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
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

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

<table>
<thead>
<tr>
<th>Component</th>
<th>CASRN</th>
<th>Weight Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Bromopropane</td>
<td>106-94-5</td>
<td>50 - 75%</td>
</tr>
<tr>
<td>1,1,1,2-Tetrafluoroethane</td>
<td>811-97-2</td>
<td>25 - 50%</td>
</tr>
<tr>
<td>n-Propanol</td>
<td>71-23-8</td>
<td>1 - 5%</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Component</th>
<th>CASRN</th>
<th>OSHA</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Bromopropane</td>
<td>106-94-5</td>
<td>Not established</td>
<td>10 ppm TLV</td>
<td>Not established</td>
<td>100 ppm TWA</td>
</tr>
<tr>
<td>1,1,1,2-Tetrafluoroethane</td>
<td>811-97-2</td>
<td>Not established</td>
<td>Not established</td>
<td>Not established</td>
<td>1000 ppm TWA WEEL</td>
</tr>
<tr>
<td>n-Propanol</td>
<td>71-23-8</td>
<td>200 ppm PEL</td>
<td>100 ppm TLV</td>
<td>200 ppm TWA 250 ppm STEL</td>
<td>None reported</td>
</tr>
</tbody>
</table>

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 (914°F)
Vapor Pressure: > 100 mm Hg @ 20°C  Flammable limits (estimated): LOWER: 4.0%  UPPER: 8.0%
Rule 1171 PPc: > 100 mm Hg @ 20°C  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

<table>
<thead>
<tr>
<th>Component</th>
<th>CASRN</th>
<th>LC-50</th>
<th>LD-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Bromopropane</td>
<td>106-94-5</td>
<td>253 g/m3 / rat / 30 minutes</td>
<td>4260 mg/kg / oral / rat</td>
</tr>
<tr>
<td>1,1,1,2-Tetrafluoroethane</td>
<td>811-97-2</td>
<td>1500 g/m3 / rat / 4 hr*</td>
<td>Not appropriate</td>
</tr>
<tr>
<td>n-Propanol</td>
<td>71-23-8</td>
<td>48 g/m3 / mouse</td>
<td>1870 mg/kg / oral / rat</td>
</tr>
</tbody>
</table>

* Supplier Data

Notes for 1-Bromopropane
RTECS Number: TX4110000

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Route of exposure</th>
<th>Species observed</th>
<th>Dose Data</th>
<th>Sex / Duration</th>
<th>Toxic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCLo Lowest published toxic concentration</td>
<td>Inhalation</td>
<td>Rat</td>
<td>821 ppm / 8 hr.</td>
<td>Male / 12 weeks pre-mating</td>
<td>Reproductive - Paternal effects - Spermatogenesis</td>
</tr>
</tbody>
</table>


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

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

Reference: ARGEAR Archiv fuer Geschwulstforschung (VEB Verlag Volk und Gesundheit 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

<table>
<thead>
<tr>
<th>Effects on Organisms</th>
<th>Component</th>
<th>CASRN</th>
<th>Test</th>
<th>Species</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity on Fishes</td>
<td>1-Bromopropane</td>
<td>106-94-5</td>
<td>96-hr LC50</td>
<td>Pimephales Promelas</td>
<td>67.3 mg/L</td>
</tr>
<tr>
<td></td>
<td>n-Propanol</td>
<td>71-23-8</td>
<td>96-hr LC50</td>
<td>Pimephales Promelas</td>
<td>4480 mg/L</td>
</tr>
</tbody>
</table>

Acute Toxicity on Daphnia: No data available

Bacterial Inhibition: No data available

Growth inhibition of algae: No data available

Bioaccumulation in fish: No data available

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

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

Section 14 • Transport Information

<table>
<thead>
<tr>
<th>D.O.T. Ground</th>
<th>Shipping Name: Consumer Commodity</th>
<th>UN No.: NA</th>
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</thead>
<tbody>
<tr>
<td>Hazard Class: ORM-D</td>
<td>Technical Name: NA</td>
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</tr>
<tr>
<td>Subclass: NA</td>
<td>Hazard Label: ORM-D Already on box</td>
<td></td>
</tr>
<tr>
<td>Packing Group: NA</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Road/Rail - ADR/RID</th>
<th>UN No.: 1950</th>
<th>ADR Class: 2</th>
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<tbody>
<tr>
<td>Packing Group: NA</td>
<td>Classification Code: 5A</td>
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<tr>
<td>Name and description: AEROSOLS, asphyxiant</td>
<td>Hazard ID No.: NA</td>
<td></td>
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<tr>
<td>Labeling: 2.2</td>
<td>Technical Name: NA</td>
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<table>
<thead>
<tr>
<th>IMDG-IMO</th>
<th>UN No.: 1950</th>
<th>Class: 2.2</th>
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<tbody>
<tr>
<td>Shipping Name: Aerosols</td>
<td>Subsidary Risk: NA</td>
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</tr>
<tr>
<td>Labeling: 2</td>
<td>Packing Group: NA</td>
<td></td>
</tr>
<tr>
<td>Packing Instructions: P003, LP02</td>
<td>EmS: F-D, S-U</td>
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<tr>
<td>Marine pollutant: No</td>
<td>Technical Name: NA</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IATA - ICAO</th>
<th>UN No.: 1950</th>
<th>Class: 2.2</th>
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</thead>
<tbody>
<tr>
<td>Shipping Name: Aerosols, non-flammable</td>
<td>Subclass: NA</td>
<td></td>
</tr>
<tr>
<td>Packing Instructions: 203, Y203 (Ltd. Qty.)</td>
<td>Packing Group: NA</td>
<td></td>
</tr>
<tr>
<td>Labeling: Non-flammable Gas</td>
<td>Technical Name: NA</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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 ingredients: None
RoHS Compliant: Yes

Section 16 • Other Information

<table>
<thead>
<tr>
<th>MSDS#: 14016</th>
<th>HMIS 1996</th>
<th>HMIS III</th>
<th>NFPA Flammability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health: 2</td>
<td>Health: [*] 2</td>
<td>Health: 2</td>
</tr>
<tr>
<td></td>
<td>Flammability: 1</td>
<td>Flammability Aerosol: 2</td>
<td>Flammability Bulk: NA</td>
</tr>
<tr>
<td></td>
<td>Reactivity: 0</td>
<td>Physical Hazard Aerosol: 2</td>
<td>Physical Hazard Bulk: NA</td>
</tr>
</tbody>
</table>

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