



MSDS NO: STAINLESS STEEL ELECTRODE  
REVISED 11-2001

Substance	CAS No.	Exposure Limit (mg/m <sup>3</sup> )	
		OSHA PEL	ACGIH TLV
Iron Oxide	1309-38-2	5	10 (as Fe <sub>2</sub> O <sub>3</sub> )
Nickel Oxide	1313-99-1	Nothing Found	1 (as Ni)
Molybdenum	7439-98-7	15 (Mo)	10 (Mo), 20**
Manganese	7439-96-5	5*	1* (Fume)
Chromium Oxide	1308-38-9	0.5 (as Cr)	0.5 (Ox)
Chromic acid	1333-82-0	0.1*	0.05 (as Cr)
Silicon Oxide	7631-86-9	5	3
Titanium Oxide	13463-67-7	15	10, 20**
Calcium Oxide	1305-78-8	5 (as CaO)	2 (as CaO)
Columbian	7440-03-1	5	5
Fluorides	-	2.5 (as F)	2.5 (as F)
Nickel (Soluble)	-	1 (as Ni)	0.1 (as Ni)
Copper	7440-50-8	0.1 (as Fume)	0.2 (as Fume)

\*Ceiling Limit                \*\*Short Term Exposure Limit

Gaseous reaction products may include carbon monoxide and carbon dioxide  
Ozone and nitrogen oxides may be formed by the radiation from the arc.

One method of determining the composition and quantity of the fumes and gases to which the workers are exposed is to take an air sample from inside the welder's helmet while worn or within the worker's breathing zone. See ANSI/AWS F1.1 publication available from the American Welding Society 550 N.W. LeJeune Road, Miami, Florida 33126.

**SECTION VI- HEALTH HAZARD DATA**

**Threshold Limit Value:** The ACGIH recommended general limit for welding fume NOC (Not otherwise classified) is 5 mg/m<sup>3</sup>. ACGIH-1985 preface states: "The TLC-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations." See section V for specific fume constituents, which may modify this TLV.

**Common Entry is by Inhalation.**

**Effects of Overexposure:** Inhalation of welding fumes and gases can be dangerous to your health. Short-term (acute) overexposure to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat, or eyes. Chromium (VI) compounds present in the fume may cause abdominal pain, diarrhea, muscular weakness and convulsions. Continued inbalaation could cause loss of consciousness and death. Chromium (VI) compounds present in the fume may cause severe irritation of the bronchial tubes and lungs. Ingesting chromium (VI) salts may cause injury or death. Chromium (VI) compounds may burn eyes. Chromium compounds may cause allergic reactions in some people. Nickel oxides present in the fume may cause tightness around the chest, fever and allergic reactions in some people. Long-term (chronic) over-exposure to welding fumes can lead to siderosis (iron deposits in lung) and is believed to affect pulmonary function. Repetitive exposure to fluoride fumes and/or gases may cause excessive calcification of the bones and ligaments of the ribs, pelvis and spinal column. Constant inhalation of chromium (VI) compounds may cause an ulceration and perforation of the nasal septum as well as liver and kidney damage. Repetitive overexposure to nickel oxides may lead to lung fibrosis or pneumoconiosis. Workers exposed to chromium (VI) compounds and/or nickel oxides have a higher incidence of lung and nasal cancers. Chromium and nickel compounds are on the IARC (International Agency for Research of Cancer) list as posing a carcinogenic risk to humans.

Arc Rays can injure eyes and burn skin. Electric shock can kill. See Section VII

**Emergency and First Aid Procedures:** Call for medical assistance. Use first aid procedures recommended by the American Red Cross. If breathing is difficult - give oxygen. If not breathing-use CPR (cardiopulmonary resuscitation). Consult a physician if irritation of the eyes and skin or flash burns develops after exposure.

**Carcinogenicity**

OSHA (29 CFR 1910.1200) lists Nickel and Chromium as possible carcinogens.

**SECTION VII - CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE**

Read and understand the manufacturer's instructions and precautionary label on this product. See American Standard Z49.1 Safety in Welding and Cutting, published by the AMERICAN WELDING SOCIETY, 550 N.W. LeJeune Road, Miami, Florida 33126 and OSHA Publication 2206 (29 CFR 1910), U.S.Government Printing Office, Washington D.C. 20402 for more details on the following topics.

**Ventilation:** Use plenty of ventilation and/or local exhaust at the arc, to keep the fumes and gases below the threshold limit value within the worker's breathing zone and the general work area. Welders should be advised to keep their head out of the fumes.

**Respiratory Protection:** Use respirable fume respirator or air supplied respirator when welding in a confined space or general work area where local exhaust and/or ventilation does not keep exposure below the threshold limit value.

**Eye Protection:** Wear a helmet or face shield with a filter lens shade number 12-14 or darker. Shield other workers by providing screens and flash goggles.

**Protective Clothing:** Wear approved head, hand and body protection, which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z-49.1. This would include wearing welder's gloves and a protective face shield and may include arm protectors, apron, hats, shoulder protection, as well as dark substantial clothing. Welders should be trained not to allow electrically live parts to contract the skin or wet clothing and gloves. The welders should insulate themselves from the work and ground.

**Waste Disposal Method:** Discard any product, residue, disposal container, or liner in an environmentally acceptable manner approved by Federal, State and Local regulations.

Washington Alloy Co. believes that the information contained in this Material Safety Data Sheet (MSDS) is accurate. However, Washington Alloy Co. does not express or imply any warranty with respect to this information.