MATERIAL SAFETY DATA SHEET
For U.S. Manufactured or Distributed Welding Consumables and Related Products. May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910 .1200 Rev. October 1988
Date: 2010/01/01 MSDS No. 702

SECTION 1: IDENTIFICATION

Manufactured/Supplied by:	
Telephone Number	
Fax Number	
Product Type	COVERED ELECTRODE
Classification:	308/308L-16,309-16/309L 310-16,316/316L-16,410-16 347-16,307-16, E2209-16, E2553, E307-15, E308/308H-15, 16, 17, E308L15, 17, E309-15, 16, 17, E309CB-16, E309L-15, 16, 17, E309MO, 15, 16, E309MOL-16, E310 15,16, E310CB-16, E310H-15,16, E310MO-16, E312-16, E316/316H-15, 16, 17, E316L-15, 16, 17, E308LTO-1, E316LTO-1, E317-15,16,17, E318-16, E320-15,16, E320CR-15, E330-15, 16, E347-15,16,17

SECTION 2: HAZARDOUS MATERIAL (1)

IMPORTANT!

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section 5; see it for industrial hygiene information º

CAS Number shown is representative for the ingredients listed º

(1) The term "hazardous" in "hazardous Materials" should be interpreted as a term required and defined in the Hazard Communication Standard and does not necessarily imply the existence of any hazard º

HAZARDOUS INGREDIENTS:	CAS NUMBER	WEIGHT %	TVL (mg/m^3)	PEL (mg/m^3)
Titanium dioxides(as Ti)*****	13463-67-7	10	10	15
Limestone and/or calcium carbonate	1317-65-3	10	10	15
Silicates and other binders	1344-09-8	<5	10*	10*
Chromium and chromium alloys or compounds(as Cr)*****	7440-47-3	<5	0.5(b)	1.0(b)
Manganese and/or manganese alloys and compounds (as Mn)*****	7439-96-5	<5	0.2	1.0©
Fluorides(as F)	7789-75-5	<5	2.5	2.5
Iron oxides(as Fe)	65996-74-9	<5	5	10
Mineral silicates	1332-58-7	<5	5**	5**
Silicon and/or silicon alloys and compounds(as Si)	7440-21-3	0.5	10*	10*
Iron	7439-89-6	0.5	10*	10*
Nickel (metal)	7440-02-0	<0.5	1.5	1.5
Stainless steel core wire				
Nominal core wire composition				
Chromium*****	7440-47-3	20-26	0.5(b)	1.0(b)
Nickel*****	7440-02-0	10-21	1.5	1
Molybdenum (316 type only)	7439-98-7	2.5	10	10
Manganese*****	7439-96-5	2.0	0.2	1.0©
Iron	7439-89-6	Bal.	10*	10*

Supplemental information: (*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 mg/m^3. TLV value for iron oxide is 5 milligrams per cubic meter.

(**) As respirable dust.

(*****) Subject to the reporting requirements of Sections 311,312 and 313 of the Emergency Planning and Community Right-to-know Act of 1986 and 40CFR 370 and 372 º

(b) The OSHA PEL for chromium (VI) is 5 micrograms (0.005 milligrams) per cubic meter. The TLV for water soluble chromium (VI) is 0.05 milligrams per cubic meter and the TLV for insoluble chromium (VI) is 0.01 milligrams per cubic meter.

(c) Values are for manganese fume. STEL(Short Term Exposure Limit) is 3.0 milligrams per cubic meter. Values are those proposed by OSHA in 1989. Present PEL is 5.0 milligrams per cubic meter (ceiling value).

SECTION 3: HAZARD DATA

Non Flammable; Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section VI.

Product is inert, no special handling or spill procedures required. Not regulated by DOT.

SECTION 4: HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC-(Not Otherwise Classified) is 5 mg/m³.

ACGIG-1999 preface states that the TLV-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 5 for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards.

Fumes and gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea or dryness or irritation of nose, throat or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Chromates present in the fume have been known to cause severe irritation of the bronchial tubes and lungs. Asthma has been reported. Exposure to extreme cases can cause loss of consciousness and death.
Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. Chromates may cause ulceration and perforation of the nasal septum. Liver damage and allergic reactions, including skin rash, have been reported. Repeated exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. May cause skin rash. Chromium and nickel and their compounds are on the IARC (International Agency for Research on Cancer) and NTP (National Toxicology Program) Lists as posing a carcinogenic risk to humans.
WARNING: This product contains or produces a chemical known to the State of California to cause birth defects (or other reproductive harm) and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.*

Electric shock can kill. If welding must be performed in damp locations or with wet clothing on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.
EMERGENCY AND FIRST AID PROCEDURES: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
If breathing is difficult give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques. IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment.

SECTION 5: REACTIVITY DATA – HAZARDOUS DECOMPOSITION PRODUCTS:

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures and electrodes used.
Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).
When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above. Reasonably expected fume constituents of this product would include: Primarily – complex iron oxides and fluorides. Secondarily – complex oxides of calcium, chromium, magnesium, manganese, nickel, potassium, silicon, sodium and zirconium when used with recommended Lincolnweld fluxes. Primarily iron oxide, manganese oxide, and complex chromium oxides; secondarily complex oxides of molybdenum (316 types) and nickel when used with gas shielding.

Maximum fume exposure guideline for this product (based on CR(VI) content) is 0.8 milligrams per cubic meter for submerged arc and 3.0 milligrams per cubic meter (based on CR(III) content) when used with gas shielding for GMAW and 1.5 milligrams per cubic meter (based) on manganese content) when used for CTAW. See MSDS for flux being used.

The OSHA PEL (Permissible Exposure Limit) is a ceiling value that shall not be exceeded at any time.

Keep exposure as low as possible. Indoors, use local exhaust, outdoors, a respirator may be required.

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

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation of exposures are not below limits. See ANSI/AWS F1.1,F1.2,F1.3,F1.4 and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION 6 & 7: CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING & USE

Read and understand the manufacturer's instructions and the precautionary label on the product. Request Lincoln Safety Publication E205. See American National Standard Z49.1; Safety in Welding, Cutting and Allied Processes' published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29 CFR 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more detail on any of the following.

VENTILATION: Use enough ventilation, local exhaust at the arc or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. Keep exposure as low as possible.
RESPIRATORY PROTECTION: Use respirable fume respirator or air supplied respirator when welding in confined space or general work areas when local exhaust or ventilation does not keep exposure below TLV.
EYE PROTECTION: Wear helmet or use face shield with filter lens share number 12* or darker. Shield others by providing screens and flash goggles. (*) No specific recommendation for submerged arc.
PROTECTIVE CLOTHING: Wear hand, head and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include are protectors, aprons, hats, shoulder protection as well as dark substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin or clothing or gloves if they are wet. Insulate from work and ground.
WASTE DISPOSAL: Discard any product, residue, disposable container or liner as ordinary waste in an environmentally acceptable manner, in full compliance with Federal, State and Local regulations unless otherwise noted.