








MATERIAL SAFETY DATA SHEET

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

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/Dangerous Ingredients:

<u>Chemical Name</u>	<u>CAS No.</u>	<u>Wt.%</u>	<u>EINECS / ELINCS</u>	<u>Symbol</u>	<u>Risk Phrases</u>
Boric acid	10043-35-3	30 - 40	233-139-2	None*	None
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 8 of this MSDS for exposure limit data for these ingredients.
 See Section 16 for the full text of the R-phrases above.

MATERIAL SAFETY DATA SHEET**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 OSHA 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 and its amendments. Classifications: Toxic and Corrosive.

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.

Ingestion: Toxic by ingestion. 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.

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.

Medical Conditions

May aggravate an existing dermatitis.

Aggravated by Exposure:**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.

MATERIAL SAFETY DATA SHEET**Section 4: First Aid Measures, continued**

- 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.

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 safely. 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.

MATERIAL SAFETY DATA SHEET

Section 8: Exposure Controls and Personal Protection

Exposure Limits

<u>Ingredient</u>	<u>ACGIH TLV</u> <u>(8-hr. TWA)</u> <u>(mg/m³)</u>	<u>U.S. OSHA PEL</u> <u>(8-hr. TWA)</u> <u>(mg/m³)</u>	<u>Ontario (Canada)</u> <u>TWAEV</u> <u>(mg/m³)</u>	<u>UK OEL</u> <u>(8-hr. TWA)</u> <u>(mg/m³)</u>
Boric acid	2 (inhalable) STEL: 6 (inhalable)	Not established	2 STEV: 6	Not established
Potassium tetraborate	Not established	Not established	Not established	Not established
Fluorides, as F	2.5	2.5	2.5	2.5
Particles Not Otherwise Classified/Regulated	3 (respirable) 10 (inhalable)	5 (respirable) 15 (total dust)	3 (respirable) 10 (inhalable)	Not established

STEV = Short Term Exposure Value

STEL = Short Term Exposure Limit

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 Z94.4-93 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/m³ 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.

MATERIAL SAFETY DATA SHEET

Section 9: Physical and Chemical Properties

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

Section 10: Stability and Reactivity

<u>Stability:</u>	Stable at normal temperature
<u>Conditions to Avoid:</u>	Avoid extreme temperatures, moisture and incompatible materials.
<u>Incompatible Materials:</u>	Incompatible with strong oxidizing agents, strong acids and bases, and reactive halogens.
<u>Hazardous Decomposition Products:</u>	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.
<u>Possibility of Hazardous Reactions:</u>	Hazardous polymerization will not occur.
<u>Other Reactivity Concerns:</u>	Not available

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Section 11: Toxicological Information

Acute Toxicity Data

<u>Ingredient</u>	<u>LD₅₀ Oral</u> (mg/kg)	<u>LD₅₀ Dermal</u> (mg/kg)	<u>LC₅₀ Inhalation</u> (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:

The table below indicates whether each agency has listed any ingredient as a carcinogen.

<u>Ingredient</u>	<u>ACGIH</u>	<u>IARC</u>	<u>NTP</u>
Boric acid	A4	Not listed	Not listed
Potassium tetraborate	Not listed	Not listed	Not listed
Fluorides, as F	A4	Group 3	Not listed

ACGIH: (American Conference of Governmental Industrial Hygienists)

A4 – Not Classifiable as a Human Carcinogen.

IARC: (International Agency for Research on Cancer)

Group 3 – Not classifiable as to carcinogenicity in humans.

NTP: (National Toxicology Program)

Irritation:

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

Sensitization:

Not available

Neurological Effects:

Extreme over-exposure by ingestion or by inhalation of hydrogen fluoride may cause adverse neurological effects.

Teratogenicity:

Not available

Reproductive Toxicity:

Animal ingestion studies at high doses indicate that borates cause reproductive and developmental effects.

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.

MATERIAL SAFETY DATA SHEET**Section 12: Ecological Information**

<u>Ecotoxicity:</u>	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.
<u>Mobility:</u>	Not available
<u>Persistence and degradability:</u>	Not available
<u>Bioaccumulative potential:</u>	Not available
<u>Other adverse effects:</u>	Not available

Section 13: Disposal Considerations

<u>Waste Disposal Method:</u>	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.
<u>USA:</u>	Dispose of in accordance with local, state and federal laws and regulations. RCRA Waste Codes: None
<u>Canada:</u>	Dispose of in accordance with local, provincial and federal laws and regulations.
<u>EC:</u>	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>U.S. Hazardous Materials Regulation (DOT 49CFR):</u>	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)
<u>Canadian Transportation of Dangerous Goods (TDG):</u>	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)
<u>ADR/RID:</u>	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
<u>IMDG:</u>	HYDROGENDIFLUORIDES N.O.S., (Potassium bifluoride), 8, UN1740, PGIII, LTD QTY, EmS F-A, S-B
<u>Marine Pollutants:</u>	Not applicable
<u>ICAO/IATA :</u>	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: Acute
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. This product may not be exported without appropriate licensing.

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.

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).

MATERIAL SAFETY DATA SHEET**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.

Preparation Information:**Preparation Date:**

May 26, 2006

Revision Date:

March 5, 2008

Revision Summary:

May 26, 2006: Preparation Date
March 5, 2008: Updated Exposure Limits (Section 8) and Toxicological Information (Section 11).

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Disclaimer:

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