



MATERIAL SAFETY DATA SHEET

LPS Electra-X Contact Cleaner

Revision 6

Revision Date 9/30/2009

Supersedes: 8/19/2009

Section 1 • Product and Company Identification

Product Name: LPS Electra-X Electro Contact Cleaner
Part Number: 00816, C00816
Chemical Name: Halogenated hydrocarbons

Product Use: LPS Electra X Contact Cleaner 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.

Manufacturer Information: LPS Laboratories, 4647 Hugh Howell Rd., Tucker, GA, USA 30084
TEL: 1 770-243-8800

Emergency Telephone Number: 1-800-424-9300 Chemtrec;
Outside U.S.: (703) 527-3887

FAX: 1 770-243-8899
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 an ozone-friendly propellant, but one that will cause mild frostbite to skin if applied directly, in large amounts and at very close range (under 3 inches distance and for several seconds). It also contains 1-bromopropane, a non-flammable solvent that has been used safely for years, but one that you shouldn't be exposed to in large amounts for long periods.

If you use the product in short bursts to remove small amounts of residue, no skin protection should be necessary. If you intend to use the product continuously to soak down a large area for cleaning, we suggest you wear gloves to avoid extended exposure of skin. Don't get it 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. 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 few percent of n-propanol to inhibit surface frosting. If LPS Electra-X is applied in large amounts on electric motors or other energized equipment having 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. If less than one inch of product remains in the can and it has no positive pressure, it is considered "empty" by EPA Standards. The chemical blend itself is not considered a hazardous waste by U.S. E.P.A. If a can is not empty and will not spray, contact LPS for instructions. See section 13 for more details.



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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: DANGER: Harmful or fatal if swallowed. Vapor Harmful. Contents under pressure. Clear, colorless liquid with strong ethereal odor.

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 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:

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

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

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, and kidney effects. Loss of feeling and motor control.

Section 3 • Composition / Information on Ingredients

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

Note: due to the phase-out of HCFC-141b, the composition of LPS Electra-X was changed with lot number 6212:



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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

Flash point: TCC CLOSED CUP: None.

Flammable limits: LOWER: 4.0% UPPER: 8.0% **Autoignition Temperature:** >490°C (914°F)

Products of Combustion: Carbon monoxide, carbon dioxide, hydrogen fluoride, hydrogen bromide.

Firefighting media: SMALL FIRE: Use DRY chemical powder.

LARGE FIRE: Use 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: While this material is not considered flammable, high heat will cause product to boil and cause explosive rupture of closed containers.

Section 6 • Accidental Release Measures

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

Large Spill and Leak: For large spills, secure the area and control access. Dike far ahead of a liquid spill to ensure complete collection. Water mist or spray may be used to reduce or disperse vapors; however, it may not prevent ignition in closed spaces. Collect any excess material with absorbent pads, sand, or other inert non-combustible absorbent materials. Place into appropriate waste containers for later disposal. See section 13 for additional disposal information.



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Section 7 • Handling and Storage

Handling: Avoid contact with eyes, skin and clothing. After handling, always wash hands thoroughly with soap and water. Use only with adequate ventilation. Avoid breathing vapors or spray mists. Avoid spraying large quantities of material into live electrical motors and other such equipment.

Storage: Keep container in a cool, well-ventilated area. Store below 120°F.

Precautions to be taken in handling and storage: Store as Level 1 Aerosol (NFPA 30B). Store all materials in dry, well-ventilated area. Avoid breathing vapors.

Section 8 • Exposure Controls / Personal Protection

Component	CASRN	OSHA TWA-PEL	OSHA STEL	ACGIH-TLV	ACGIH-STEEL	NIOSH
1-bromopropane	106-94-5	10 ppm	Not Established	Not Established	Not Established	Not Established
n-propanol	71-23-8	200 ppm	Not Established	100 ppm	Not established	200 ppm TWA 250 ppm STEL
Carbon dioxide	124-38-9	5000 ppm	Not Established	5000 ppm	30000ppm	5000 ppm TWA 30000 ppm TWA

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits.

Personal Protection:

Eyes: Safety glasses/goggles.

Respiratory: Use organic vapor respirator if ventilation is inadequate.

Hands: **Hands:** Use PVA or Laminate Film* gloves. (*Ansell Gloves)

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



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Section 9 • Physical and Chemical Properties

Appearance:	Clear liquid.	Color:	Clear
Odor/Taste:	Characteristic (Strong)	Evaporation rate:	6 (n-butyl acetate = 1)
Odor Threshold:	Not available	Flash Point:	None
Boiling Point:	70.2°C (158 °F)	Flash Point Method:	TCC
Specific gravity:	1.307 (Water=1)	Auto Ignition Temperature:	>490°C (914°F)
Vapor Pressure:	~112 mmHg (at 20°C)	Decomposition Temperature:	Not available
Vapor density:	~4.3 (Air=1)	Coefficient of Oil/Water Distribution:	< 1
VOC Content:	70.1%, 913 g/L, 7.6 #/gal. Per CARB / OTC Regulations	Solubility in water:	3-5%
Flammability Limits (estimated):	Lower: 4.0% Upper: 8.0%	Viscosity:	Not available
pH:	Not Available	Volatility:	100% (v/v)

Section 10 • Stability and Reactivity

Stability and Reactivity: The product is stable.

Hazardous polymerization: Will not occur.

Incompatibility with Various Substances: Avoid long-term storage in aluminum vessels such as tanks, piping and transfer pumps. May react violently with alkali and alkaline earth metals such as sodium, potassium and barium.

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

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.



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B: Component Analysis

Ingredients	CASRN	LC-50	LD-50	CARCINOGENICITY	EPIDEMIOLOGY	REPRODUCTIVE DATA	NEUROTOXICITY	MUTAGENICITY
1,1,1,2-tetrafluoroethane	811-97-2	1500 gm/m ³ /4H/rat	Not available	No data	No data	No data	No data	No data
1-bromopropane	106-94-5	253 gm/m ³ /30 min. rat	2530 mg/kg mouse	No data	No data	Note 1	Note 2	No data
n-propanol	71-23-8	49000 mg/m ³ /mouse	1900 mg/kg rat	ACGIH "A3" - no other listings including California	Note 3	Note 4	No Data	No data

Notes for 1-bromopropane:

Note	Type of Test	Route of Exposure	Species Observed	Dose Data	Sex/Duration	Toxic Effects
1*	TCLo Lowest published toxic concentration	Inhalation	Rat	821 ppm / 8H	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)						
2*	TDLo – Lowest published toxic dose	Inhalation	Rat	400 ppm	8H/12W (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						

*RTECS Number TX4110000

Notes for n-propanol

Note	Type of Test	Route of Exposure	Species Observed	Dose Data	Sex/Duration	Toxic Effects
3**	TDLo – Lowest published toxic dose	Oral	Rat	50000 mg/kg	81 W (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						
4**	TCLo – Lowest published toxic concentration	Inhalation	Rat	10000 ppm	Female/7H/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						

** RTECS Number: UH8225000



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Section 12 • Ecological Information

General Product Information

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

Ecotoxicity:

Ingredients	CAS RN	Test	Species	Results
1-bromopropane	106-94-5	96-hour LC ₅₀	Pimephales promelas (fathead minnow)	67.3 mg/L
n-propanol	71-23-8	96-hour LC ₅₀	Pimephales promelas (fathead minnow)	4480 mg/L

Persistence / Degradability: Only slightly biodegradable

Bioaccumulation / Accumulation: No bioaccumulation potential

Mobility in Environment: Semi-volatile. Readily absorbed into soil.

Other adverse effects: None known.

Section 13 • Disposal Considerations

Waste Status: For all "non-empty" aerosols (pressurized and containing at least 2.54 cm of liquid), the RCRA hazardous waste number is D003.

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.



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Section 14 • Transport Information

D.O.T. Ground	Shipping Name:	Consumer Commodity	UN Number:	NA
	Hazard Class:	ORM-D	Technical Name:	NA
	Subclass:	NA	Hazard Label:	ORM-D
Road/Rail - ADR/RID :	UN no:	1950	ADR Class:	2
	Packing group:	N/A	Classification code:	5TF
	Name and Description:	AEROSOLS, toxic, flammable	Hazard ID no:	N/A
	Labeling:	6.1, 2.1		
IMDG-IMO	UN no:	1950	Class:	2
	Shipping Name:	AEROSOLS	Subsidiary Risk:	NA
	Labeling:	NA	Packing group:	N/A
	Marine pollutant:	NO	EmS:	F-D, S-U
IATA-ICAO:	UN no:	1950	Class:	2.2
	Shipping Name:	Aerosols, non-flammable	Subclass	NA
	Packing group:	NA	Packing instructions:	NA
	Labeling:	Non-flammable Gas		

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

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



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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 regulations.

New Jersey Right to Know: 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 • Tertiary butyl alcohol 75-65-0

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.

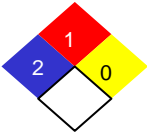
WHMIS Classification: Class A, Class D2B



Other Regulations

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

Section 16 • Other Information

MSDS#10816 Responsible Name: Clea Johnson Regulatory Affairs Coordinator	HMIS 1996		HMIS III	NFPA Flammability  Health Reactivity	
	Health:	2	Health:		2*
	Flammability:	1	Flammability:		1
	Reactivity:	0	Physical Hazard:		2

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.

Clea L Johnson, Regulatory Affairs Coordinator
LPS Laboratories
A division of Illinois Tool Works