MATERIAL SAFETY DATA SHEET
LPS Force 842° Dry Moly Lubricant

Revision 4 **Revision Date: 11/10/08** **Supercedes: 4/25/08**

Section 1 – Identification

Product Name:	LPS Force 842°™ Dry Moly Lubricant
Part Number:	02516, C02516
Chemical Name:	Aliphatic and Oxygenated Hydrocarbon mixture
Product Use:	A fast-evaporating dry-film lubricant designed for reducing sliding friction under high loads.
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 won't 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, don't hesitate to call us at 800/241-8334.

Worker Toxicity

FORCE 842°™ DRY MOLY LUBRICANT is a fast-evaporating dry-film lubricant designed for assembly and break-in lubrication. It contains isohexane and isopropyl alcohol which can be irritating to skin at a minimum and if handled improperly can be dangerous. We suggest you wear gloves and avoid extended exposure to unprotected 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 FORCE 842°™ DRY MOLY LUBRICANT 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 even a self-contained breathing apparatus may be necessary. For more exposure and first aid information, refer to MSDS Sections 2, 8 and 11.

Flammability

FORCE 842°™ DRY MOLY LUBRICANT is extremely flammable, having a flash point of less than (-17°C). Do not spray in or around live electrical equipment or ignition sources. Store product away from heat sources.

Disposal

If you spill FORCE 842°™ DRY MOLY LUBRICANT notify the proper environmental or safety department at your company right away. If FORCE 842°™ DRY MOLY LUBRICANT becomes contaminated with another substance and is rendered unusable, the resulting mixture will fall under at least one hazardous classification. See section 13 for more details.

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: Extremely Flammable. Eye Irritant. Vapor Harmful. Contents under pressure. Harmful or Fatal if Swallowed.

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.

Inhalation: Excessive inhalation of vapors can cause irritation of the respiratory tract, nausea, dizziness or headache.

Ingestion: Product has a low order of acute oral toxicity, but ingestion of large quantities may cause nausea, vomiting, and gastrointestinal irritation. May cause injury if aspirated into lungs.

Potential Chronic Health Effects:

Carcinogenic Effects: NTP: No **OSHA:** No **ACGIH:** No

Mutagenic Effects: None

Teratogenic Effects: This material (or component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to human is uncertain.

Target Organs:
Prolonged and repeated exposure to n-hexane may cause peripheral neuropathy by damaging peripheral nerve tissue (that of the arms and legs) and result in muscular weakness and loss of sensation. Prolonged and repeated inhalation of high levels of mixed isomers of hexane resulted in kidney damage in male rats. The effects observed are the same as those seen in male rats exposed to other hydrocarbons. The mechanism by which these chemicals cause the characteristic kidney toxicity is unique to the male rat and the kidney effects are not expected to occur in man. Breathing isopropanol vapors has caused damage to the lining of the middle ear in experimental animals. The relevance of this finding to humans is uncertain. Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals: liver abnormalities, kidney damage. Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans: central nervous system effects.

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.

Section 3 – Composition / Information on Ingredients

INGREDIENT NAME	CASRN	Weight Percent
Isopropanol	67-63-0	20 - 30%
2-methylpentane	107-83-5	20 - 30%
3-methylpentane	96-14-0	5 - 15%
2,3-dimethylbutane	79-29-8	5 - 15%
2,2-dimethylbutane	75-83-2	1 - 5%
Molybdenum Disulfide	1317-33-5	1 - 5%
n-hexane	110-54-3	1 - 2%
Propane/Isobutane Blend Propellant	68476-85-7	15 - 25%

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 and carbon dioxide.

General Fire Hazards: This item is a highly flammable aerosol. High heat will cause explosive rupture of containers and the rapid spread of fire.

Firefighting media: Use DRY chemical powder, CO_2, 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:** See sections 6, 7, 8 and 15.

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: Containers may explode when heated and overwhelm sprinkler systems.

Section 6 – Accidental Release Measures

Containment Procedures	**Small Spill and Leak:**	Eliminate ignition sources. Absorb with an inert material and dispose of properly.
	Large Spill and Leak:	Eliminate ignition sources, 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	Remove all sources of ignition. Ventilate area. Wear appropriate protective equipment during cleanup.	

Section 7 – Handling and Storage

Handling: DO NOT spray into or around ignition sources. After handling, always wash hands thoroughly with soap and water. Use only with adequate ventilation. Avoid breathing vapors or spray mists.

Storage: Keep container closed and in a cool, well-ventilated area. Avoid all sources of ignition (spark or flame). Store below 120°F. *Store aerosols as Level 3 Aerosol (NFPA 30B).*

Section 8 – Exposure Controls / Personal Protection

Exposure Guidelines:

Component	CASRN	OSHA TWA-PEL	OSHA STEL	ACGIH-TLV	ACGIH-STEL	NIOSH REL
Isopropanol*	67-63-0	400 ppm	Not Established	200 ppm	1000 ppm	400 ppm
2-Methylpentane*	107-83-5	500 ppm	1000 ppm	500 ppm	1000 ppm	100 ppm
3-Methylpentane*	96-14-0	500 ppm	1000 ppm	500 ppm	1000 ppm	100 ppm
2,3-Dimethylbutane*	79-29-8	500 ppm	1000 ppm	500 ppm	1000 ppm	100 ppm
2,2-Dimethylbutane*	75-83-2	500 ppm	1000 ppm	500 ppm	1000 ppm	100 ppm
Molybdenum Disulfide*	1317-33-5	15 mg/m^3	Not Established	10 mg/m^3	Not Established	Not Established
n-Hexane*	110-54-3	500 ppm	Not Established	50 ppm	Not Available	50 ppm
Propane/Isobutane Blend Propellant	68476-85-7	Not Established	Not Established	1000 ppm	Not Established	Not Established

*Note: Exposure guidelines provided by supplier.

Engineering measures	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	Normally no hand protection is required; however, if product will be sprayed for an extended period, "overspray" onto skin may occur. If so, use chemical resistant gloves (i.e., Nitrile, PVA) conforming to appropriate regulations. Please observe the instructions regarding permeability and breakthrough time that are provided by the supplier of the gloves.
Respiratory protection	Typical use of this product under normal conditions does not require the use of respiratory protection. If airborne concentrations are above the applicable exposure limits (listed above), use NIOSH approved respiratory protection (i.e., organic vapor cartidge).

Section 9 – Physical and Chemical Properties

Appearance:	Liquid.	**Color:**	Dark gray / black
Odour/Taste:	Characteristic	**Evaporation Rate:**	<1(Ethyl Ether =1)
Solubility Description:	<25% by weight.	**Flash Point:**	< -17°C (-0°F) bulk liquid
Odour Threshold:	Not Determined.	**Decomposition Temperature:**	Not Determined.
Boiling Point:	61°C(141°F)	**Flash Point Method:**	TCC
Specific Gravity (Water=1):	0.74-0.76	**Auto Ignition Temperature:**	306°C (582.8°F)
Vapor Density (air=1):	~3.0	**Partition Coefficient (octanol/water):**	<1
Vapor Pressure:	47 kPa @ 38 °C		
pH:	Not applicable	**Volatiles:**	95%
Flammable limits (estimated):	LOWER: 0.6% UPPER: 7%	**Viscosity:**	<14 mm²/sec. @ 25°C
V.O.C. content	95%, 712 g/L, 5.94#/gal per CARB	**Melting Point:**	Not Applicable

Section 10 – Chemical Stability and Reactivity

Chemical Stability:	Product is stable under recommended storage conditions.
Conditions to Avoid:	Keep away from heat and ignition sources. Exposure to direct sunlight for extended periods. Temperatures in excess of 50°C.
Incompatibility:	Extremely reactive or incompatible with oxidizing agents.
Hazardous Decomposition:	Combustion will generate smoke, possibly thick and choking, resulting in zero visibility and combustion products include carbon monoxide and carbon dioxide.
Hazardous Polymerization:	Will not occur.

Section 11 – Toxicological Information

A: General Product Information

An acute toxicity study of this product has not been conducted. Information given in this section relates only to individual constituents contained in this preparation.

B: Component Analysis

Component	CASRN	LC-50	LD-50
Isopropanol	67-63-0	13 g/kg	6 g/kg acute oral/ rat
2-methylpentane	107-83-5	> 3125 ppm / 4 hours/rat	Not Established
3-methylpentane	96-14-0	Not Established	Not Established
2,3-dimethylbutane	79-29-8	Not Established	Not Established
2,2-dimethylbutane	75-83-2	Not Established	Not Established
Molybdenum Disulfide	1317-33-5	>2820 mg/m^3 /4H/rat	>2 gm/kg/oral/rat
n-hexane	110-54-3	150000 mg/m^3/2H/rat	25 g/kg acute oral/ rat
Propane/Isobutane Blend Propellant	68476-85-7	Not established	Not appropriate

Section 12 – Ecological Information

Mobility: Semi-volatile. Readily absorbed into soil.

Persistence and degradability: Only slightly biodegradable.

Bioaccumulative potential: Minimal bioaccumulation potential

Other adverse effects: None known.

Ecotoxicology

Effect on Organisms	Component	CASRN	Test	Species	Results
Acute Toxicity on Fishes	n-hexane	110-54-3	48-hr LC_{100}	Leuciscus idus melanotus	260,000 µg/L
	Isopropanol	67-63-0	24-hr LC_{50}	Carassius auratus	5,000,000 µg/L
Acute Toxicity on Daphnia	n-hexane	110-54-3	24-hr LC_{50}	Daphnia magna	50,000 µg/L
	Isopropanol	67-63-0	24-hr LC_{50}	Daphnia magna	10,000,000 µg/L
Bacterial inhibition	No Data Available				
Growth inhibition of algae	n-hexane	110-54-3	EC_{50}	Anabaena inaequalis	1.70%
	Isopropanol	67-63-0	48-hour EC_{50}	Scenedesmus quadricauda	1,800,000 µg/L
Bioaccumulation in fish	No Data Available				

Section 13 – Disposal Considerations

Waste Status: Aerosol products, if depressurized and emptied to less than 2.5 cm of fluid contents are classified as non-hazardous waste under 40 CFR 261.7 (U.S.). If disposed of in its received form, this item carries waste codes D001 and D003. (U.S.)

Disposal: Waste must be disposed of in accordance with national, regional and local environmental control 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 – Transportation 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 Already on box
Road/Rail - ADR/RID :	**UN no:**	1950	**ADR Class:**	2
	Packing group:	NA	**Classification code:**	5F
	Name and Description:	AEROSOLS, Flammable	**Hazard ID no:**	NA
	Labeling:	2.1		
IMDG-IMO	**UN no:**	1950	**Class:**	2
	Shipping Name:	AEROSOLS	**Subsidiary Risk:**	2.1
	Packing Instructions:	P003, LP02	**Packing group:**	NA
	Marine pollutant:	NO	**EmS:**	F-D, S-U
IATA-ICAO:	**UN no:**	1950	**Class:**	2.1
	Shipping Name:	AEROSOLS, Flammable	**Subclass**	NA
	Packing instructions:	203, Y203 (Ltd Qty)	**Packing group:**	NA
	Labeling:	Flammable Gas		

Section 15 – Regulatory Information

U.S. Federal Regulations

RCRA Hazardous Waste No.: D001, D003

Comprehensive Environmental Response and Liability Act of 1980 (CERCLA): n-hexane- 5000 pounds

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 (aerosols only), 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):110-54-3 n-hexane 3% max.
95-63-6 1, 2, 4-Trimethylbenzene 0.4% max.

Section 112 Hazardous Air Pollutants (HAPs): n-hexane

State Regulations

New Jersey RTK: 2-methylpentane 107-83-5 • Propane/Isobutane Blend Propellant 68476-85-7 • 3-methylpentane 96-14-0 • 2, 3-dimethylbutane 79-29-8 • 2, 2,-dimethylbutane 75-83-2 • Isopropanol 67-63-0 • n-hexane 110-54-3

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

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

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):

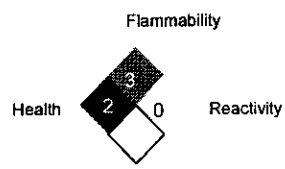
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

WHMIS Classification: Aerosol
Class A, Class B5, Class D2A, 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

	HMIS 1996		HMIS III		NFPA
MSDS# 12516 **Responsible Name:** **Clea Johnson** **Regulatory Affairs Coordinator**	Health:	2	Health:	2*	
	Flammability:	3	Flammability:	4	
	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 Johnson, Regulatory Affairs Coordinator
LPS Laboratories, A division of Illinois Tool Works