SAFETY DATA SHEET

Protective Clothing	NFPA Rating (USA)	EC Classification	WHMIS (Canada)	Transportation
		 Toxic  Corrosive	 D1B  D2A  Corrosive	**May be shipped as a Consumer Commodity** (See Section 14)

Section 1: Product and Company Information

Product Name: Silver Brazing Flux Paste

Product Codes: 22035, 22395, 22307, 22302

Product Use: High Heat Resistant Flux Paste

Manufacturer: LA-CO Industries, Inc.
1201 Pratt Boulevard
Elk Grove Village, IL.
60007-5746

Phone Number: (847) 956-7600
Fax: (847) 956-9885

24-hour Emergency: **CHEMTREC: (800) 424-9300**

Section 2: Composition and Ingredient Information

Hazardous Ingredients:

Chemical Name	CAS No.	Wt.%	EINECS / ELINCS	Symbol	Risk Phrases
Boric acid	10043-35-3	30 - 40	233-139-2	T	Repr. Cat. 2 R60-61
Potassium hydrogendifluoride	7789-29-9	15 - 35	232-156-2	T; C	R25 - 34
Potassium tetraborate	1332-77-0	5 - 10	215-575-5	None*	None
Potassium fluoride	7789-23-3	5 - 10	232-151-5	T	R23/24/25

* This chemical substance is not classified in the Annex I of Directive 67/548/EEC.
Note: See Section 16 for the full text of the R-phrases above.

Section 3: Hazards Identification

Preparation Hazards and Classification:

Toxic by inhalation, in contact with skin and if swallowed. Causes burns.

USA: This material is considered hazardous by the OHSA hazard Communication Standard (29 CFR 1910.1200).

Canada: This is a controlled product under WHMIS.

European Communities (EC): This preparation is classified as dangerous according to Directive 1999/45/EC. Classifications: Toxic and Corrosive.

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Section 3: Hazards Identification, continued

Appearance, Color and Odor: White paste, odorless

Primary Route(s) of Exposure: Inhalation, Eye contact, Skin contact, Ingestion. Exposure may be from contact to product as packaged and from particulates generated during use.

Potential Health Effects: **ACUTE (short term): see Section 8 for exposure controls**

Inhalation: Inhalation of particulates from the flux can be moderately to severely irritating to the nose, throat and respiratory system. Symptoms of over-exposure include coughing, sneezing and difficulty breathing. Extreme over-exposure by inhalation to particulates may cause toxic effects similar to those described for Ingestion.

Ingestion: Toxic if swallowed. May cause nausea, vomiting and diarrhea. Ingestion may result in damage to the tissues of the gastrointestinal system and systemic fluoride toxicity, which may be fatal. Symptoms of acute toxicity may include excitement or depression; lethargy; seizures; coma; dehydration; kidney failure; arrhythmias; shock; cyanosis; low blood pressure; and metabolic acidosis.

Skin: Severely irritating or corrosive to the skin. Causes burns with direct contact. Thermal decomposition of this product may result in the release of hydrogen fluoride. This substance may be absorbed through the skin, causing burns. Extreme over-exposure to hydrogen fluoride can be fatal through systemic fluoride poisoning.

Eye: Product is irritating to the eyes. Causes eye burns with direct eye contact.

CHRONIC (long term): see Section 11 for additional toxicological data

Prolonged or repeated over-exposure by skin contact may cause dermatitis.

Long-term over-exposure to fluorides can cause a deposit of fluorides in the bones and teeth, a condition called Fluorosis. This may cause pain, disability and mottling of the teeth. Fluorides can irritate the lungs and may cause bronchitis to develop with cough, phlegm and/or shortness of breath.

Long-term over-exposures to inorganic borate compounds by inhalation or ingestion may impair fertility and may cause harm to the unborn child.

Medical Conditions Aggravated by Exposure: May aggravate an existing dermatitis.

Section 4: First Aid Measures

Inhalation: To ensure your own safety before attempting rescue (e.g. Wear appropriate protective equipment, use the buddy system). Get immediate medical attention. Remove source of contamination or move victim to fresh air. If breathing is stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately. Immediately transport victim to an emergency care facility.

Eye Contact: Get immediate medical attention. Quickly and gently blot or brush away any chemical. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 20-30 minutes while holding the eyelids open. Neutral saline solution may be used as soon as it is available. Do not interrupt flushing. If necessary, keep emergency vehicle waiting. Take care not to rinse contaminated water into the unaffected eye or onto the face. If irritation persists, repeat flushing. Quickly transport victim to an emergency care facility.

Skin Contact: Quickly and gently blot or brush away excess chemical. Remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Flush contaminated area with lukewarm, gently flowing water for at least 20-30 minutes. If irritation persists, repeat flushing. Do not interrupt flushing. If necessary, keep emergency vehicle waiting. Get medical attention if irritation or other symptoms occur.

Ingestion: Get immediate medical attention. Never give anything by mouth if victim is rapidly losing consciousness or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. Do not induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration. Quickly transport victim to an emergency care facility.

Notes to Physician: Fluorides can reduce serum calcium resulting in potentially fatal hypocalcemia; if there are indications that a victim is suffering from the effects of fluoride over-exposure, then give soluble calcium or magnesium. Potassium can reduce blood pressure and cause coma.

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Section 5: Fire Fighting Measures

Extinguishing Media: Use water spray to cool fire-exposed flux. Use carbon dioxide, halon, foam and dry chemical for extinguishing fires involving this flux.

Unusual Fire and Explosion Hazards: The flux paste is not flammable.

Sensitivity to mechanical impact: Not sensitive
Sensitivity to static discharge: Not sensitive

Fire Fighting Instructions: Self-contained breathing apparatus and full protective clothing should be worn. This material is corrosive to skin and presents a potential contact hazard to firefighters.

Hazardous Combustion Products: During a fire, irritating and toxic gases may be generated. Toxic gases may include hydrogen fluoride, potassium oxides, fluorine and boron compounds. Hydrogen fluoride can penetrate the skin causing skin burns and systemic toxic effects.

Section 6: Accidental Release Measures

Personal Precautions: Wear all protective equipment. Keep unauthorized personnel away. Ventilate the area.

Environmental Precautions: Do not allow product to reach sewage systems or ground water.

Methods for Containment: Stop the spill if it is safe to do so.

Methods for Clean-up: Scrape or scoop up the spilled material carefully, avoiding the generation of airborne dust. Put spilled material in suitable, labeled plastic waste container.

Section 7: Handling and Storage

Handling All employees who handle this material should be trained to handle it safety. Avoid breathing fumes and particulates of this material. Prevent all skin and eye contact. Do not ingest. Keep away from children. Use this material with adequate ventilation. Keep container closed when not in use. Wash thoroughly after handling this product. Do not eat, drink, smoke while handling this product. Remove contaminated clothing immediately.

Storage: Store in a cool, dry area. Keep containers tightly closed when not in use. Store away from acids. Keep away from sunlight sources of heat.

Section 8: Exposure Controls and Personal Protection

Exposure Limits

Ingredient	ACGIH TLV (8-hr. TWA) (mg/m^3)	U.S. OSHA PEL (8-hr. TWA) (mg/m^3)	Ontario (Canada) TWAEV (mg/m^3)	UK OEL (8-hr. TWA) (mg/m^3)
Borate compounds, inorganic	2 (inhalable) STEL: 6 (inhalable)	Not established	Not established	1
Fluoride, inorganic as F	2.5 BEI	2.5	2.5	2.5

SAFETY DATA SHEET

Section 8: Exposure Controls and Personal Protection, continued

Exposure Controls

Engineering Controls: Provide adequate ventilation/local exhaust to keep exposure levels below the exposure limits listed above.

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 or Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

Personal Protection:

Respiratory Protection: Where the potential exists for exposure over the 2.5 mg/m^3 as fluoride, use a MSHA/NIOSH approved supplied-air respiratory with a full facepiece operated in a pressure-demand or other positive pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.

Skin Protection: Wear impervious protective gloves made of natural rubber, neoprene or nitrile rubber. Wear clean body-covering clothing to prevent skin contact. Wear an impervious apron as needed to prevent skin contact.

Eye Protection: Wear safety glasses with side shields or chemical splash goggles and a full faceshield. Protective eyewear must be appropriate to the occupational use of the flux.

Other Protective Equipment: Provide eyewash and safety shower stations in workplaces where this flux is handled.

Hygiene Measures: Avoid breathing fumes and particulates of this material. Prevent all skin and eye contact. Do not ingest. Use this material with adequate ventilation. Keep container closed when not in use. Wash thoroughly after handling this product. Do not eat, drink, smoke while handling this product. Remove contaminated clothing immediately.

Section 9: Physical and Chemical Properties

Physical State:	Paste	**Vapor Pressure: (mm Hg @ 25°C)**	Not available
Appearance:	White paste	**Vapor Density: (Air = 1)**	Not available
pH:	8 - 10	**Solubility in Water:**	Water soluble
Relative Density: (water = 1)	1.6 – 1.7	**Water / Oil distribution coefficient:**	>1
Boiling Point:	100°C (212°F)	**Odor Type:**	Odorless
Freezing Point:	Not available	**Odor Threshold:**	Not applicable
Viscosity:	Not available	**Evaporation Rate: (n-Butyl Acetate = 1)**	Not available
Oxidizing Properties:	Not available	**Auto Ignition Temperature (°C):**	Not available
Flash Point and Method:	Not available	**Flammability Limits (%):**	Not available
VOC %:	0% (w/w%); 0% (v/v%)	**VOC:**	0 lbs per gallon (US)

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Section 10: Stability and Reactivity

Stability: Stable at normal temperature

Conditions to Avoid: Avoid extreme temperatures, moisture and incompatible materials.

Incompatible Materials: Incompatible with strong oxidizing agents, strong acids and bases, and reactive halogens.

Hazardous Decomposition Products: Thermal decomposition of this product may result in the release of hydrogen fluoride. This substance may be absorbed through the skin, causing burns. Extreme over-exposure to hydrogen fluoride can be fatal through systemic fluoride poisoning.
Other thermal decomposition products may include fluorine, boron and potassium compounds.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Section 11: Toxicological Information

Acute Toxicity Data

Ingredient	LD_{50} Oral (mg/kg)	LD_{50} Dermal (mg/kg)	LC_{50} Inhalation (4 hrs.)
Boric acid	3450 (mouse) 5 140 (rat)	Not available	Not available
Potassium hydrogendifluoride	Not available	Not available	Not available
Potassium tetraborate	3 500 (rat)	>2 000 (rabbit)	Not available
Potassium fluoride	245 (rat)	Not available	Not available

Chronic Toxicity Data

Carcinogenicity: ACGIH (American Conference of Governmental Industrial Hygienists) has listed Borate compounds, inorganic and Fluorides as A4 – Not Classifiable as a Human Carcinogen. IARC (International Agency for Research on Cancer) has listed Fluorides in Group 3 – Not classifiable as to carcinogenicity in humans.

Irritation: Severely irritating or corrosive when in contact with skin and eyes.

Sensitization: Not available

Neurological Effects: Toxic effects from over-exposure by ingestion, skin contact or by inhalation of hydrogen fluoride may cause adverse neurological effects.

Teratogenicity: Animal tests indicate that ingestion of inorganic borate compounds can cause damage to the fetus.

Reproductive Toxicity: Animal ingestion studies at high doses indicate that borates cause reproductive and developmental effects. Occupational exposure (10 years or greater) to boron aerosols (22-80 mg/m3) in males engaged in the production of boric acids caused impaired fertility.

Mutagenicity (Genetic Effects): Not available

Toxicologically Synergistic Materials: Not available

Target Organ Effects: Exposure to fluorides can affect the skin, bones, nervous system and teeth.

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Section 12: Ecological Information

Ecotoxicity: Not available.
Do not allow the material to be released into the environment.
If flux is released into the aquatic environment, it is expected to have toxic effects on aquatic plants, fish and invertebrates.

Mobility: Not available

Persistence and degradability: Not available

Bioaccumulative potential: Not available

Other adverse effects: Not available

Section 13: Disposal Considerations

Waste Disposal Method: Do NOT dump into any sewers, on the ground or into any body of water. Store material for disposal as indicated in Section 7 Handling and Storage.

USA: Dispose of in accordance with local, state and federal laws and regulations.
RCRA Waste Codes: None

Canada: Dispose of in accordance with local, provincial and federal laws and regulations.

EC: Waste must be disposed of in accordance with relevant EC Directives and national, regional and local environmental control regulations. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

Section 14: Transport Information:

U.S. Hazardous Materials Regulation (DOT 49CFR): When packaged in quantities less than 30 kg, this material can be shipped as a “Consumer Commodity ORM-D” Exemption. Shipment from US going to Canada may transport as per 49 CFR (TDG Section 9.1)

Canadian Transportation of Dangerous Goods (TDG): When packaged in quantities less than 30 kg this material can be shipped as a “Consumer Commodity” as per part 1.17 of the TDG Regulations. Shipment from Canada to the US may transport as per TDG Regulations (49 CFR Part 171.12a)

ADR/RID: When packaged in quantities less than 6 kg this material can be shipped in Limited Quantities as per 3.4.5 or the ADR.
Label outer package with: UN1740

IMDG: HYDROGENDIFLUORIDES N.O.S., (Potassium bifluoride), 8, UN1740, PGIII, LTD QTY, EmS F-A, S-B

Marine Pollutants: Not applicable

ICAO/IATA : ID8000, Consumer Commodity, 9

May be carried under the provisions for dangerous goods in limited quantities.

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Section 15: Regulatory Information

NFPA Hazard Rating

Category	NFPA
Acute Health	3
Flammability	0
Instability	0

USA

TSCA Status: All ingredients in the product are listed on the TSCA inventory.

SARA Title III:

Sec. 302/304: None
Sec: 311/312: Immediate health effects; Delayed health effects
Sec. 313: None
CERCLA RQ None

California Prop. 65 : This product does not contain chemicals known to the State of California to cause cancer or reproductive toxicity.

BXA : Potassium bifluoride appears on the Bureau of Export Administration list of Precursors for Toxic Chemical Agents, classified under Export Control Classification Number 1C350.

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the MSDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification:

D1B: Material causing immediate and serious toxic effects.
D2A: Materials causing other toxic effects.
E: Corrosive

NSNR Status (New Substance Notification Regulations): All substances in the product are listed, as required, on Canada's Domestic Substances List (DSL).

NPRI Substances (National Pollutant Release Inventory): The potential thermal decomposition product, Hydrogen fluoride, is a NPRI reportable substance. None of the ingredients, as listed in Section 2 are NPRI reportable substances.

CEPA Priorities Substances List : Potassium fluoride (as inorganic fluoride) is listed on Priority list 1, Toxic material.

EC Classification for the Substance/Preparation:

Symbol:

Toxic Corrosive

Risk Phrases:

R23/24/25: Toxic by inhalation, in contact with skin and if swallowed.
R34: Causes burns.
Repr. Cat. 2 R60-61: May impair fertility. May cause harm to the unborn child.

Safety Phrases:

1/2: Keep locked up and out of the reach of children.
22: Do not breathe dust.
26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
37: Wear suitable gloves.
45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S53: Avoid exposure – obtain special instructions before use.

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Section 16: Other Information

Full Text of R-phrases appearing in Section 2:

R23/24/25: Toxic by inhalation, in contact with skin and if swallowed.
R25: Toxic if swallowed.
R34: Causes burns.
R60-61: May impair fertility. May cause harm to the unborn child.

Preparation Information:

Revision Date:

April 4, 2011

Revision Summary:

May 26, 2006: Original Preparation Date
March 5, 2008: Updated Exposure Limits (Section 8) and Toxicological Information (Section 11).
April 4, 2011: Revision Section 3, Boric acid, EU DSD classification. Section 8, Occupational Exposure Limits. Section 11, Reproductive effects.

Manufacturer Disclaimer:

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