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FORM NO. 7962 *88976*

DATE: July, 1989

(Replaces F-7900, 7901, 7902C, 7903B & 7906)

MATERIAL SAFETY DATA SHEET

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

I. PRODUCT IDENTIFICATION

Product Type - Fluxes for Gas Welding

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 NAMES & COMPOSITIONS

Ingredients	Brazo Flux	Ferro Flux	Cast Iron Flux	Cromaloy Flux	Aluminum Flux
Borax	<85	<35	<10	<20	---
Boric Acid	<20	---	<35	---	---
CaF ₂	---	---	---	<35	---
Ca Silicate	---	---	---	<50	---
Copper	---	---	30	---	---
iron Oxide	---	<5	<5	---	---
Kaolin	---	---	---	<15	---
Li F	---	---	---	---	<15
KCl	---	---	---	---	<50
Sodium Carbonate	---	<60	---	---	---
NaCl	---	---	---	---	<50
Sodium Sesquicarbonate	---	<10	---	---	---
Zinc	---	---	30	---	---

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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)
Borax (1330-43-4)		1		10	----
Boric Acid (10043-35-3)		10 (B ₂ O ₃)		5 (B ₂ O ₃) Respirable	----
Calcium Fluoride (7789-75-5)		2.5 (as F)		2.5 (as F) in ppm	----
Calcium Silicate (10101-39-0)		----		5 (Respirable)	----
Copper (7440-50-8)	*	0.2 (Fume)		0.1 (Fume)	----
Iron Oxide (1309-37-1)		5		10 (Fume)	----
Kaolin (1332-58-7)		10		5 (Respirable Fraction)	----
Lithium Fluoride (7789-24-4)		2.5 (as F)		2.5 (as F) in ppm	----
Potassium Chloride (7447-40-7)		----		----	----
Sodium Carbonate (497-19-8)		----		----	----
Sodium Chloride (7647-14-5)		----		----	----
Sodium Sesquicarbonate (533-96-0)		----		----	----
Zinc (7440-66-6)	*	5 (Oxide Fume)		5 (Oxide Fume)	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.

III. PHYSICAL DATA

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

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

Odor and Appearance:
 Brazo Flux - White Powder, odorless
 Ferro Flux - Reddish Powder, odorless
 Cast Iron Flux - Reddish Powder, odorless
 Cromaloy Flux - Off-White Powder, odorless
 Aluminum Flux - White Powder, odorless

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IV. FIRE & EXPLOSION HAZARD

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Flammable/Explosive: No (X) YES ()

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Special Fire Fighting Procedures: Aluminum Flux will produce toxic fumes, when heated. Use full protective equipment.

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: Brazo Flux & Ferro Flux - Acetic Anhydride, Elemental Potassium
Cast Iron Flux - Acetic Anhydride, Elemental Potassium, acids
Cromaloy Flux - Acetic Anhydride, Elemental Potassium, Cyanides
Aluminum Flux - Strong Acids, Cyanides and Sulfides

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, and nitrogen oxides (refer to "Characterization of Arc Welding Fume" available from the American Welding Society). Aluminum Flux will give off HCl and HF in the presence of water and heat. 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

Dust, fumes and gases can harm your health. Heat rays from the flame or hot metal can injure eyes. Flux can cause eye damage or skin irritation. Swallowing flux can cause injury. 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:

Brazo & Ferro Flux:

Acute Effects - Fume may irritate the respiratory system. Sneezing and coughing may result.

Chronic Effects - CNS effects, erythema

Aggravation of Pre-Existing Medical Conditions - skin and respiratory disorders may be worsened by over exposure.

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Cast Iron Flux:

Acute Effects - Fumes may irritate the respiratory system. Sneezing and coughing may result. Exposure to copper and zinc oxide fumes may cause metal fume fever, symptoms of which are a metallic taste, coughing, shortness of breath, nausea, fever, and chills.

Chronic Effects - CNS effects, erythema

Aggravation of Pre-Existing Medical Conditions - skin and respiratory disorders may be worsened by overexposure.

Crómalo Flux:

Acute Effects - Fumes may irritate the respiratory system. Sneezing and coughing may result.

Chronic Effects - Can cause lung damage (silicosis), CNS effects and erythema. Chronic fluoride absorption can result in osseous fluorosis.

Aggravation of Pre-Existing Medical Conditions - skin and respiratory disorders may be worsened by overexposure.

Aluminum Flux:

Acute Effects - Fumes may irritate the respiratory system. Chemical burns upon skin contact are possible.

Chronic Effects - Can cause lung damage, CNS and kidney effects possible. Exposure to Lithium may result in neuromuscular effects, hyperactive reflexes and weight loss. Chronic fluoride absorption can result in osseous fluorosis.

Aggravation of Pre-Existing Medical Conditions - skin and respiratory disorders may be worsened by overexposure.

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 skin contact promptly flush with water for at least 15 minutes to remove all residue. If rash develops, call a physician. For eye contact remove contact lenses. Flush with water for at least 15 minutes. Get medical attention.

Carcinogenic Assessment (NTP Annual Report, IARC Monograph, Other): None currently listed.

VII. PRECAUTIONS FOR SAFE HANDLING AND 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 flame. 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. 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. Wear Chemically impervious gloves and eye shields when handling flux. 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 flame to keep the fumes and gases below recommended exposure limits.

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.