



MATERIAL SAFETY DATA SHEET

LPS[®] Electra-X

Revision Date: May 24, 2011

Supersedes: April 6, 2010

Section 1 • Product and Company Identification

Product Name: LPS[®] Electra-X
Part Number: 00816, C00816
Chemical Name: Halogenated hydrocarbon mixture

Product Use: An aggressive non-flammable solvent blend for the removal of dirt, moisture, dust, flux, and oxides from the internal components of electronic or precision equipment such as circuit boards and the internal components of electronic devices used in factories and other industrial settings.

Manufacturer Information: LPS Laboratories, 4647 Hugh Howell Rd., Tucker, GA, USA 30084

TEL: USA & Canada: 1 800 241-8334
Outside USA and Canada: +1 770 243-8800
FAX: USA & Canada: 1 800 543-1563
Outside USA and Canada: +1 770 243-8899

Emergency Telephone Number: Chemtrec: USA & Canada: 1 800 424-9300
Outside USA and Canada: +1 703 527-3887

Website: <http://www.lpslabs.com>

PLAIN LANGUAGE HAZARD SUMMARY

Material Safety Data Sheets can be confusing. Federal and State laws require us to include a great deal of technical information that probably will not help the non-professional. LPS includes this "PLAIN LANGUAGE HAZARD SUMMARY" to address the questions and concerns of the average worker. If you have additional health, safety or product questions, do not hesitate to call us at 800-241-8334.

Worker Toxicity

LPS Electra-X is an aggressive, non-flammable solvent blend for the removal of dirt, moisture, dust, flux, and oxides from the internal components of electronic or precision equipment, such as circuit boards, and the internal components of electronic devices used in factories and other industrial settings. LPS Electra-X contains solvents that can be irritating to the skin. The propellant will cause mild frostbite if applied directly to the skin at very close range (under 3 inches distance for several seconds). We suggest you wear gloves to avoid exposure. Don't get this product in your eyes (it stings) or breath large amounts of the vapor (it will dry out your nasal passages and if you breathe large amounts in poorly ventilated areas it can make you dizzy and even sick). Don't spray LPS Electra-X for extended periods without adequate ventilation. If you're going to perform work involving a lot of product in a poorly ventilated area, use of a respirator or self-contained breathing equipment may be required. LPS Electra-X contains 1-bromopropane, a solvent that can damage the nervous system upon prolonged exposure to high concentrations. For more exposure and first aid information, refer to MSDS Sections 2, 3, 8 and 11.

Flammability

LPS Electra-X is non-flammable under normal use. However it does contain a small amount of n-propanol, which is flammable, to inhibit surface frosting. If LPS Electra-X is applied in large amounts to energized equipment that has recesses where material can puddle, a flash fire can take place. Clean energized electrical equipment only with short bursts. Also, don't spray the product onto red-hot metal surfaces.

Disposal

LPS Electra-X is an aerosol and normally cannot be spilled. If an aerosol is dropped from several feet or crushed it may discharge its contents. Notify the proper environmental and safety personnel at your company right away. Collect any spilled material and dispose of properly. If an aerosol does not spray and has more than an inch of material inside, it will be considered hazardous waste under U.S. EPA guidelines. See section 13 for more details.



MATERIAL SAFETY DATA SHEET

LPS[®] Electra-X

Revision Date: May 24, 2011

Supersedes: April 6, 2010

Section 2 • Hazards Identification

*This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
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.*

Emergency Overview:

Aerosol: DANGER: Harmful or fatal if swallowed. Vapor Harmful. Contents under pressure. Harmful if inhaled.

Bulk: Not applicable

Primary route(s) of entry: Skin and eye contact. Inhalation.

Potential Acute Health Effects:

Eyes: Irritating to eyes.

Skin: Repeated exposure may cause skin dryness or cracking. The solvent portion of this product can also be absorbed through the skin and produce central nervous system (CNS) depression effects.

Inhalation: High vapor concentrations may cause headaches, stupor, irritation of throat and eyes, and kidney effects.

Ingestion: Not a likely route of exposure. If swallowed, call a physician immediately. ONLY induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

Potential Chronic Health Effects:

Carcinogenic Effects: NTP: No IARC: No OSHA: No ACGIH: A5 (No)

Mutagenic Effects: None

Teratogenic Effects: None

Target Organs: Continuous exposure to high concentrations of 1-bromopropane has been shown to cause serious effects to the central and peripheral nervous system in human workers (see section 11).

Medical conditions aggravated by exposure:

Persons with pre-existing central nervous system (CNS) disease, neurological conditions, skin disorders, chronic respiratory diseases, or impaired liver or kidney function should avoid exposure.

Signs and Symptoms

Stinging in eyes. Repeated or prolonged skin contact can cause redness, irritation, and scaling of the skin (dermatitis). Breathing of high vapor concentrations may cause headaches, stupor, irritation of throat and eyes, kidney effects, and loss of feeling and motor control.



MATERIAL SAFETY DATA SHEET

LPS[®] Electra-X

Revision Date: May 24, 2011

Supersedes: April 6, 2010

Section 3 • Composition / Information on Ingredients

Component	CASRN	Weight Percent
1-bromopropane	106-94-5	50 - 75%
1,1,1,2-tetrafluoroethane	811-97-2	25 - 50%
n-propanol	71-23-8	1-5%

Section 4 • First Aid Measures

- Eyes:** Check for and remove contact lenses. If irritation or redness develops, flush eyes with cool, clean, low pressure water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of the eye and eyelid tissue. Do not use eye ointment. Seek medical attention immediately.
- Skin:** Remove contaminated shoes and clothing. Clean affected area thoroughly with mild soap and water. Do not use ointments. Seek medical attention if irritation persists.
- Inhalation:** Immediately move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). If breathing is difficult, seek medical attention immediately.
- Ingestion:** Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If spontaneous vomiting is about to occur, place victim's head below knees. If victim is drowsy or unconscious, place on the left side with head down. Do not leave victim unattended. Seek medical attention immediately.

Section 5 • Fire Fighting Measures

- Products of Combustion:** Carbon monoxide, carbon dioxide, hydrogen fluoride and hydrogen bromide.
- General Fire Hazards:** High heat will cause product to boil, evolving vapor that could cause explosive rupture of closed containers.
- Firefighting media:** SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use CO₂, water spray, fog or foam. Cool containing vessels with water jet in order to prevent pressure build-up, auto ignition or explosions.
- Sensitivity to Impact:** None **Sensitivity to Static Discharge:** None
- Protection Clothing (Fire):** Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Evacuate area and fight the fire from a maximum distance or use unmanned hose holders or monitor nozzles.
- Special Remarks on Explosion Hazards:** Aerosols may explode upon heating, spread fire and overcome sprinkler systems.



MATERIAL SAFETY DATA SHEET

LPS[®] Electra-X

Revision Date: May 24, 2011

Supersedes: April 6, 2010

Section 6 • Accidental Release Measures

Containment Procedures **Small Spill and Leak:** Absorb with an inert material and dispose of properly.

Large Spill and Leak: Secure the area and control access. Dike far ahead of a liquid spill to ensure complete collection. Pick up free liquid for disposal using absorbent pads, sand, or other inert non-combustible absorbent materials. Place into appropriate waste containers for later disposal.

Clean-Up Procedures Recover free product and place in suitable container for disposal.

Evacuation Procedures Ventilate area of leak or spill. Keep unnecessary and unprotected people away.

Special Procedures Ventilate area. Wear appropriate protective equipment during cleanup.

Section 7 • Handling and Storage

Handling: Do not allow material to come in contact with eyes or skin. Wear appropriate protective equipment during handling. Keep container closed. Avoid breathing vapors or mists. Use only with adequate ventilation. Wash thoroughly after handling. Avoid spraying large quantities of material into live electrical motors and other such equipment.

Storage: Keep container in a cool, well-ventilated area. Avoid all sources of ignition (spark or flame). Store between 40°F and 120°F (4.4°C and 49°C).

Precautions to be taken in handling and storage:

Store as Level 1 Aerosol (NFPA 30B). Store all materials in a dry, well-ventilated area. Avoid breathing vapors.

Section 8 • Exposure Controls / Personal Protection

Exposure Guidelines:

Component	CASRN	OSHA TWA-PEL	OSHA STEL	ACGIH-TLV	ACGIH-STEL	NIOSH
1-bromopropane	106-94-5	100 ppm*	Not Established	10 ppm	Not Established	Not Established
1,1,1,2-Tetrafluoroethane	811-97-2	Not Established	Not Established	Not Established	Not Established	1000 ppm TWA; OEL - UK
n-propanol	71-23-8	200 ppm	Not Established	100 ppm	Not established	200 ppm TWA 250 ppm STEL

*Supplier Recommendation

Engineering Controls: Provide general and/or local exhaust ventilation to keep exposures below the exposure guidelines listed above.



MATERIAL SAFETY DATA SHEET

LPS[®] Electra-X

Revision Date: May 24, 2011

Supersedes: April 6, 2010

Personal protective equipment

Eye protection: Safety glasses with side shields conforming to appropriate regulations. Eye wash fountain and emergency shower facilities are recommended.

Hand protection: Use chemical resistant gloves conforming to appropriate regulations. Please observe the instructions regarding permeability and breakthrough time that are provided by the supplier of the gloves.

Respiratory protection: If airborne concentrations are above the applicable exposure limits (listed above), use NIOSH approved respiratory protection (i.e. organic vapor cartridge).

General Hygiene Considerations: Wash thoroughly after handling. Have eye-wash facilities immediately available.

Section 9 • Physical and Chemical Properties

Appearance:	Liquid	Color:	Clear
Odor:	Strong	Evaporation Rate:	6 (BuAc=1)
Solubility Description:	3 – 5% in water	Flash Point:	None
Boiling Point:	70°C (158 °F)	Flash Point Method:	Tag-Closed Cup
Specific Gravity (H₂O=1):	1.29 – 1.32 @ 20°C	Decomposition Temperature:	Not Established
Vapor Density (air=1):	~4.3	Auto Ignition Temperature	>490°C (914°F)
Vapor Pressure:	>100 mmHg @ 20°C	Flammable limits (estimated):	LOWER: 4.0% UPPER: 8.0%
Rule 1171 PPc:	>100 mmHg @ 20°C	Partition Coefficient (octanol/water):	<1
V.O.C. Content:	Aerosol: 70.1%, 913 g/L, 7.6 lb/gal per CARB/OTC/EPA Bulk: Not Applicable	Odor Threshold:	Not Established
Melting Point:	Not Established	Viscosity:	Not Established
pH:	Not Applicable	Volatiles:	100%
Heat of combustion:	Aerosol: 12 kJ/g Bulk: Not Applicable		



MATERIAL SAFETY DATA SHEET

LPS[®] Electra-X

Revision Date: May 24, 2011

Supersedes: April 6, 2010

Section 10 • Stability and Reactivity

Chemical Stability: Product is stable under recommended storage conditions.

Conditions to Avoid: Keep away from ignition sources and extreme temperatures.

Incompatibility: Avoid contact with aluminum equipment such as tanks, pumps, and fittings. May react violently with alkali and alkaline earth metals such as sodium, potassium and barium.

Hazardous Decomposition: These products are carbon oxides (CO, CO₂), hydrogen bromide and hydrogen fluoride.

Hazardous Polymerization: Will not occur.

Section 11 • Toxicological Information

Acute and Chronic Toxicity

A: General Product Information

Following exposure to vapors, this material can produce central nervous system depression. High atmospheric concentrations can result in eye, nasal and respiratory tract irritation. However, if handled in accordance with good industrial hygiene practice, this product will not present a significant hazard in the workplace.

B: Component Analysis

Component	CASRN	LC-50	LD-50
1,1,1,2-tetrafluoroethane	811-97-2	1500 g/m ³ / rat / 4 hr*	Not appropriate
1-bromopropane	106-94-5	253 g/m ³ / rat / 30 minutes	4260 mg/kg / oral / rat
n-propanol	71-23-8	48 g/m ³ / mouse	1870 mg/kg / oral / rat 4060 mg/kg / dermal / rabbit

Notes for 1-bromopropane RTECS Number: TX4110000

Type of Test	Route of Exposure	Species Observed	Dose Data	Sex/Duration	Toxic Effects
TCLo Lowest published toxic concentration	Inhalation	Rat	821 ppm/8hr	Male/12 weeks pre-mating	Reproductive – paternal effects - spermatogenesis
Reference	SAIBGL Sangyo Igaku. Japanese Journal of Industrial Health. (Nippon Sangyo Eisei Igakkai, Kosu Eisei Bldg., 1-29-8, Shinjuku, Shinjuku-ku, Tokyo 160, Japan v.1-1959)				
TDLo – Lowest published toxic dose	Inhalation	Rat	400 ppm	8hr/12weeks (intermittent)	Peripheral Nerve and Sensation – structural change in nerve or sheath

Reference TOXID9 Toxicologist. (Soc. Of Toxicology, Inc. 475 Wolf Ledge Parkway, Akron, OH 44311) V.1 - 1981



MATERIAL SAFETY DATA SHEET

LPS[®] Electra-X

Revision Date: May 24, 2011

Supersedes: April 6, 2010

Notes for n-propanol
 RTECS Number: UH8225000

Type of Test	Route of Exposure	Species Observed	Dose Data	Sex/Duration	Toxic Effects
TDLo – Lowest published toxic dose	Oral	Rat	50000 mg/kg	81 Weeks (intermittent)	Tumorigenic – carcinogenic by RTECS criteria – Liver tumors – Blood - leukemia

Reference ARGEAR Archiv fuer Geschwulstforschung. (VEB Verlag Volk und Gesundheit Neue Gruenster. 18, Berlin DDR-1020, Ger. Dem. Rep.) V.1 – 1949

TCLo – Lowest published toxic concentration	Inhalation	Rat	10000 ppm	Female/7hr/1-19 days after conception	Embryo or Fetus – death, Developmental Abnormalities – musculoskeletal system
---	------------	-----	-----------	---------------------------------------	---

Reference FCTOD7 Food and Chemical Toxicology. (Pergamon Press Inc. Maxwell House, Fairview Park, Elmsford, NY 10523) V.20-1982

Section 12 • Ecological Information

Mobility:	Semi-volatile. Readily absorbed into soil.	Persistence and degradability:	Slightly biodegradable
Bioaccumulative potential:	No bioaccumulation potential	Other adverse effects:	None known

Ecological studies have not been conducted for this product. The following information is available for component(s) of this product.

Ecotoxicity:

Effect on Organisms	Component	CASRN	Test	Species	Results
Acute Toxicity on Fishes	1-bromopropane	106-94-5	96-hour LC ₅₀	Pimephales promelas	67.3 mg/L
	n-propanol	71-23-8	96-hour LC ₅₀	Pimephales promelas	4480 mg/L
Acute Toxicity on Daphnia	No Data Available				
Bacterial inhibition					
Growth inhibition of algae					
Bioaccumulation in fish					

*Supplier Data



MATERIAL SAFETY DATA SHEET

LPS® Electra-X

Revision Date: May 24, 2011

Supersedes: April 6, 2010

Section 13 • Disposal Considerations

Waste Status: Aerosol cans, if depressurized and emptied to less than 1 inch (2.54 cm) of fluid contents, are classified as non-hazardous waste under 40 CFR 261.7 (U.S.). If disposed of in its received form, the aerosol product carries waste code D003 (U.S.).

Disposal: Waste must be disposed of in accordance with federal, state, provincial, and local environmental control regulations. Do not dump into sewers, on ground, or into a body of water. The preferred disposal options include sending the material to a licensed, permitted recycler, reclaimer, or incinerator.

Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information inaccurate, incomplete, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive than federal laws and regulations.

Section 14 • Transport Information

D.O.T. Ground	Shipping Name:	Consumer Commodity	UN no:	NA
	Hazard Class:	ORM-D	Technical Name:	NA
	Subclass:	NA	Hazard Label:	ORM-D Already on box
	Packing group:	NA		
Road/Rail - ADR/RID	UN no:	1950	ADR Class:	2
	Packing group:	NA	Classification code:	5A
	Name and Description:	Aerosols, asphyxiant	Hazard ID no:	NA
	Labeling:	2.2	Technical Name:	NA
IMDG-IMO	UN no:	1950	Class:	2
	Shipping Name:	Aerosols	Subsidiary Risk:	2.2
	Labeling:	2	Packing group:	NA
	Packing Instruction:	P003, LP02	EmS:	F-D, S-U
	Marine pollutant:	No	Technical Name:	NA
IATA-ICAO	UN no:	1950	Class:	2.2
	Shipping Name:	Aerosols, non-flammable	Subclass:	NA
	Packing instructions:	203, Y203 (Ltd. Qty)	Packing group:	NA
	Labeling:	Non-flammable Gas	Technical Name:	NA

The preceding information is subject to change and must be verified prior to shipment. It is the responsibility of anyone offering hazardous materials for shipment to ensure compliance with all applicable regulations.



MATERIAL SAFETY DATA SHEET

LPS[®] Electra-X

Revision Date: May 24, 2011

Supersedes: April 6, 2010

Section 15 • Regulatory information

U.S. Federal Regulations

RCRA Hazardous Waste No.: D003

Comprehensive Environmental Response and Liability Act of 1980 (CERCLA): none

Toxic Substances Control Act (TSCA): All components of this product are TSCA inventory listed and/or are exempt.

Superfund Amendments and Reauthorization Act (SARA) Title III SARA Section 311/312 (40 CFR 370) Hazard Categories: Sudden Release of Pressure, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

This product contains the following toxic chemical(s) subject to reporting requirements of SARA Section 313 (40 CFR 372): No individual section 313 component is present at or above 1%.

Section 112 Hazardous Air Pollutants (HAPs): None

State Regulations

California: This product contains chemical(s) known to the State of California to cause birth defects or other reproductive harm.

California and OTC States: This product conforms to consumer product regulations.

New Jersey Right to Know:

Aerosol: 1,1,1,2-tetrafluoroethane 811-97-2 • 1-bromopropane 106-94-5 • n-propanol 71-23-8 • 1, 2-butylene oxide 106-88-7 • Tert-butanol 75-65-0

Bulk: Not applicable

International Regulations

Canadian Environmental Protection Act: All of the components of this product are included on the Canadian Domestic Substances list (DSL).

Canadian Workplace Hazardous Materials Information System WHMIS:

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:

Aerosol: Class A, Class D2B



Other Regulations

Montreal Protocol listed ingredients:	None
Stockholm Convention listed ingredients:	None
Rotterdam Convention listed ingredients:	None
RoHS Compliant:	Yes



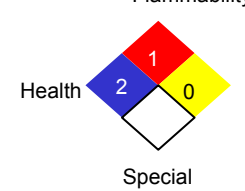
MATERIAL SAFETY DATA SHEET

LPS® Electra-X

Revision Date: May 24, 2011

Supersedes: April 6, 2010

Section 16 • Other Information

MSDS#10816 MSDS Preparation Responsible Name: Elena Badiuzzi Compliance Manager Telephone: +1 770 243-8800	HMIS 1996		HMIS III		NFPA Flammability  Health Reactivity Special
	Health:	2	Health:	*2	
	Flammability:	1	Flammability Aerosol:	2	
			Flammability Bulk:	N/A	
	Reactivity:	0	Physical Hazard Aerosol:	2	
			Physical Hazard Bulk:	N/A	

Notice to Reader:

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Elena Badiuzzi, Compliance Manager
 LPS Laboratories, a division of Illinois Tool Works