



L13-001

FORM NO. 7965

DATE: July, 1989

(Replaces F-7910A, 7912A, 7913 & 7914C)

MATERIAL SAFETY DATA SHEET

(Essentially Similar to U. S. Department of Labor Suggested Form For Hazard Communication Standard Compliance)

I. PRODUCT IDENTIFICATION

Product Type - Solid Steel Welding Electrodes
 Manufacturer - L-TEC Welding & Cutting Systems Telephone No. - 1-216-992-1265
 Address - 3325 Middle Road, Ashtabula, Ohio 44004 Emergency No. - 1-216-992-5186

Product Trade Name	COMPOSITION OF STEEL WIRES AND RODS													AWS Classification
	C	Mn	Si	Cu	Mo	Cr	Ni	Al	Ti	B	Zr	V	Fe	
1	.10	1.10	.25	---	---	---	---	---	---	---	---	---	Bal.	A5.2, R60
7	.05	.30	.03	<.50	---	---	---	---	---	---	---	---	Bal.	A5.2, R45
29	.10	1.00	.25	<.50	---	---	---	---	---	---	---	---	Bal.	A5.17, EM12K
29S	.10	1.10	.50	<.50	---	---	---	---	---	---	---	---	Bal.	A5.17, EM13K;A5.18,ER70S-3
32CMS	.12	1.10	.25	<.50	---	.30	---	---	---	---	---	---	Bal.	A5.2, R65
36	.14	2.00	.03	<.50	---	---	---	---	---	---	---	---	Bal.	A5.17, EH14
40	.15	2.00	.03	<.50	.50	---	---	---	---	---	---	---	Bal.	A5.23, EA3
40A	.08	.85	.03	<.50	.50	---	---	---	---	---	---	---	Bal.	A5.23, EA1
40B	.10	1.20	.03	<.50	.50	---	---	---	---	---	---	---	Bal.	A5.23, EA2
44	.13	2.00	.05	<.50	.50	---	.65	---	---	---	---	---	Bal.	A5.23, EF2
65	.05	1.10	.50	<.50	---	---	---	<.10	<.10	---	<.10	---	Bal.	A5.18, ER70S-2
80	.10	.45	.03	<.50	---	---	---	---	---	---	---	---	Bal.	A5.17, EL12
	.10	1.00	.25	<.50	---	---	---	---	---	---	---	---	Bal.	A5.17, EM12K
32	.10	1.10	.50	<.50	---	---	---	---	---	---	---	---	Bal.	A5.18, ER70S-3;A5.17,EM13K
83	.10	1.90	.65	<.50	.50	---	---	---	---	---	---	---	Bal.	A5.28, ER80S-D2
85	.10	1.25	.75	<.50	---	---	---	---	---	---	---	---	Bal.	A5.18, ER70S-4
86	.10	1.65	.95	<.50	---	---	---	---	---	---	---	---	Bal.	A5.18, ER70S-6
87HP	.10	1.65	.65	<.50	---	---	---	---	---	---	---	---	Bal.	A5.18, ER70S-7
91	.05	1.80	.20	<.50	.60	---	---	<.10	<.20	<.10	---	---	Bal.	None
95	.06	1.65	.35	<.50	.40	.10	1.70	---	<.10	---	---	---	Bal.	A5.23, EM2; A5.28, ER100S-1
100	.15	2.00	.10	<.90	.50	.35	2.60	---	---	---	---	---	Bal.	A5.23, EF5
120	.06	1.60	.35	<.50	.50	.35	2.40	---	<.10	---	---	---	Bal.	A5.23, EM4; A5.28, ER120S-1
131	.06	1.50	.50	<.50	.70	---	3.50	---	---	---	---	---	Bal.	None
133	.12	2.00	.10	<.50	.70	---	2.60	---	---	---	---	---	Bal.	None
140	.10	1.60	.40	<.50	.90	.70	2.60	---	<.10	---	---	---	Bal.	None
551	.20	.60	.50	<.50	1.00	.50	---	---	---	---	---	---	Bal.	A5.23, EB5
EG	.05	1.10	.50	<.50	---	---	---	---	---	---	---	---	Bal.	None
ENi4	.15	.70	.20	<.50	.15	---	1.80	---	---	---	---	---	Bal.	A5.23, ENi4
HI-84	.10	1.90	.65	<.50	.50	---	---	---	<.10	---	---	---	Bal.	A5.28, ER80S-D2
MW	.45	1.00	.75	---	.10	.80	---	---	---	---	---	<.10	Bal.	None
U515	.10	.65	.15	<.50	.50	1.50	---	---	---	---	---	---	Bal.	A5.23, EB2
U521	.10	.65	.15	<.50	1.00	2.75	---	---	---	---	---	---	Bal.	A5.23, EB3
WS	.10	.50	.30	<.90	---	.60	.60	---	---	---	---	---	Bal.	A5.23, EW
X-140	.10	1.90	.35	<.50	.70	.95	2.30	---	<.10	---	---	---	Bal.	None

L-TEC requests the users of these products to study this Material Safety Data Sheet (MSDS) and become aware of the product hazards and safety information. To promote the safe use of these products a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for these products and (3) request such customers to notify their employees and customers, for these products, of the same product hazards and safety information.

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II. HAZARDOUS INGREDIENTS

Important! This section covers the materials from which this product is manufactured. The fumes and gases produced during normal use of these products are covered in Section V. The term HAZARDOUS should be interpreted as a term required and defined by Laws, Statutes or Regulations, and does not necessarily imply the existence of any hazard when the products are used as directed by L-TEC.

Material (CAS No.)	SARA	ACGIH TLV (1988-89)		OSHA - PEL (1989)		
		TWA	(mg/m ³)	TWA	(mg/m ³)	STEL (mg/m ³)
Aluminum (7429-90-5)	*	5	(Welding Fume)	5	(Welding Fume)	---
Boron (7440-42-8)		10	(Oxide)	5	(Oxide Respirable)	---
Carbon (7440-44-0)		3.5	(C. Black)	3.5	(C. Black)	---
Chromium (7440-47-3)	*	0.5	(Metal)	1	(Metal)	---
		0.05	(Cr VI)	0.1	(as Chromate)	---
Copper (7440-50-8)	*	0.2	(Fume)	0.1	(Fume)	---
Iron (7439-89-6)		5	(Oxide Fume)	10	(Oxide Fume)	---
Manganese (7439-96-5)	*	1	(Fume)	1	(Fume)	3
Molybdenum (7439-98-7)		5	(Soluble)	5	(Soluble)	---
Nickel (7440-02-0)	*	0.1	(Soluble)	0.1	(Soluble)	---
Silicon (7440-21-3)		10		5	(Respirable Fraction)	---
Titanium (7440-32-6)		10	(TiO ₂)	5	(TiO ₂ - Respirable)	---
Vanadium (1314-62-1)	*	0.05	(V ₂ O ₅)	0.05	(V ₂ O ₅ Fume)	---
Zirconium (7440-67-7)		5		5		10

NOTE: In the ingredients table, an asterisk (*) after the CAS number indicates a toxic chemical subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (SARA) and 40 CFR Part 372.

Some of these products may not contain all of the materials listed. For details of composition refer to the COMPOSITION TABLE in Section I.

In the table above "C" indicates "Ceiling Limit".

III. PHYSICAL DATA

As shipped, these products are nonflammable, nonexplosive, nonreactive, and nonhazardous.

Physical State: GAS () LIQUID () SOLID (X)

Odor and Appearance: Copper coated, or bare, solid wire or rod, odorless

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IV. FIRE & EXPLOSION HAZARD

Flammable/Explosive: No (X) YES ()

Under what conditions? Only the packaging for this product will burn

Extinguishing Media: This product will not burn. However, welding arcs and sparks can ignite combustible and flammable materials. Use the extinguishing media recommended for the burning materials and fire situation. See ANSI Z49.1 "Safety in Welding and Cutting" and "Safe Practices" Code: SP, published by the American Welding Society, PO Box 351040, Miami, FL 33135, and NFPA 51B "Cutting and Welding Processes", published by the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269 for additional fire prevention and protection information.

V. REACTIVITY DATA

Stability: Stable (X) Unstable () Polymerization will not occur

Incompatible products: None currently known

Hazardous decomposition products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the material being worked, the process, procedures and consumables 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 material being worked (such as paint, plating or galvanizing), the number of welding operations and the volume of the work area, the quality and amount of ventilation, the position of the workers head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning or painting activities). When the materials are consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation of the ingredients, plus those from the material being worked and the coatings etc. noted above.

Reasonably expected decomposition products from normal use of these products include a complex of the oxides of the materials listed in Section II, as well as carbon monoxide, carbon dioxide, ozone and nitrogen oxides (refer to "Characterization of Arc Welding Fume" available from the American Welding Society). The only way to determine the true identity of the decomposition products is by sampling and analysis. The composition and quantity of the fumes and gases to which a worker may be overexposed can be determined from a sample obtained from inside the welders helmet, if worn, or in the workers breathing zone. See ANSI/AWS F1.1 "Method for Sampling Airborne Particles Generated by Welding and Allied Processes", available from the American Welding Society.

VI. PHYSICAL AND HEALTH HAZARD DATA

Electric arc working may create one or more of the following health or physical hazards. Fumes and gases can be dangerous to your health. Electric shock can kill you. Arc rays can injure eyes and burn skin. Noise can damage hearing. An additional detailed description of the Health and Physical hazards and their consequences may be found in L-TEC's free publications F52-529 "Precautions and Safe Practices for Electric Welding and Cutting" and F2035 "Precautions and Safe Practices for Gas Welding, Cutting and Heating". You may obtain copies from your local supplier, or by writing to the address in Section I.

Route of overexposure: The primary route of entry of the decomposition products is by inhalation. Skin contact, eye contact, and ingestion are possible. Absorption by skin contact is unlikely. When these products are used as recommended by L-TEC, and ventilation maintains exposure to the decomposition products below the limits recommended in this section, overexposure is unlikely.

Effects of acute (short term) overexposure to the gases, fumes and dusts may include irritation of the eyes, lungs, nose and throat. Some toxic gases associated with welding may cause pulmonary edema, asphyxiation, and death. Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, difficulty in breathing, frequent coughing, or chest pain. Acute overexposure to copper fumes may result in metal fume fever, metallic taste, nausea and irritation of the upper respiratory tract. The presence of chromium/chromate in fume can cause irritation of nasal membranes and skin. The presence of nickel compounds in fume can cause metallic taste, nausea, tightness of chest, fever and allergic reaction.

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Effects of chronic (long term) overexposure to air contaminants may lead to their accumulation in the lungs, a condition which may be seen as dense areas on chest x-rays. The severity of the change is proportional to the length of the exposure. The changes seen are not necessarily associated with symptoms or signs of reduced lung function or disease. In addition, the changes on x-rays may be caused by non-work factors such as smoking, etc. Nickel and chromium (in some products) are considered carcinogenic. Long term overexposure to nickel fumes may also cause pulmonary fibrosis and edema.

Pre-existing Medical Conditions Aggravated by Overexposure: Individuals with allergies or impaired respiratory function may have symptoms worsened by exposure to welding fumes. However such reaction cannot be predicted due to the variation in composition and quantity of the decomposition products.

Exposure limits for the ingredients are listed in Section II. The 1989 OSHA TWA for welding fume is 5 mg/m³. TLV-TWA's should be used as a guide in the control of health hazards and not as fine lines between safe and excessive concentrations. When these products are used as recommended by L-TEC, and the preventive measures taught in this MSDS are followed, overexposure to hazardous substances will not occur.

Emergency First Aid Measures: In case of emergency call for medical aid. Employ first aid technique recommended by the Red Cross. IF BREATHING IS DIFFICULT give oxygen and call for a physician. FOR ELECTRIC SHOCK disconnect and turn off the power. If not breathing begin artificial respiration, preferably mouth-to-mouth. If no detectable pulse begin Cardio Pulmonary Resuscitation (CPR). Immediately call a physician. FOR ARC BURN apply cold, clean compresses and call a physician.

Carcinogenic Assessment (NTP Annual Report, IARC Monographs, Other): Nickel and Chromium must be considered possible carcinogens under OSHA (29CFR1910.1200). IARC has indicated Nickel, Chromium, and certain of their compounds are probably carcinogenic for humans, but the compounds cannot be specified precisely. Their conclusions were drawn from operations different from welding. Regardless, exposure level must be kept below those levels specified in Section II.

VII. PRECAUTIONS FOR SAFE HANDLING & USE

Spill or Leak Procedures - Waste Disposal: Prevent waste from contaminating the surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations.

Personal Protection: Be sure to read and understand the manufacturer's instructions, recommended practices and all precautionary labels before use of these products. Keep your head out of the fumes. Do not breathe the fumes and gases caused by the arc. Use enough ventilation to reduce exposure to the acceptable levels listed in Section II. Air samples can be used to find out what respiratory protection is needed. Do not touch live electric parts. Wear correct ear, eye and body protection such as ear plugs for noise, safety glasses and eye shields for radiation and flying particles, and gloves, hats, aprons, safety shoes etc. for protection from sparks, spatter, and radiation. See ANSI Z49.1 for additional guidelines. Use a respirable fume respirator or air supplied respirator when welding or cutting in a confined space or where exhaust or ventilation does not keep exposure below the limits recommended in Section II.

Training in proper safe work practices is the most effective protective measure against the hazards of welding and cutting. The users of these products should follow OSHA 29CFR1910.1200 training guidelines. The free L-TEC "Precautions and Safe Practices" offered in Section VI can assist you in your training program.

Ventilation - Specific Engineering Controls: Use enough ventilation, local exhaust, or both, at the arc to keep the fumes and gases below recommended exposure limits. Train workers to keep their heads out of the fumes. Avoid arc work in the presence of chlorinated hydrocarbon vapors. Phosgene may be produced by action of the radiant energy of the arc. Avoid arc working of parts coated with phosphate residues (anti-rust, cleaning preparations). Phosphine may be produced.

The opinions expressed in this MSDS are those of qualified experts within L-TEC. We believe that the information contained herein is current as of the date of this MSDS. Since the use of this information and these opinions and the conditions of use of these products are not within the control of L-TEC, it is the user's obligation to determine the conditions of safe use of these products.