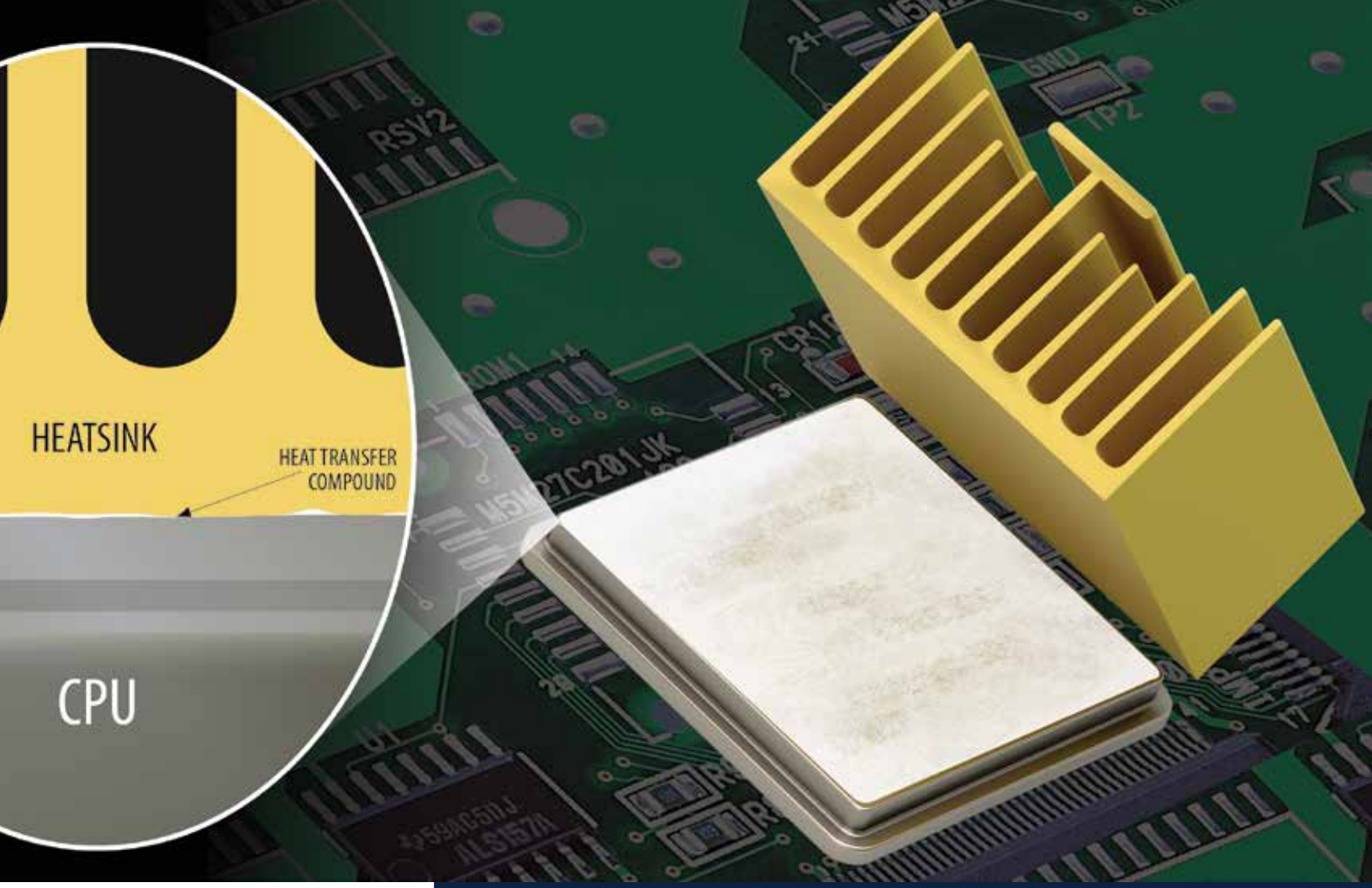
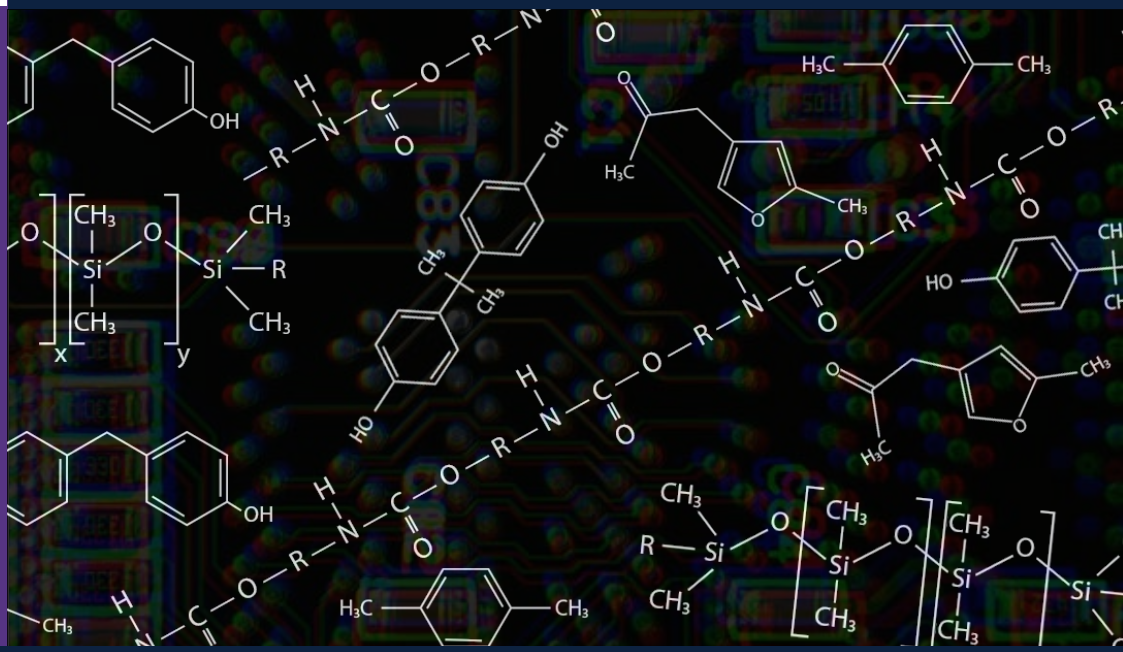


MG Chemicals

ONE COMPANY... MANY SOLUTIONS

SPECIALTY GREASES

- AUTOMOTIVE
- AEROSPACE
- TRANSPORT
- MARINE
- MEDICAL
- TELECOMMUNICATIONS
- CONSUMER ELECTRONICS
- UTILITIES



WHAT IS MG CHEMICALS?

MG Chemicals is a manufacturer and wholesaler of chemical products for the electronics industry. Our chemical products include dusters and circuit coolers, electronic cleaners, flux removers, contact cleaners, protective coatings, epoxies, adhesives, RTV silicones, lubricants, EMI/RFI shielding coatings, thermal management products, prototyping supplies, solders and more. We also distribute related non-chemical products such as wipes, swabs, brushes, desoldering braids, copper-clad boards and 3D printing filaments.

MG SERVICE

MG Chemicals understands that setting up production involves multiple challenges. Our service team has years of experience in production and equipment use, and understands the various technical issues you may encounter during planning, pilot studies and production runs. To overcome these challenges, we offer the following professional services.

MG Chemicals can

- Provide advice on equipment and materials
- Assist with setup and troubleshooting
- Review your proposed application processes
- Suggest ways of optimizing and customizing processes to best meet your needs
- Offer training on the proper use of our products

Quality Assurance

Since 1955, MG Chemicals has provided the North American electronics industry with a full line of high performance chemicals and accessories. The MG Chemicals manufacturing facility operates under the ISO 9001 Quality System Standard. All products undergo MG Chemicals' design process, including the testing and analysis of each product to maximize performance, user safety, environmental safeguards and market desirability.

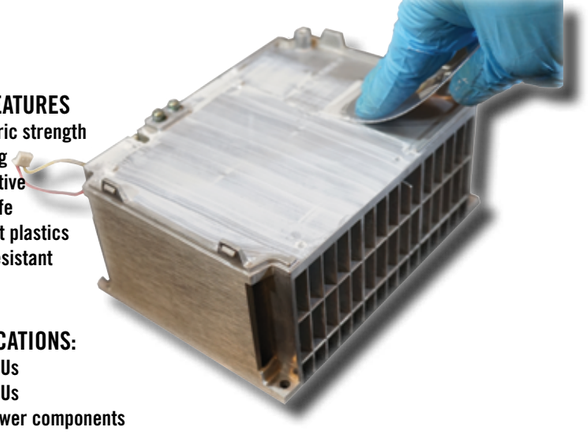
Customer Care

Customer care is what separates MG Chemicals from the rest. Our commitment to all of these principles focuses on getting you the quality product and support you deserve.

TABLE OF CONTENTS

THERMALLY CONDUCTIVE GREASES

MG Chemicals' thermal greases are made from high quality lubricants mixed with thermally conductive fillers. They are designed to meet a wide variety of thermal requirements from the simplest to the most demanding of applications. By eliminating gaps between bonded surfaces, it allows for improved heat transfer and dissipation from components. Our thermal greases are capable of lowering contact resistance and improving mating between irregular surfaces. By allowing components to transfer heat more effectively, thermal greases result in increased performance and extended product life.



BENEFITS & FEATURES

- High dielectric strength
- Non-bleeding
- Non-conductive
- Long shelf life
- Safe on most plastics
- Corrosion resistant

APPLICATIONS:

- CPUs
- GPUs
- Power components
- LEDs
- Chipsets
- Heatsinks

Silicone Heat Transfer Compound - 860

This product is a "traditional" thermally conductive grease based on zinc oxide and silicone oil that provides good thermal conductivity across a wide range of operating temperatures. Silicone thermal greases are preferred in applications with high operating temperatures where silicone migration is not a concern.

- Broad constant service temperature range -40 °C to 200 °C
- Good thermal conductivity: 0.66 W/(m·K)

Cat. Number	Packaging	Net Volume		Net Weight	
860-4G	Pouch	1.7 mL	0.06 fl oz	4 g	0.14 oz
860-60G	Jar	25 mL	0.84 fl oz	60 g	2.11 oz
860-150G	Tube	62.5 mL	2.11 fl oz	150 g	5.29 oz
860-1P	Can	470mL	15.9 fl oz	1.13 kg	2.49 lb

Super Thermal Grease II - 8616

This product is an extremely thermally conductive grease designed to improve thermal conductivity between irregular metal surfaces. It is ideal for applications where maximum heat flow is a must. It has a non-silicone oil base, and is extremely stable under temperature cycling. In addition, it is free of metallic fillers, and therefore eliminates the capacitance issues common to other issues that arise with othe silver-filled, high-end thermal greases. This product was designed for use in electronic applications where heat flow is critical.

- Silicone-free
- Excellent constant service temperature range: -68 °C to 165 °C
- Extreme thermal conductivity: 1.78 W/(m·K)

Cat. Number	Packaging	Net Volume		Net Weight	
8616-3ML	Syringe	3 mL	0.01 fl oz	8.0 g	0.28 oz
8616-25ML	Jar	25 mL	0.84 fl oz	67.2 g	2.37 oz
8616-85ML	Tube	86 mL	2.93 fl oz	228 g	8.21 oz
8616-1P	Jar	483 mL	1 pint	1.3 kg	2.86 lb
8616-1G	Pail	3.78 L	1.0 gal	10.1 kg	22.4 lb

Super Thermal Grease III - Zinc Oxide Free - 8617

This product is a low thermal resistance, non-corrosive grease. It uses an extremely thermally stable synthetic oil base that is electrically insulating. This product was formulated without the use of zinc oxide, and is therefore a non-regulated product in all sizes.

- Zinc oxide free—ships non-regulated in all sizes
- Silicone-free
- Excellent constant service temperature range: -68 °C to 165 °C
- Very high thermal conductivity: 1.0 W/(m·K)

Cat. Number	Packaging	Net Volume		Net Weight	
8617-85ML	Tube	85 mL	2.87 fl oz	166 g	5.87 oz
8617-1P	Jar	473 mL	1 pint	926 g	2.04 lb
8617-1G	Pail	3.78 L	1.0 gal	7.4 kg	16.3 lb

Thermally Conductive Grease Comparison Chart

MG Cat. No.	860	8616	8617
Conductive Filler	Zinc oxide, silica	Aluminum oxide, zinc oxide	Aluminum oxide
Base Material	Silicone oil	Synthetic oil	Synthetic oil
VOC	27%	17.5%	69%
Shelf Life	5 y	5 y	5 y
Physical Properties			
Color	White	White	White
Odor	Odorless	Odorless	Odorless
Density @25 °C	2.40 g/mL	2.69 g/mL	1.96 g/mL
Viscosity	Thixotropic paste	Thixotropic paste	Thixotropic paste
Evaporation Loss [a)]	0.1%	1.2%	2.3%
Oil Separation [b)]	0.7%	0.02%	1.0%
Dropping Point	>260°C	>300 °C	>308 °C
Water Washout @38 °C	0.1%	0.9%	1.5%
Worked Penetration [c)]	303	287	343
Oil Viscosity Index [d)]	N/A	>110 °C	>110 °C
Lubrication	No	No	No
Bleed Resistant	Yes	Yes	Yes
Corrosion Resistant	Yes	Yes	Yes
Electrical Properties			
Volume Resistivity	1.5×10^{15} Ω·cm	1.8×10^{11} Ω·cm	9.9×10^{9} Ω·cm
Volume Conductivity	6.7×10^{-16} S/cm	5.6×10^{-12} S/cm	1.0×10^{-10} S/cm
Dielectric Strength	400 V/mil	330 V/mil	450 V/mil
Breakdown Voltage	N/A	16 600 V	4 500 V
Dielectric Constant @1 000 cps	3.81	6.77	6.07
Dissipation Factor @1 000 cps	0.003	0.01	0.08
Thermal Properties			
Thermal Conductivity @25 °C	0.66 W/(m·K)	1.78 W/(m·K)	1.0 W/(m·K)
Contact Thermal Resistance @25 °C	0.57×10^{-3} (m²K)/W	0.24×10^{-3} (m²K)/W	0.71×10^{-3} (m²K)/W
Constant Service Temperature	-40 to 200 °C	-68 to 165 °C	-68 to 165 °C

a) Evaporation loss tested for 22 hours at 165 °C [329 °F].
b) Oil separation tested for 30 hours at 165 °C [329 °F].
c) 60 strokes
d) High oil viscosity index of over 100 indicates small oil viscosity changes with temperature

23 February 2017

4 grams Pouch

25 mL Jar

85 mL Tube

1 Pint Jar

1 Gallon Pail

ELECTRICALLY CONDUCTIVE GREASES

MG Chemicals offers a full line of electrically conductive greases formulated to improve electrical conductivity while providing protection against moisture and corrosion. These greases work by replacing air between surface irregularities and voids with conductive material, therefore lowering the electrical resistance between those surfaces.

BENEFITS & FEATURES:

- Safe on most plastics
- Corrosion resistant

APPLICATIONS:

- Gaskets for EMI shielding
- Prevents arching, pitting, hotspots, and welds between surfaces
- Ensures electrical contact between loose or vibrating parts
- Improves conductivity between irregular or pitted surfaces
- Car headlights
- Lubrication between moving parts
- Electrical sockets
- Bus bars

Carbon Conductive Grease - 846

This product is an economical, electrically conductive silicone grease formulated for improving electrical connections between sliding surfaces and parts. It provides excellent lubrication, inhibits corrosion, and protects against humidity.

846 is designed to lubricate, and it may cause shorts when used incorrectly. For a non-bleeding or non-migrating electrically conductive grease, see 847 Carbon Conductive Assembly Paste.

- Broad constant service temperature range: -50 °C to 200 °C
- Volume resistivity: 114 Ω·cm

Cat. Number	Packaging	Net Volume		Net Weight	
846-80G	Tube	76.2 mL	2.58 fl oz	80 g	2.82 oz
846-1P	Jar	495 mL	1 pt	520 g	1.1 lb

Silver Conductive Grease - 8463

This product is a conductive silicone grease formulated for improving both electrical and thermal connections between sliding surfaces and parts.

8463 is designed to lubricate, and it may cause shorts if used incorrectly. For a non-bleeding or non-migrating electrically conductive grease, see 847 Carbon Conductive Assembly Paste.

- Broad constant service temperature range: -50 °C to 200 °C

Cat. Number	Packaging	Net Volume		Net Weight	
8463-7G	Syringe	3.0 mL	0.10 fl oz	7.0 g	0.24 oz

Carbon Conductive Assembly Paste - 847

This product is an electrically conductive, non-bleeding grease grease that can be used to improve electrical connections between non-moving surfaces and parts. It was designed to work in the same manner as a heat sink grease, only electrically conductive, and is odeal for use on bus-bars and other applications where a flowable grease is undesirable. It is non-bleeding and stays where it is applied, so short circuits are less of a concern. In addition, it inhibits corrosion, has a wide operating temperature range, a long service life, and does not contain silicone.

- Silicone-free
- Non-bleeding even at high temperatures
- Broad constant service temperature range: -50 °C to 200 °C
- Volume resistivity: 46 Ω·cm
- Contains Corrosion inhibitors

Cat. Number	Packaging	Net Volume		Net Weight	
847-25ML	Jar	25 mL	0.84 fl oz	26.8 g	0.94 oz
847-1P	Jar	466 mL	15.7 fl oz	0.500 g	17.6 oz
847-1G	Pail	3.78 L	1.0 gal	4.05 kg	8.94 lb

Premium Carbon Conductive Grease - 8481

This product is an electrically conductive grease with a synthetic oil base that is silicone free and contains extra corrosion inhibitors, which makes it capable of withstanding 300 hours of salt fog testing (automotive grade). It is a premium grease designed specifically to be electrically conductive while providing extreme levels of corrosion protection. It is very stable and generally does not separate even under extreme temperature cycling.

Similar to 846 and 8481, it lubricates and improves electrical connections between sliding surfaces and parts.

8481 is designed to lubricate, and it may cause shorts if used incorrectly. For a non-bleeding or non-migrating electrically conductive grease see 847 Carbon Conductive Assembly Paste.

- Silicone-free
- Non-bleeding even under temperature cycling
- Broad constant service temperature range: -68 °C to 165 °C
- Volume resistivity: < 160 Ω·cm
- Contains corrosion inhibitors

Cat. Number	Packaging	Net Volume		Net Weight	
8481-1	Tube	85 mL	2.87 fl oz	85.4 g	3.07 oz
8481-2	Jar	453 mL	15.3 fl oz	0.465 g	1.03 lb
8481-3	Pail	3.78 L	1.0 gal	3.79 kg	8.37 lb

Electrically Conductive Grease Comparison Chart

MG Cat. No.	8463	8481	846	847
Conductive Filler	Carbon, Silver	Carbon, Graphite	Carbon	Carbon
Base Material	Silicone oil	Synthetic oil	Silicone oil	Synthetic oil
VOC	31%	4%	0%	0%
Shelf Life	5 y	5 y	5 y	5 y
Physical Properties				
Color	Silver	Black	Black	Black
Odor	Odorless	Odorless	Odorless	Odorless
Density @25 °C	2.35 g/mL	1.01 g/mL	1.05 g/mL	1.07 g/mL
Viscosity	Thixotropic	Thixotropic	Thixotropic	Thixotropic
Evaporation Loss [a)]	0.5%	2.0%	2.6%	0.3%
Oil Separation [b)]	10%	5.0%	0.4%	1.8%
Dropping Point	>304 °C	>300 °C	>304 °C	>304 °C
Water Washout @38 °C	0.6%	0.9%	1.3%	0.2%
Worked Penetration [c)]	N/A	315	269	174
Oil Viscosity Index [d)]	N/A	>110 °C	N/A	>110 °C
Lubrication	High	Very high	Very high	Very low
Bleed Resistant	No	Yes	No	Yes
Emcor Rust Test [g)]	N/A	#0	#1	#3
Electrical Properties				
Volume Resistivity	N/A	160 Ω·cm	114 Ω·cm	46 Ω·cm
Volume Conductivity	N/A	0.006 S/cm	0.009 S/cm	0.02 S/cm
Thermal Properties				
Thermal Conductivity @25 °C	~0.45 W/(m·K)	0.29 W/(m·K)	N/A	N/A
Constant Service Temp.	-50 to 200 °C	-68 to 165 °C	-50 to 200 °C	-68 to 165 °C

N/A=Not Available
a) Evaporation loss tested for 22 hours at 165 °C [329 °F].
b) Oil separation tested for 30 hours at 165 °C [329 °F].
c) 60 strokes, ½ scale
d) High oil viscosity index of over 100 indicates small oil viscosity changes with temperature
e) Evaporation loss tested for 44 h at 25 °C [77 °F].
f) Boeing test found no separation after thermal cycling ten cycles from -40 to 121 °C [-40 to 250 °F].
g) Tested using distilled (DI) water. Emcor corrosion rating is ranked from 0 (no corrosion) to 4 (corrosion).

7 grams Syringe

85 mL Tube

25 mL Jar

1 Pint Jar

1 Gallon Pail

DIELECTRIC GREASE

Translucent Silicone Grease - 8462

This product is a water repelling, dielectric grease that provides superior corrosion and arcing resistance for connectors. Apply it to connectors to provide instant protection from moisture, humidity, oxidation, arcing and static discharge. It is thick and non-melting and will stay where it is applied. It is safe on a wide range of metals, rubbers, plastics and elastomers. Although it is electrically insulating, it can also be used to fill the gaps between tight-fitting connectors to prevent moisture or humidity from seeping in, and to provide lubrication.

BENEFITS & FEATURES:

- Dielectric strength of 500 V/mil
- Thick grease that stays where it is applied
- Non-melting—stable over a wide temperature range and conditions
- Good corrosion protection
- Excellent electrical insulating and high dielectric strength
- Protects from arching and static
- Non-conductive—no risk of shorts due to silicone migration
- Usable for incidental food contact—conforms to 21 CFR section 178.3570
- Odorless and non-toxic

APPLICATIONS:

- Circuit breaker lubrication
- Arcing prevention
- Gap filling between connectors

Cat. Number	Packaging	Net Volume		Net Weight	
8462-85ML	Tube	87.9 mL	2.97 fl oz	87 g	3.06 oz
8462-1P	Jar	473 mL	16.0 fl oz	468 g	1.03 lb
8462-1G	Pail	3.78 L	1.0 gal	3.74 kg	8.25 lb

LUBRICANTS

MG Chemicals' lubricants are formulated to provide lubrication for moving parts, corrosion protection, general purpose cleaning and static dissipation. The lubricants offer wide service temperature ranges and environmental stability, which improves equipment lifespan. It is safe on many plastics and rubbers and is ideal for use on metal fasteners, electronics, and much more.

Static Dissipative, Anti-Corrosive Grease- 8464

This grease is designed to lubricate and provide powerful protection against corrosion, while remaining stable at high temperatures and under extreme temperature cycling.

As well, it contains a small amount of conductive filler to prevent static buildup. It is extremely useful for protecting and lubricating metal parts in static sensitive applications in extreme environments

BENEFITS & FEATURES:

- Extreme corrosion resistance - passes 1000 hours of salt fog testing (aerospace grade)
- Excellent high temperature stability
- Will not separate under extreme temperature cycling
- Wide service temperature range of -68 °C to 165 °C
- Safe on plastics
- Silicone free

APPLICATIONS:

- Component lubrication
- Corrosion protection
- Discharging Ssatic build-up

Cat. Number	Packaging	Net Volume		Net Weight	
8464-1	Tube	85 mL	2.87 fl oz	178 g	6.29 oz
8464-2	Jar	468 mL	15.8 fl oz	985 g	34.7 oz

Lithium Grease - 8461

A general purpose lubricant with a smooth buttery cream-like texture, that provides superior lubrication and corrosion protection to moving parts.

BENEFITS & FEATURES:

- Reduces friction and wear on moving parts
- Retains consistency over a wide range of temperatures
- Provides good corrosion protection
- Service temperature range: -40 °C to 180 °C
- Silicone free

APPLICATIONS:

Lubricates and protects:

- Electronics plastic gears and sliding components
- Industrial machinery
- Various moving plastic and metal parts

Cat. Number	Packaging	Net Volume		Net Weight	
8461-85mL	Tube	85 mL	2.9 fl oz	85 g	3 oz
8461-1P	Tub	454 mL	15 fl oz	409 g	13 oz

Penetrating Oil - 8472

8472 Penetrating Oil rapidly dissolves corrosion and rust. It creeps into tiny spaces between close-fitting parts and quickly releases seized nuts, bolts, and other mechanical parts. It also cleans and lubricates metal parts and protects them from corroding again. What sets 8472 above the competition is the extreme corrosion protection it provides, its non-volatile and VOC-free formulation, and the fact that is is safe to use on plastics and painted surfaces

BENEFITS & FEATURES:

- Dissolves rust quickly
- Creeps into tiny spaces
- Provides extreme protection against rust and corrosion
- Excellent long-lasting general purpose lubricant
- Cleans grime, grease, rust and adhesives
- Safe on most plastics, seals, rubber, paint and coatings
- Will not dry out quickly
- Displaces moisture
- Lubricating film repels water and protects against abrasive particles
- Reduces wear, increasing equipment lifespan
- Low VOC's, no CFC's or chlorinated solvents
- Silicone-free

APPLICATIONS:

- Releasing: rusted bolts, nuts, screws, fasteners, pulleys, scales, tools, and other frozen metal mechanisms
- General industrial maintenance and repair work
- Lubricating close-fitting parts
- Displacing moisture
- Maintaining boating equipment and any mechanical equipment regularly subject to moist or wet conditions

Cat. Number	Packaging	Net Volume		Net Weight	
8472-450G	Aerosol	500 mL	1.05 pt	450 g	15.8 oz
8472-4L	Can	3.78 L	1 .0 gal	3.13 kg	6.91 lb
8472-20L	Pail	18.9 L	5.04 gal	15.6 kg	34.5 lb

Nu-Trol™ Contol Cleaner- 401B

Nu-Trol's unique blend of high purity solvents and a lubricating mineral oil is excellent for cleaning and lubricating delicate moving parts in electronics, such as controls, potentiometers, dials, switches, tuners, and servomechanisms. It is also good for general purpose cleaning and lubricating of moving parts for such things as locks, hinges, and power tools.

BENEFITS & FEATURES:

- Contains electronics-grade mineral oil
- Safe on plastics
- Moderate evaporation rate
- Non-aggressive - safe for use on vintage electronics
- Variable valve allows user to control the rate of flow

APPLICATIONS:

- Controls
- Potentiometers
- Dials
- Switches
- Tuners
- Servomechanisms
- Relays
- Power tools
- Locks
- Hinges

Cat. Number	Packaging	Net Volume		Net Weight	
401B-140G	Aerosol	188 g	6.35 fl oz	140 g	4.93 oz
401B-340G	Aerosol	457 mL	15.4 fl oz	340 g	11.9 oz

HEAD OFFICE

9347 - 193rd Street
Surrey, B.C., Canada
V4N 4E7
Phone 1-800-201-8822
1-604-888-3084
Fax 1-604-888-7754
Website mgchemicals.com

MANUFACTURING

1210 Corporate Drive
Burlington, Ontario, Canada
L7L 5R6
Phone 1-800-340-0772
1-905-331-1396
Fax 1-905-331-2682
Website mgchemicals.com

CUSTOMER SERVICE

NORTH AMERICA

Phone 1-800-340-0772
Fax 1-800-340-0773
Email East SalesEast@mgchemicals.com
Email west SalesWest@mgchemicals.com

EUROPE AND UK

Phone +44 1663 362888
Email SalesUK@mgchemicals.com

INTERNATIONAL

Phone 1-604-888-3084
Fax 1-604-888-7754
Email SalesIntl@mgchemicals.com

FOR SAFETY DATA SHEETS

mgchemicals.com/resources/datasheets

FOR TECHNICAL SUPPORT

mgchemicals.com/resources/technical-support
Toll-free line 1-800-340-0772
or +1 905 331-1396

Printed in Canada