOCK can kill. ARC RAYS and SPARKS can injure eyes and burn skin.
Wear correct hand, head, eye and body protection.

SECTION 16: Other information

Changes to previous revision	This Safety Data Sheet has been revised due to modifications to Sections 1-16.

References to key literature and data sources	Refer to ESAB "Welding & 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 any questions about this SDS. USA: 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. USA: OSHA Publication 2206 (29 C.F.R. 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 USA: American Conference of Governmental Hygienists (ACGIH), Threshold Limit Values and Biological Exposure Indices, 6500 Glenway Ave., Cincinnati, Ohio 45211, USA. 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.
Phrase meaning	H317 - May cause an allergic skin reaction. H351 - Suspected of causing cancer. H372 - Causes damage to the lungs through prolonged or repeated exposure by inhalation.

Other

Additional information	ESAB requests the users of this product to study this Safety Data Sheet (SDS) 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 SDS and any product hazards/safety information. -furnish this same information to each of its customers for this product. -request such customers to notify employees and customers for the same product hazards and safety information. The information herein is given in good faith and based on technical data that ESAB believes to be reliable. Since the conditions of use is outside our control, we assume no liability in connection with any use of this information and no warranty, expressed or implied is given. Contact ESAB for more information.