MATERIAL SAFETY DATA SHEET
LPS® No Flash / No Flash Nu

Revision Date: **August 24, 2011** **Supersedes:** **February 4, 2011**

Section 1 • Product and Company Identification

Product Name: LPS® No Flash / No Flash Nu

Part Number(s): 04016 / C04015

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 Road, Tucker, GA, USA 30084
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Emergency Telephone Number: Chemtrec: USA & Canada: 1 800 424-9300
Outside USA and Canada: +1 703 527-3887

Website: http://www.lpslabs.com

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

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.

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 a suitable container for disposal.

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

Special Procedures: Ventilate area. Wear personal 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. Store between 40°F and 120°F (4.4°C and 49°C).

Precautions to be taken in handling and storage:
Store aerosols 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	ACGIH	NIOSH	Supplier
1-Bromopropane	106-94-5	Not established	10 ppm TLV	Not established	100 ppm TWA
1,1,1,2-Tetrafluoroethane	811-97-2	Not established	Not established	Not established	1000 ppm TWA WEEL
n-Propanol	71-23-8	200 ppm PEL	100 ppm TLV	200 ppm TWA 250 ppm STEL	None reported

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

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 chemically resistant protective 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 (914ºF)
Vapor Pressure:	> 100 mm Hg @ 20ºC	**Flammable limits (estimated):**	LOWER: 4.0% UPPER: 8.0%
Rule 1171 PPc:	> 100 mm Hg @ 20ºC	**Partition Coefficient (octanol/water):**	< 1
V.O.C. Content:	Aerosol: 70.1% per State & Federal Consumer Product Regulations; 913 g/L per SCAQMD Rule 102 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		

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-Bromopropane	106-94-5	253 g/m3 / rat / 30 minutes	4260 mg/kg / oral / rat
1,1,1,2-Tetrafluoroethane	811-97-2	1500 g/m3 / rat / 4 hr*	Not appropriate
n-Propanol	71-23-8	48 g/m3 / mouse	1870 mg/kg / oral / rat 4060 mg/kg / dermal / rabbit

* Supplier Data

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 / 8 hr.	Male / 12 weeks pre-mating	Reproductive - Paternal effects - Spermatogenesis

Reference: SAIBGL Sangyo Igaku, Japanese Journal of Industrial Health (Nippon Sangyo Eisei Igakkai, Kosus Eisei Bldg., 1-29-8, Shinjuku, Shinjuku-Ku, Tokyo 160, Japan v.1-1959)

TCLo Lowest published toxic concentration	Inhalation	Rat	400 ppm	8 hr. / 12 Weeks (intermittent)	Peripheral nerve and sensation - structural change in nerve or sheath

Reference: TOXID9 Toxicologist (Society of Toxicology, Inc., 475 Wolf Ledge Parkway, Akron, Ohio, USA 44311)

Notes for n-Propanol
RTECS Number: UH8225000

Type of test	Route of exposure	Species observed	Dose Data	Sex / Duration	Toxic Effects
TCLo Lowest published toxic concentration	Oral	Rat	5000 mg/kg	81 Weeks (Intermittent)	Tumorigenic - Carcinogenic by RTECS criteria - Liver tumors - Blood - Leukemia

Reference: ARGEAR Archiv fuer Geschwulstforschung (VEB Verlag Volk und Gesunchheit Neue Gruenster 18, Berlin DDR-1020, German Democratic Republic) V.1 - 1499

TCLo Lowest published toxic concentration	Inhalation	Rat	10000 ppm	Female / 7 hr. / 1 - 19 days after conception	Embryo or Fetus - death, developmental abnormalities - muculoskeletal system

Reference: FCTOD7 Food and Chemical Toxicology (Permagon Press Inc., Maxwell House, Fairway Park, Elmsford, NY USA 10523) V.2.0-1982

Section 12 • Ecological Information

Mobility: Semi-volatile. Readily absorbed into soil. **Persistence / 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

Effects on Organisms	Component	CASRN	Test	Species	Results
Acute Toxicity on Fishes	1-Bromopropane	106-94-5	96-hr LC50	Pimephales Promelas	67.3 mg/L
	n-Propanol	71-23-8	96-hr LC50	Pimephales Promelas	4480 mg/L
Acute Toxicity on Daphnia	No data available				
Bacterial Inhibition					
Growth inhibition of algae					
Bioaccumulation in fish					

* Supplier Data

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 the waste code D003 (U.S.).

Disposal: Waste must be disposed of in accordance with any and all applicable environmental control rules and/or regulations.

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:**	2.2
	Shipping Name:	Aerosols	**Subsidiary Risk:**	NA
	Labeling:	2	**Packing Group:**	NA
	Packing Instructions:	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.

Section 15 • Regulatory Information

U.S. Federal Regulations

RCRA Hazardous Waste No.: D003

Comprehensive Environmental Response, Compensation 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, Fire Hazard, 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 cancer, birth defects or other reproductive harm.

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

New Jersey Right to Know:
Aerosol: 1-Bromopropane 106-94-5 ● 1,1,1,2-Tetrafluoroethane 811-97-2 ● 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 (CEPA):
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 engredients:	None
RoHS Compliant:	Yes

Section 16 • Other Information

MSDS#: 14016
MSDS Preparation Responsible Name:
Elena Badiuzzi
Compliance Manager
Telephone: +1 770 243-8800

HMIS 1996		HMIS III	
Health:	2	Health:	[*] 2
Flammability:	1	Flammability Aerosol:	2
		Flammability Bulk:	NA
Reactivity:	0	Physical Hazard Aerosol:	2
		Physical Hazard Bulk:	NA

NFPA
Flammability
Health 1 2 0 Reactivity
Special

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