MATERIAL SAFETY DATA SHEET

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EMERGENCY NO. 1-800-424-9300

SECTION I. MATERIAL IDENTIFICATION

Material Name: **Lead/Tin Plating Solutions: 5:95, 10:90, 20:80, 40:60, 50:50, 60:40, 80:20, 90:10, 95:5**
Other Designations: Tin Fluoborate and Lead Fluoborate Solution
Chemical family: $Sn(BF_4)_2$, $Pb(BF_4)_2$ & HBF_4 mixture
Trade Name: Lead/Tin Plating Solutions: 5:95, 10:90, 20:80, 40:60, 50:50, 60:40, 80:20, 90:10, 95:5

SECTION II. INGREDIENTS AND HAZARDS

	CAS	%	Hazard Data Toxicity (mg/M^3)
Lead Fluoborate	13814-96-5	1-35	$50microg/M^3$ as Pb
Fluoboric Acid	16872-11-0	1-5	$2.5mg/M^3$ as F
Tin Fluoborate	13814-97-6	1-35	$2mg/M^3$ as Sn
Boric Acid	10043-35-3	1-5	$10mg/m^3$*
Gelatin	9000-70-8	< 1	N/A
Distilled Water		Balance	----

*As B_2O_3 (American Conference of Government Hygienists, 3rd Edition 1971)

SECTION III. PHYSICAL DATA

Boiling point at 1 atm, °C: N/A
Vapor pressure at 15°C, mm Hg: N/A
Vapor density (AIR=1): N/A
Water solubility at 20°C: Miscible
Specific gravity, 20/4°C: 1.75
Evap. Rate (BuAc=1): N/A
Volatiles, %: N/A
Molecular weight: Not applicable

Appearance & Odor: Clear, colorless, odorless liquid

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability	Lower	Upper
N/A	N/A	N/A	---	---

Extinguishing Media: Water spray, CO_2, foam or dry chemical
Special fire fighting procedures: When heated, irritating, toxic fumes are given off. Wear self-contained breathing apparatus.

SECTION V. REACTIVITY DATA

Stability: stable **Conditions to avoid**: Moisture. Do Not heat in presence of Al, Na, Ti, Zn, or halogens
Incompatible with: Reacts strongly with H_2O_2 and other strong oxidizers to liberate hydrogen gas. Formaldehyde.
Hazardous decomposition products: High temperatures or fire may produce lead oxide fume, vapor, or dust CO & CO_2
Hazardous polymerization: Will Not Occur **Conditions to avoid**: Moisture

SECTION VI. HEALTH HAZARD INFORMATION

Effects of overexposure: Lead intoxication will occur with accompanying symptoms of constipation, sleep disturbance, fatigue headache, loss of appetite. Caustic and corrosive effects on skin. Irritating to mucous membranes and respiratory tract.

First Aid

Eye contact: Wash with copious amounts of water for at least 15 minutes lifting eyelids occasionally. Call physician immediately.
Skin contact: Wash with soap and water for 15 minutes. Call a physician.
Inhalation: Remove to fresh air. Administer artificial respiration if victim is not breathing.
Ingestion: Induce vomiting. Call a physician immediately.

SECTION VII. SPILL, LEAK AND DISPOSAL PROCEDURES

Spills, leaks: Flush immediately. Ventilate area of spill adequately. Neutralize carefully with soda ash or lime. Wear goggles, gloves and respirator.

Disposal: Disposal of waste and hazardous material should be handled in a manner which complies with local, state, or federal Environmental Protection Agency Regulations

SECTION VIII. SPECIAL PROTECTION INFORMATION

Respiratory protection: Use a dust/fume respirator with NIOSH/MSMA approval. Respirator must be worn if TLV is exceeded.
Ventilation: Local exhaust ventilation. Ventilation as described in the Industrial Ventilation Manual, by ACGIH shall be provided where exposures exceed PEL or TLV specified in and in accord with OSHA Standard 29CFR1910.94. Currently 0.05 mg/m^3 maximum and 0.03mg/m^3 set as trigger and action levels.
Protective gloves: Rubber
Other protective equipment: Rubber boots, apron
Eye protection: Chemical worker goggles.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Storage and handling: Store in dry area where accidental contact with acids or bases is not possible. When a spill releases material into the environment, it may be necessary to file a report of discharge. Contact your local environmental authorities to determine what rules apply. Adhere to all personal protection procedures and ventilation requirements where exposure limits exceed PEL or TLV. Before using this product, be familiar with information contained in: The Federal Standard. For Occupational Exposure to Lead (29CFR1910.1025), first published in the Federal Register on 11/14/78, by OSHA, and as also later modified.

DOT Class: Corrosive Liquids, Toxic, N.O.S. (Fluoboric Acid and Metal Fluoborate), UN2922, PGII

Attachment for Lead Solutions

Effects of Overexposure

Acute overexposure: Lead intoxication will occur with accompanying symptoms of constipation, sleep disturbance, fatigue, headache, and loss of appetite. Where inhalation is severe from heavy dusting or a large quantity is ingested and left untreated, colic, anemia, vomiting and neuritis will follow as evidenced by intense periodic cramps, aching bones, and muscles, uncoordinated body movements. Worse case situations could result in convulsions, stupor, coma, and encephalopathy.

Chronic overexposure: Normal ingestion of lead from the ambient air, foods and beverages is about 0.25 to 0.35 mg per day. The normal adult metabolism can eliminate almost 1 mg of lead per day. When lead ingested exceeds the body's ability to eliminate it, accumulation can reach the point where symptoms and disability occur. In this context, lead has a cumulative toxic effect.

Early effects of chronic overexposure to lead are difficult to detect, but symptoms include persistent fatigue, sleep disturbance, headache, aching bones and muscles, constipation, abdominal pains and loss of appetite. Prolonged ingestion may be indicated by intense periodic cramps and constipation, nausea and vomiting. Excessive exposure may affects blood, nervous and digestive systems. Synthesis of hemoglobin is inhibited and will result in anemia. Apathy and depression may be symptoms. If left untreated, neuromuscular dysfunction, possible paralysis and encephalopathy can result. Unusual occurrence of symptoms should prompt immediate contact of a physician.

For industrial exposure, a worker's lead accumulation can be detected by an increase in blood lead above the base level established upon the employee's entry to the workplace. Blood lead above the biological limit value requires job removal.

Emergency and First Aid Procedures

Inhalation: Remove from exposure. Get medical attention if experiencing effects of acute overexposure.
Ingestion: Induce vomiting in a conscious individual. Get immediate medical attention. Call a physician.
Skin: Wash thoroughly with soap and water.
Eyes: Flush with copious amounts of water. Get immediate medical attention.

Notes to Physician:
Lead and its inorganic compounds are neurotoxins which may produce peripheral neuropathy. For an overview of the effects of lead exposure, consult Occupational Safety and Health Adm. App.A of occupational Exposure to Lead (29CFR1910.1025). "A Guide for Physicians, health Maintenance of Workers Exposed to inorganic Lead" is available from Lead Industries Association, Inc., 292 Madison Ave., New York, NY 10017.

ADDENDUM TO MATERIAL SAFETY DATA SHEET
REGULATORY STATUS

THIS ADDENDUM MUST NOT BE DETACHED FROM THE MSDS IDENTIFIES SARA 313 SUBSTANCE(S)

Any copying or redistribution of the MSDS must include a copy of this addendum (Chem.Key: PHACD)

HAZARD CATEGORIES FOR SARA

Section 311/312 Reporting

Acute Chronic Fire Pressure Reactive

Product or Components Of Products	SARA EHS Sect. 302		SARA Section 313 Chemicals		CERCLA Sec. 103	RCRA
	RQ (lbs.)	TPQ (lbs.)	Name List	Chemical Category	RQ (lbs.)	Section 261.33
Lead Fluoroborate (Lead Compound) (13814-96-5)	No	No	No	Yes	100	No

Applicable Products:
Tin-Lead Plating Solutions, Lead 100%

SARA Section 302 EHS RQ: Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.
SARA Section 302 EHS TPQ: Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk (*) following a threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity + 10,000 LBS.
SARA Section 313 Chemicals: Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.
CERCLA Sec 103: Comprehensive Environmental Response, Compensation and Liability Act (Superfund). Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center (800-424-8802); Listed at 40 CFR 302.4
RCRA: Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33

Effective Date 02-17-87 Supersedes 04-30-86