



# MATERIAL SAFETY DATA SHEET

## 1. Product and Company Identification

Product identifier	LPS® NoFlash NU	
Version #	01	
Issue date	05-22-2014	
CAS #	Mixture	
Part Number	C04015	
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, a division of Illinois Tool Works 4647 Hugh Howell Rd Tucker, Georgia 30084 United States www.lpslabs.com 1-800-241-8334/ 770-243-8800 Chemtrec 1-800-424-9300	
Supplier	Not available.	

## 2. Hazards Identification

Emergency overview	DANGER  Aerosol. Contents under pressure. Pressurized container may explode when exposed to heat or flame.  Harmful if swallowed. Suspected of causing cancer. May damage fertility or the unborn child. Irritating to eyes, respiratory system and skin. Vapors may cause drowsiness and dizziness. May cause damage to organs through prolonged or repeated exposure.
Potential health effects	
Routes of exposure	Eye contact. Skin contact. Inhalation. Ingestion.
Eyes	Avoid contact with eyes. Causes eye irritation.
Skin	Avoid contact with the skin. Causes skin irritation. May be harmful if absorbed through skin.
Inhalation	Avoid breathing dust/fume/gas/mist/vapors/spray. Irritating to respiratory system. Prolonged inhalation may be harmful.
Ingestion	Harmful if swallowed. Do not ingest.
Target organs	Eyes. Skin. Central nervous system. Respiratory system. Liver.
Chronic effects	May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue, mental confusion and blurred vision) and/or damage. Pregnant women or women of child-bearing age should not be exposed to this product. Can cause adverse reproductive effects - such as birth defects, miscarriages, or infertility. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. Kidney injury may occur. Liver injury may occur.
Signs and symptoms	Irritating to eyes, respiratory system and skin. Symptoms may include redness, edema, drying, defatting and cracking of the skin. Exposed individuals may experience eye tearing, redness, and discomfort. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Behavioral changes. Decrease in motor functions. Narcosis. Sterility. Birth defects.
Potential environmental effects	Harmful to aquatic organisms. May cause long-term adverse effects in the environment.

## 3. Composition / Information on Ingredients

Hazardous components	CAS #	Percent
n-Propyl Bromide	106-94-5	60 - 70
ETHANE, 1,1,1,2-TETRAFLUORO-(HFC-134a)	811-97-2	30 - 40
PROPYL ALCOHOL	71-23-8	1 - 5

Hazardous components	CAS #	Percent
1,2 Butylene Oxide	106-88-7	< 1
Non-hazardous components	CAS #	Percent
TERT-BUTANOL	75-65-0	< 1

## 4. First Aid Measures

### First aid procedures

<b>Eye contact</b>	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
<b>Skin contact</b>	Wash off with soap and water. Get medical attention if irritation develops and persists.
<b>Inhalation</b>	Remove victim to fresh air and keep at rest in a position comfortable for breathing. For breathing difficulties, oxygen may be necessary. Call a physician if symptoms develop or persist.
<b>Ingestion</b>	Call a physician or poison control center immediately. Only induce vomiting at the instruction of medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

### Notes to physician

Provide general supportive measures and treat symptomatically.

### General advice

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Call a POISON CENTER or doctor/physician if you feel unwell.

## 5. Fire Fighting Measures

### Flammable properties

Not flammable by WHMIS criteria.

### Extinguishing media

**Suitable extinguishing media** Powder. Alcohol resistant foam. Water spray. Carbon dioxide (CO<sub>2</sub>).

**Unsuitable extinguishing media** Do not use water jet as an extinguisher, as this will spread the fire.

### Protection of firefighters

**Protective equipment for firefighters** Firefighters should wear full protective clothing including self contained breathing apparatus.

### Fire fighting equipment/instructions

Containers should be cooled with water to prevent vapor pressure build up.

### Explosion data

**Sensitivity to static discharge** None known.

**Sensitivity to mechanical impact** None known.

### Hazardous combustion products

May include oxides of carbon. Hydrogen bromide

## 6. Accidental Release Measures

### Personal precautions

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. For personal protection, see section 8 of the MSDS.

### Environmental precautions

Do not contaminate water.

### Methods for containment

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop leak if you can do so without risk. Move the cylinder to a safe and open area if the leak is irreparable. Use water spray to reduce vapors or divert vapor cloud drift. Prevent entry into waterways, sewer, basements or confined areas.

### Methods for cleaning up

Should not be released into the environment. Stop the flow of material, if this is without risk. Isolate area until gas has dispersed. Following product recovery, flush area with water. Clean up in accordance with all applicable regulations. For waste disposal, see section 13 of the MSDS.

### Other information

Clean up in accordance with all applicable regulations.

## 7. Handling and Storage

### Handling

Pressurized container: Do not pierce or burn, even after use. Do not use if spray button is missing or defective. Do not spray on a naked flame or any other incandescent material. Do not smoke while using or until sprayed surface is thoroughly dry. Do not cut, weld, solder, drill, grind, or expose containers to heat, flame, sparks, or other sources of ignition. Ground and bond containers when transferring material. Do not re-use empty containers. Do not breathe dust. Avoid contact with skin. Avoid contact with eyes. Avoid prolonged exposure. When using do not eat or drink. Do not use in areas without adequate ventilation. Wear personal protective equipment. Wash thoroughly after handling. Avoid release to the environment.

### Storage

Contents under pressure. Do not expose to heat or store at temperatures above 120 °F/49 °C as can may burst. Do not puncture, incinerate or crush. Do not handle or store near an open flame, heat or other sources of ignition. Store in a closed container away from incompatible materials. Store away from incompatible materials (see Section 10 of the MSDS). Keep out of the reach of children. Use care in handling/storage.

## 8. Exposure Controls / Personal Protection

### Occupational exposure limits

#### US. ACGIH Threshold Limit Values

Components	Type	Value
n-Propyl Bromide (CAS 106-94-5)	TWA	10 ppm
PROPYL ALCOHOL (CAS 71-23-8)	TWA	100 ppm
TERT-BUTANOL (CAS 75-65-0)	TWA	100 ppm

#### Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
PROPYL ALCOHOL (CAS 71-23-8)	STEL	984 mg/m3
	TWA	400 ppm 492 mg/m3 200 ppm
TERT-BUTANOL (CAS 75-65-0)	TWA	303 mg/m3 100 ppm

#### Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value
n-Propyl Bromide (CAS 106-94-5)	TWA	10 ppm
PROPYL ALCOHOL (CAS 71-23-8)	TWA	100 ppm
TERT-BUTANOL (CAS 75-65-0)	TWA	100 ppm

#### Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Components	Type	Value
n-Propyl Bromide (CAS 106-94-5)	TWA	10 ppm
PROPYL ALCOHOL (CAS 71-23-8)	TWA	100 ppm
TERT-BUTANOL (CAS 75-65-0)	TWA	100 ppm

#### Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value
n-Propyl Bromide (CAS 106-94-5)	TWA	10 ppm
PROPYL ALCOHOL (CAS 71-23-8)	TWA	100 ppm
TERT-BUTANOL (CAS 75-65-0)	STEL	150 ppm

**Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)**

Components	Type	Value
	TWA	100 ppm

**Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)**

Components	Type	Value
PROPYL ALCOHOL (CAS 71-23-8)	STEL	614 mg/m3
		250 ppm
	TWA	492 mg/m3
		200 ppm
TERT-BUTANOL (CAS 75-65-0)	TWA	303 mg/m3
		100 ppm

**US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

Components	Type	Value
PROPYL ALCOHOL (CAS 71-23-8)	PEL	500 mg/m3
		200 ppm
TERT-BUTANOL (CAS 75-65-0)	PEL	300 mg/m3
		100 ppm

**Biological limit values** No biological exposure limits noted for the ingredient(s).

**Exposure guidelines****Canada - Quebec OELs: Skin designation**

PROPYL ALCOHOL (CAS 71-23-8) Can be absorbed through the skin.

**Engineering controls** Not available.

**Personal protective equipment**

**Eye/face protection** Wear safety glasses with side shields (or goggles). Eye wash fountain and emergency showers are recommended.

**Skin protection** Wear suitable protective clothing. Wear protective gloves.

**Respiratory protection** When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Chemical respirator with organic vapor cartridge.

**9. Physical & Chemical Properties**

<b>Appearance</b>	Liquid.
<b>Physical state</b>	Gas.
<b>Form</b>	Aerosol.
<b>Color</b>	Clear
<b>Odor</b>	Strong.
<b>Odor threshold</b>	Not established
<b>pH</b>	Not applicable
<b>Vapor pressure</b>	> 100 mm Hg @20 °C
<b>Vapor density</b>	~4.3 (air = 1)
<b>Boiling point</b>	158 °F (70 °C)
<b>Melting point/Freezing point</b>	Not established
<b>Solubility (water)</b>	3 - 5 %
<b>Specific gravity</b>	1.29 - 1.32 @20 °C
<b>Relative density</b>	Not available.
<b>Flash point</b>	< 73.4 °F (< 23.0 °C) Tag Closed Cup
<b>Flammability limits in air, upper, % by volume</b>	8 %
<b>Flammability limits in air, lower, % by volume</b>	4 %
<b>Auto-ignition temperature</b>	> 914 °F (> 490 °C)

Material name: LPS® NoFlash NU

779 Version #: 01 Issue date: 05-22-2014

MSDS CANADA

4 / 9

<b>VOC</b>	70.1 % per US State and Federal Consumer Product Regulations
<b>Evaporation rate</b>	6 BuAc
<b>Percent volatile</b>	100 %
<b>Partition coefficient (n-octanol/water)</b>	> 1
<b>Other data</b>	
<b>Decomposition temperature</b>	Not established
<b>Flammability (solid, gas)</b>	Not applicable.
<b>Heat of combustion</b>	12 kJ/g

## 10. Chemical Stability & Reactivity Information

<b>Chemical stability</b>	Material is stable under normal conditions.
<b>Conditions to avoid</b>	Avoid heat, sparks, open flames and other ignition sources. Contact with incompatible materials.
<b>Incompatible materials</b>	Aluminum. Alkali earth metals. Alkaline metals.
<b>Hazardous decomposition products</b>	Carbon oxides. Hydrogen bromide. Hydrogen fluoride.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.

## 11. Toxicological Information

### Toxicological data

Components	Species	Test Results
1,2 Butylene Oxide (CAS 106-88-7)		
<b>Acute</b>		
<i>Dermal</i>		
LD50	Rabbit	2100 mg/kg
<i>Inhalation</i>		
LC100	Rat	8000 mg/l, 4 Hours
<i>Oral</i>		
LD50	Rat	500 mg/kg
n-Propyl Bromide (CAS 106-94-5)		
<b>Acute</b>		
<i>Dermal</i>		
LD50	Rabbit	>= 10 ml/kg
	Rat	> 2000 mg/kg
<i>Inhalation</i>		
LC50	Rat	14374 ppm
		7000 mg/l, 4 Hours
		253 mg/l, 30 Minutes
		35 mg/m3
		25 - 35 mg/l
<i>Oral</i>		
LD50	Rabbit	540 mg/kg
	Rat	> 2000 mg/kg
<i>Other</i>		
LD50	Mouse	2.5 g/kg
	Rat	2.9 g/kg
PROPYL ALCOHOL (CAS 71-23-8)		
<b>Acute</b>		
<i>Dermal</i>		
LD50	Rabbit	4032 mg/kg

Components	Species	Test Results
<i>Inhalation</i>		
LC50	Rat	> 51.91 mg/l
<i>Oral</i>		
LD50	Mouse	5467 mg/kg
	Rabbit	2.8 g/kg
	Rat	1870 mg/kg
		1.87 g/kg
<i>Other</i>		
LD50	Mouse	3125 mg/kg
	Rat	590 mg/kg
TERT-BUTANOL (CAS 75-65-0)		
<b>Acute</b>		
<i>Oral</i>		
LD50	Rabbit	3.6 g/kg
	Rat	3.5 g/kg
<i>Other</i>		
LD50	Mouse	0.9 g/kg
<b>Acute effects</b>	Harmful if swallowed. Narcotic effects. May cause respiratory irritation.	
<b>Sensitization</b>	Based on available data, the classification criteria are not met.	
<b>Local effects</b>	Harmful if swallowed. Irritating to eyes and skin. Irritating to respiratory system.	
<b>Chronic effects</b>	Prolonged inhalation may be harmful. May cause damage to organs through prolonged or repeated exposure.	
<b>Carcinogenicity</b>	Suspected of causing cancer.	
<b>ACGIH Carcinogens</b>		
PROPYL ALCOHOL (CAS 71-23-8)	A4 Not classifiable as a human carcinogen.	
TERT-BUTANOL (CAS 75-65-0)	A4 Not classifiable as a human carcinogen.	
<b>IARC Monographs. Overall Evaluation of Carcinogenicity</b>		
1,2 Butylene Oxide (CAS 106-88-7)	2B Possibly carcinogenic to humans.	
<b>Skin corrosion/irritation</b>	Causes skin irritation.	
<b>Serious eye damage/irritation</b>	Causes serious eye irritation.	
<b>Mutagenicity</b>	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.	
<b>Reproductive effects</b>	May damage fertility or the unborn child.	
<b>Teratogenicity</b>	Avoid exposure to women during early pregnancy.	
<b>Symptoms and target organs</b>	Irritating to eyes, respiratory system and skin. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause redness and pain. Vapors have a narcotic effect and may cause headache, fatigue, dizziness and nausea. Behavioral changes. Narcosis. Decrease in motor functions.	
<b>Synergistic materials</b>	Not available.	
<b>Further information</b>	Reproductive toxicity. Symptoms may be delayed.	

## 12. Ecological Information

### Ecotoxicological data

Components	Species	Test Results
n-Propyl Bromide (CAS 106-94-5)		
<b>Aquatic</b>		
Fish	LC50	Fathead minnow (Pimephales promelas) 67.3 mg/l, 96 hours

Components	Species		Test Results
PROPYL ALCOHOL (CAS 71-23-8)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	3339 - 3977 mg/l, 48 hours
Fish	LC50	Bleak (Alburnus alburnus)	3000 - 4000 mg/l, 96 hours
TERT-BUTANOL (CAS 75-65-0)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	4607 - 6577 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	6130 - 6700 mg/l, 96 hours
Ecotoxicity	Harmful to aquatic life with long lasting effects.		
Environmental effects	Harmful to aquatic organisms.		
Aquatic toxicity	May cause long-term adverse effects in the aquatic environment.		
Persistence and degradability	Not inherently biodegradable.		
Partition coefficient			
LPS® NoFlash NU			> 1
ETHANE, 1,1,1,2-TETRAFLUORO-(HFC-134a)			1.06
n-Propyl Bromide			2.1
PROPYL ALCOHOL			0.25
TERT-BUTANOL			0.35
Mobility in environmental media	Readily absorbed into soil.		
Other adverse effects	None known.		

### 13. Disposal Considerations

<b>Disposal instructions</b>	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Contents under pressure. Do not puncture, incinerate or crush. Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.
<b>Waste from residues / unused products</b>	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
<b>Contaminated packaging</b>	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied. Do not re-use empty containers.

### 14. Transport Information

<b>TDG</b>	
<b>UN number</b>	UN1950
<b>UN proper shipping name</b>	AEROSOLS, non-flammable
<b>Transport hazard class(es)</b>	
<b>Class</b>	2.2
<b>Subsidiary risk</b>	-
<b>Packing group</b>	Not applicable.
<b>Environmental hazards</b>	Not available.
<b>Special precautions for user</b>	Read safety instructions, MSDS and emergency procedures before handling.
<b>IATA</b>	
<b>UN number</b>	UN1950
<b>UN proper shipping name</b>	Aerosols, non-flammable
<b>Transport hazard class(es)</b>	
<b>Class</b>	2.2
<b>Subsidiary risk</b>	-
<b>Packing group</b>	Not applicable.
<b>Environmental hazards</b>	No.
<b>ERG Code</b>	2L
<b>Special precautions for user</b>	Read safety instructions, MSDS and emergency procedures before handling.

**Other information**

**Passenger and cargo aircraft** Allowed.

**Cargo aircraft only** Allowed.

**IMDG**

**UN number** UN1950

**UN proper shipping name** AEROSOLS, non-flammable

**Transport hazard class(es)**

**Class** 2.2

**Subsidiary risk** -

**Label(s)** 2.2

**Packing group** Not applicable.

**Environmental hazards**

**Marine pollutant** No.

**EmS** F-D, S-U

**Special precautions for user** Read safety instructions, MSDS and emergency procedures before handling.

**IATA; IMDG; TDG****15. Regulatory Information****Canadian regulations**

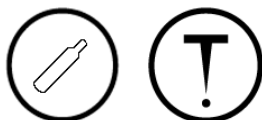
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

**WHMIS status**

Controlled

**WHMIS classification**

A - Compressed Gas  
D2A - Other Toxic Effects-VERY TOXIC  
D2B - Other Toxic Effects-TOXIC

**WHMIS labeling****International Inventories**

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes



Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)  
 A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

## 16. Other Information

<b>Disclaimer</b>	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
<b>Prepared by</b>	Not available.