

We will meet a broad spectrum of needs
from specialty lubricant to personal use,
including pure molybdenum disulfide.

■ Product Guide ■ Vol.2



Powder (Solid Lubricant)



P.3

- Molybdenum disulfide powder (about 1 micrometer \approx 1/1000 mm grayish black particle)
Bigger LM-11 > LM-12 > LM-13 Smaller
- Black type powder
Graphite (black lead), tungsten disulfide, etc
- White type powder
Fluorine powder, boron nitride, etc.

[Application example]

Addition to wire drawing stroke, metal mold coating and resin, addition to various grease, oils and coating agents

Molybdenum disulfide powder
Friction coefficient $\mu = 0.03$
Pressure proof load 2,900MPa



Grease



P.4-6

- Black grease: High performance grease with solid lubricant
Heat-resistant grease e.g.) LM-46 (Upper temperature limit : 230°C)
Cold-resistant grease e.g.) LM-48 (Cold-resistance temperature:-60°C)
High load-resistant grease e.g.) LM-49 (Pressure-proof load: 294MPa)
All-purpose grease e.g.) LM-47、LM-150
- White grease : White grease for resin
Grease for resin e.g.) LM-3000 series
- Special grease
Rust prevention grease e.g.) LM-190
Biodegradable grease e.g.) LM-191



Paste



P.7-8

- Black paste : High performance paste with solid lubricant
Setting-up paste e.g.) LM-82、LM-83
Heat-resistant paste e.g.) LM-32 (Upper temperature limit:450°C)
- Special paste
For ultra-high temperature and sear prevention e.g.) LM-901 aluminum special

[Application example]

Prevent nuts and washer of turbines, electric furnaces, etc. From scraping and searing



Oil

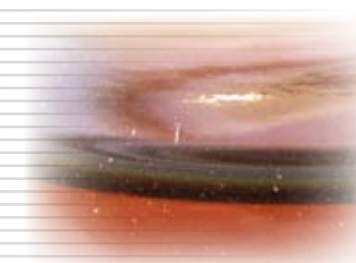


P.8

- High grade black oil : solid lubricant included
High performance black oil
Oil for addition e.g.) LM-81
Heat-resistant oil e.g.) LM-120

[Application example]

Add this oil to cylinders, motors, compressors, machine oils, etc
Used as bearings of drying machine and machine tool gear lubricant



Current Lubricant



P.9

- Current lubricant
Grease type S series
Oil type L series
Aerosol type LM-2002 (described in auto chemical)

[Application example]

Contact points of all electric equipment



Dry Coating



P.10

- Dry film surface treatment with solid lubricant/Special surface treatment/Base chemical conversion treatment
 - Dry coating with molybdenum disulfide
 - Teflon coating: lubricant, mold-release treatment, melting seizing
 - Nonadhesive treatment
 - Manganese phosphate treatment
 - Black oxide finish treatment

[Application example]

Crane joint bush part for construction equipment, cold forging, glass mold and mold-release lubricant, radiation-proof, lubricant in vacuum, car parts (pistons, metals gears, etc.)



Maintenance free !
For oil-avoiding areas !

Special shot-peening

WPC (Wonder Process Craft)

P.11

- Shot by super particle of 40 ~ 200 μ m
- Increase surface hardness by instant hardening and annealing with ultra-fast spray 100m/sec and over
- Keep oil and improve sliding performance through micro dimple formation

[Application example]

Car parts, metal parts, metal processing, cutting tools, molds, etc



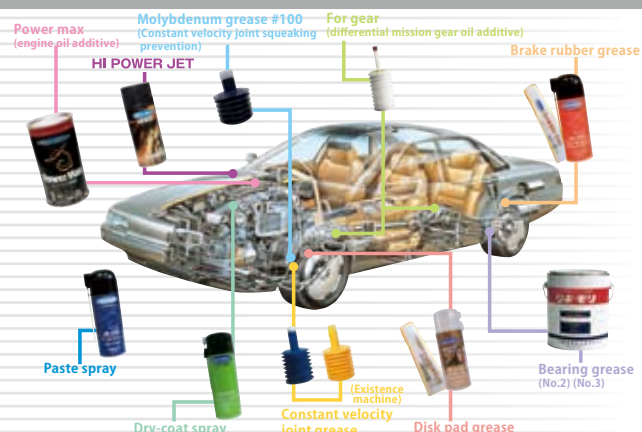
Increase surface strength dramatically

Auto chemical lubricant



P.12-13

- Lubricant for auto maintenance
 - Grease for brake: grease not to damage rubber
 - Grease for disk pads : grease for preventing squeaking
 - Grease for constant-velocity joints
 - Cartridge grease : Cartridge type for easy use
 - Silicon grease : Available for rubbers and plastics
 - Coupler grease
 - Electric grease
 - Engine oil additive
 - Differential mission gear oil additive
 - Engine tune-up agent : drive powerful engine performance
 - Various aerosols : Grease sprays, cleaners, penetration lubricant, rust prevention agent



Engineering Plastic



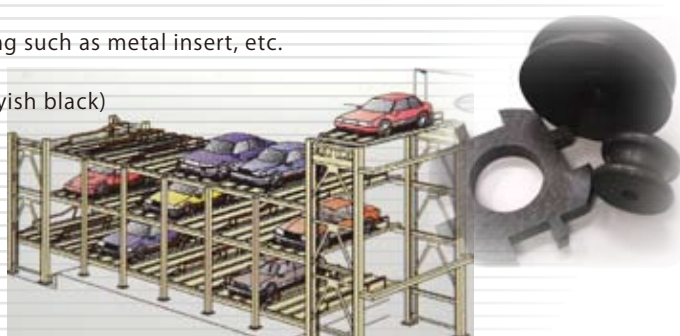
P.13

- Materials including boards, round bars, sheets, etc
- Cutting and molding treatment, finished product processing such as metal insert, etc.

[Types] LIQUI-MOLY nylon: with molybdenum disulfide (grayish black)
 MC nylon, white general-purpose nylon
 Polyimide
 Polyacetal (POM, etc)
 Fluorine contained resin (Teflon, etc)
 Polyethylene, extra-high polyethylene, etc

[Application example]

Door rollers for switching doors of railway cars, wheel for multi-story car parks, sliding board,



Personal Use



P.14-16

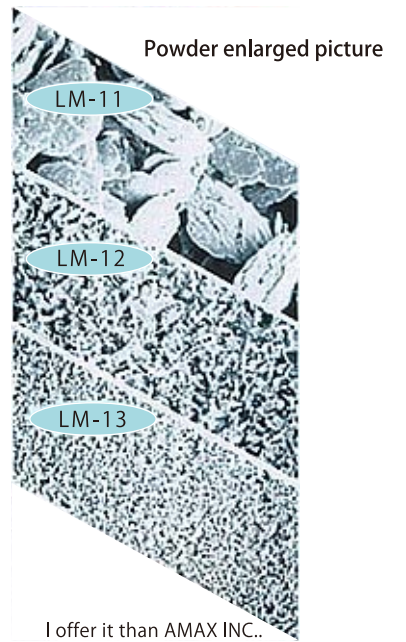
- A new product range to arrange professional-use products for personal use.
Available to purchase this product in GMS.

Molybdenum Disulfide Powder

Molybdenum disulfide is grayish black mineral composed of one molybdenum atom (Mo) and two sulfur atoms (S) in layers through the natural sulfurization of metal molybdenum underground.

MoS2 molecule is extremely small of 6.26 Å, whose particle (0.4 μm) has multiple layers (600-700 molecule layers). These layers are easy to be come off and each of them has a strong bond, which make the characteristics of lubricant agent.

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● Powder

Product Numbder	LM-11	LM-12	LM-13
Product Name	Z powder	NeO Z powder	SM powder
Attribute	Purity:98.2% and over Average particle size: 3-4 μm pH value:7.0	Purity:98.0% and over Average particle size: 0.7 μm pH value:6.0	Purity:98.0% and over Average particle size: 0.4 μm pH value:5.3
PV value(MPa・m/sec)	92		
Heat resitance (℃)	-180 ~ 450℃ (+1,100 ℃ in inert gas)		
Pressure resistance load(MPa)	2,842		
Friction coefficient (μ)	0.03		
Major use	1. Addition to oil, grease, etc. 2. Compound to plastic, various rubbers, etc. 3. Addition to sintered metals and carbons 4. Lubrication in the ultra cold temperature and ultra high vacuum condition		

How to measure particle size

【Fisher No.】

This is the most common method to use the gap between particles for measurement. Powder has a gap between particles, and the gap remains after compressing powder. If particles of various sizes are distributed to fill the gap, the total volume of the gap will become reduced in size. Therefore you can guess the distribution of particles of various sizes by measuring the gap. This is the method to calculate the average particle size by compressing powder, blowing air at a constant pressure and reading out the pressure drop to make out the ventilation rate (porosity = rate of gap volume).As it considers the particle shape, this method is effective to any powder whose shape is not sphere.

【Microtrac】

This is the method to use the laser diffraction. By lasering particles and reading the scattered light intensity, it calculates the particle size and the particle size distribution. As each particle has a different shape, its size is statistically decided by measuring a lot of particles with the same method, converting various sizes of particles into sphere. This method is a mainstream of measuring the particle size and is very effective to measure the particle size distribution.

Quick reference chart of industrial grease

Product number	LM-45	LM-46	LM-47	LM-47A*	LM-48S*	LM-48L*
Product name	Admac gear	B grease	L grease	L grease low temperature	Low temp grease	Low temp grease
Type	urea	benton	lithium	lithium	silicon	lithium
Color	Grayish black	grayish black	grayish black	grayish black	grayish black	light brown
NLGI No.	2	1*,2	0,1,2,3	0	2	1, 2
OT	-20 ~ 200℃	-15 ~ 230℃	-15 ~ 180℃	-40 ~ 180℃	-60 ~ 200℃	-40 ~ 130℃
Withstand pressure load	○	○	○	○	○	△
Water resistance	◎	△	△	△	△	△
Heat resistance	◎	◎	○	○	◎	△
Cold resistance	△	△	△	○	◎	○
Use	for gear, high adhesion	for heat resistance	for high-class all purpose		for extreme cold resistance	no MoS ₂

Product number	LM-49	LM-150	LM-160*	LM-190*	LM-191*	LM-3202*, 3302,3302F
Product name	H.D compound	MP grease	U grease	grease for rust prevention	bio grease	white grease
Type	lithium	lithium	urea	compound	lithium	lithium
Color	grayish black	grayish black	grayish black	light brown	light yellow	white
NLGI No.	2	1, 2	2	1, 2	2	2
OT	-20 ~ 180℃	-20 ~ 150℃	20 ~ 200℃	-20 ~ 150℃	-50 ~ 130℃	-40 ~ 150℃
Withstand pressure load	◎	○	○	◎	△	○
Water resistance	△	△	◎	◎	○	○
Heat resistance	○	△	◎	△	◎	△
Cold resistance	△	△	△	△	△	◎
Use	for high load resistance	universal	for high-class all purpose	for rust prevention no MoS ₂	biodegradation no MoS ₂	for plastic no MoS ₂

※ These products are made by order. Please contact us for delivery time and quantity (lot size).

- 1) PV value is a burn-in indicator for sliding bearings, calculated by multiplying contact pressure (P) by slipping velocity (V)>
- 2) S I unit conversion $1\text{MPa} \cdot \text{m/sec} = 10.2\text{kg/cm}^2 \cdot \text{m/sec}$ $1\text{MPa} = 10.2\text{kg/cm}^2$
- 2) NLGI (=National Lubricant Grease Institute) classification

NLGI No.	00	0	1	2	3
Mixing NLGI range (@25℃、60W)	400 ~ 430	355 ~ 385	310 ~ 340	265 ~ 295	220 ~ 250
Hardness	Semi fluid	Extremely soft	Soft	Regular	Rather hard

● Grease



LM-45 Admac Gear

Grease composed of urea grease with viscosity and adhesion, mixed with MoS₂. Has excellent water, heat and wear resistant properties and used for gear

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No. 2	-	120	0.16	Large open gear. Sliding parts of industrial machines which require adhesion, water/heat/wear resistance.	16kg / pail can



LM-46 B Grease

Grease composed of Benton grease mixed with MoS₂. Available to be used in wide temperature range (-15°C ~ 230°C)

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.1 [*] , 2	14	152	0.15	1. High-temperature valve 2. Sliding surfaces and bearings of drying furnace, etc. 3. Bolt tightening of hot parts such as turbines, etc.	2.5kg / 6pail box [*] 16kg / pail can

^{*} For NLGI No. 1 and 2.5kg/6 can box, please contact us for the delivery time and quantity (lot size).



LM-47 L Grease

All-purpose grease composed of lithium grease mixed with MoS₂. Has better abrasion resistance than general lithium and has superiority in extreme pressure property.

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.0,1,2,3	14	147	0.15	1. Bearings and sliding surfaces of electric motors, blowers, conduction machines, etc. 2. Equipment machines such as conveyors, etc. 3. Working machines, vibratory machines, etc.	2.5kg / 6can box 16kg / pail can



LM-47A^{*} L Grease for Low Temperature

Grease using synthetic oil partially as a base oil and available to be used as low temperature grade of LM-47.

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.0	14	147	0.15	Same as above in cold districts and for low temperature.	2.5kg / 6can box 16kg / pail can

^{*} These products are made by order. Please contact us for delivery time and quantity (lot size).



LM-48S^{*} Low Temp Grease (Cold Resistance Grease)

Grease for ultra cold temperature composed of silicon oil base grease mixed with MoS₂.

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.2	13	118	0.15	1. Gear bearing of vending machines, robots, etc. in cold districts 2. Bearings of conveyors in freezer 3. Sliding surfaces and bearings of airplanes and gauges for cold districts	2.5kg / 6can box 16kg / pail can

^{*} These products are made by order. Please contact us for delivery time and quantity (lot size).



LM-48L^{*} Low Temp Grease (Low Temperature Grease)

Grease based on high-purity refined mineral oil for low temperature without MoS₂. Not include solid lubricant agents

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.1,2	-	-	-	Various bearings and lubricated places of sliding surfaces operated under the condition of low temperature. Especially this is proven all-purpose grease for auto bodies.	2.5kg / 6can box 16kg / pail can

^{*} These products are made by order. Please contact us for delivery time and quantity (lot size).



LM-49 H.D Compound (Grease for High-Load)

High-load grease composed of lithium grease mixed with MoS₂ in high concentration. Have an effect on impact load and fretting corrosion.

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.2	26	294	0.08	1. Center turbines under impact load of railway vehicles. 2. Gears of conveyors and press machines. 3. Pins and pushes of rotary parts and sliding parts.	2.5kg / 6can box 16kg / pail can



LM-150 MP Grease (Multi-Purpose Grease)

Grease composed of lithium grease mixed with MoS₂. This is lithium-type general-purpose grease, available to be used in places needed for lubrication.

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.1,2	13	147	0.16	Bearing sliding parts for various machines	16kg / pail can



LM-160* U Grease (High-Class Multi-Purpose Grease)

Grease composed of urea grease mixed with MoS₂. Has high dropping point and little amount of evaporation in the high temperature. Has good water resistant property and little softening outflow.

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.2	20	196	0.15	1. Bearings of hot-air blowers 2. Bearings of continuous casters 3. Bearings of wet paper manufacturing machines	2.5kg / 6can box 16kg / pail can

* These products are made by order. Please contact us for delivery time and quantity (lot size).



LM-190* Rust Prevention Grease

Not include solid lubricant agents

Mineral grease using special composite soap as increase consistency agent. Has superiority in rusting control property, extreme-pressure property, mechanical stability, water-resisting property, etc.

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.1,2	-	245	0.15	1. Construction machines such as booms of large cranes 2. Forklifts, farm machines, automobiles, etc.	2.5kg / 6can box 16kg / pail can

* These products are made by order. Please contact us for delivery time and quantity (lot size).



LM-191* Bio Grease

Not include solid lubricant agents

Environmental-friendly biodegradable grease composed of urea grease using synthetic oil as base oil.

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.2	-	140	0.15	1. Automobiles, motorcycles, bicycles 2. Golf carts, farm machines, outboard motors, etc.	400g cartridge / 20bottle box 2.5kg / 6can box 16kg / pail can



LM-3202,3302,3302F* White Color Grease

Not include solid lubricant agents

White color for plastic using synthetic oil as base oil.
No silicon oil is used. Available to use places near electric contacts.


NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.2	-	-	-	1. Plastic gear parts of bicycles 2. Mechanic parts of PCs, printers, etc. 3. Camera zooms and shutters, etc.	500g polycontainer / 6can box 2.5kg / 6can box 16kg / pail can

* These products are made by order. Please contact us for delivery time and quantity (lot size).


Quick Reference Matrix of Paste


Product umber	LM-32 [※]	LM-82	LM-0801	LM-83	LM-901
Product Name	NV Albina	Booster #100	Paste Spray	Booster	Aluminum Special
Type	Paste	Paste	Aerosol	Paste	Paste
Color	Grayish black	Grayish black	Grayish black	Grayish black	Silver gray
NLGI	2	2	-	1	-
OT	-35 ~ 450°C	-35 ~ 450°C	-15 ~ 200°C	-20 ~ 160°C	-60 ~ 1200°C
Withstand Pressure Load	◎	◎	○	◎	◎
Heat Resistance	◎	◎	○	△	◎
Cold Resistance	○	○	△	△	◎
Use	For heat resistance High load resistance	For assembling adjusting	For assembling adjusting	For high-class assembling adjusting	For ultra -high temperature Not available for sliding parts

● Paste

 LM-32[※] NV Albina (for heat resistance and high-load resistance)					
Composed of polyalkylene glycol mixed with MoS ₂ . Vaporizes base oil completely at 200°C and over, and becomes dry lubricant composed of MoS ₂ only.					
NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.2	17	274	0.12	1. Turbine blade embedding 2. Bolt tightening of hot parts 3. Bearings vibrating at a low speed such as regulator valves, etc.	1kg / 6can box 2.5kg / 6can box 16kg / pail can

※ These products are made by order. Please contact us for delivery time and quantity (lot size).

 LM-82 Booster #100 (for assembling adjusting)					
Paste type product mixed MoS ₂ with high-class lubricant oil in high concentration. Has good adhesion to metals and forms MoS ₂ film in a short time.					
NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
No.2	13	147	0.09	1. Bearings of worms, bevel gears with high load sliding rate 2. Burn-in and cling prevention of various joints 3. Adjusting of high-speed rotation parts and fritting corrosion prevention	1kg / 6can box

 LM-0801 Paste Spray (for assembling adjusting)					
Make a high performance LM-82 booster #100 an aerosol product mixed with MoS ₂ in high concentration for easy use .					
NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient (μ)	Major use	Package size
-	13	147	0.09	1. Adjusting of high-speed rotation parts and fritting corrosion prevention 2. Sliding surfaces of various oil seals 3. Assembling adjusting auto parts	300mℓ / 24bottle box



LM-83 Booster (for high-class assembling adjusting)

Mixed much more particle of MoS₂ with paraffin mineral oil in high concentration and added more adhesive property than LM-82. Much higher-class adjusting agent than LM-82

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient(μ)	Major use	Package size
No.1	15	245	0.08	1. Bearings of worms, bevel gears with high load sliding rate 2. Burn-in and cling prevention of various joints 3. Adjusting of high-speed rotation parts and fretting corrosion	225g tube / 10 bottle box 1kg / 6can box* 16kg / pail can*

※ These products are made by order. Please contact us for delivery time and quantity (lot size).



LM-901 Aluminum Special (for ultra-high temperature)

Excellent anti-burn-in agent with extreme heat resistance property (maximum 1,200°C) composed of aluminum mainly mixed metal powder with mineral oil.

NLGI	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient(μ)	Major use	Package size
-	-	461	-	Turbine casings, bolts of electric furnaces, nuts, washer clings, 固渋, and burn-in prevention Caution : Don' t use this product for rotary parts and sliding parts	500g / 10can box 1kg / 6can box

● Oil

Additive used for industrial oil. Oil and additive excellent in withstand load property and mixed with low friction coefficient MoS₂. Just add it to general industrial oil, you can extend service life of oil itself and prevent the machine aging, not to mention machine performance improvement.

Two types of oil are available based on usage and operating temperature limit.



LM-81 Auto リキモリ (Additive oil)

Colloid of changing MoS₂. into SAE40 mineral oil completely. Available to add to all other industrial oils , and suitable for wear prevention, aging prevention as well as extending the service life of oil.

Operating temperature limit	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient(μ)	Major use	Package size
-20 ~ 180°C	13	147	0.10	Add to cylinders, diesels, motors, compressors, turbines, machine oils, etc. Add to oils of various reduction gears and gear boxes	1ℓ / 12can box 4ℓ / 4can box



LM-120 Heat-Resistant Oil (for heat resistance)

Colloid of changing MoS₂ into paraffin naphthene mixed base oil for heat resistance.

Operating temperature limit	PV value (MPa·m/sec)	Pressure resistance load (MPa)	Friction coefficient(μ)	Major use	Package size
-10 ~ 200°C	12	127	0.10	Gear lubrication of various industrial machines and machine tools (for straight oil)	18ℓ / pail can

● Current Lube

Current Lube can be used in contact points of all electric equipments. Current Lube enables to increase electrical conductivity, give lubrication, prevent abrasion, and stabilize and improve the performance of electric equipments for a long period of use.

【 Attribute 】

1. Low electric resistance
2. Negative temperature coefficient of resistance
3. Chemical Inertness
4. Available to use for metals and non-metals
5. Wide operating temperature limit
 - S-1 (-30℃～ 130℃),
 - S-2 (-20℃～ 220℃),
 - L-6 (-45℃～ 230℃),
 - L-7 (-30℃～ 240℃),
 - L-8 (-40℃～ 160℃)
6. Available to use for long hours due to nondrying property



S series (Grease type)

Use special low electric resistant grease to realize to use it for electric contact parts.

Product Number / Product Name	OTL	Color	Major Use	Package
S - 1 Current Lube	-30 ~ 130℃	Milk white	1. Electric contact parts such as light electric rotary switches of machines and measurement equipment. 2. Automobile switches, electric contact parts of connector parts, etc. 3. Railroad crossing bars, electric contact parts of control instruments 4. All other electric contact parts of shipping and precision technologies	200 g Polycontainer / 12 can box 1kg / 6can box 16kg / pail can [※]
S - 2 Current Lube	-20 ~ 220℃	Yellow		

※ These products are made by order. Please contact us for the delivery time and quantity (lot size)



L series (Oil type)

Use special oil and control electric resistance low so as to realize to use it for electric contact parts.

Product Number / Product Name	OTL	Color	Major Use	Package
L - 6[※] Current Lube	-30 ~ 240℃	Light yellow	1. Electric contact parts such as light electric rotary switches of machines and measurement equipment. 2. Automobile switches, electric contact parts of connector parts, etc. 3. Railroad crossing bars, electric contact parts of control instruments 4. All other electric contact parts of shipping and precision technologies	200m ℓ / 12 bottle box 1 ℓ / 12can box 18 ℓ / pail can
L - 7[※] Current Lube	-40 ~ 160℃	Light yellow		

※ These products are made by order. Please contact us for the delivery time and quantity (lot size)

● Dry Coating

Dry film, a film mixed solid lubricant such as MoS_2 with organic or inorganic binder, forms a dry coating film on the pretreated materials (such as chemical conversion treatment) to increase film adhesion property and carries out lubrication action with solid lubricant in this film. Making each sliding part dry coated and using grease and oil there are very effective to further maintenance free and energy saving. In addition to dry coat processing, we can do pretreatment (phosphate treatment, black oxide finish) and sell dry coating liquid.

【 Major Use 】

1. Dry lubrication (areas where oil is disliked)
2. Areas where oil films break due to high load
3. Initial seizing and cling
4. Areas with lots of dust
5. Fretting and corrosion prevention
6. Lubrication at high temperature and under vacuum conditions

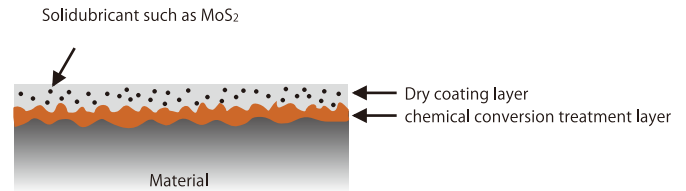


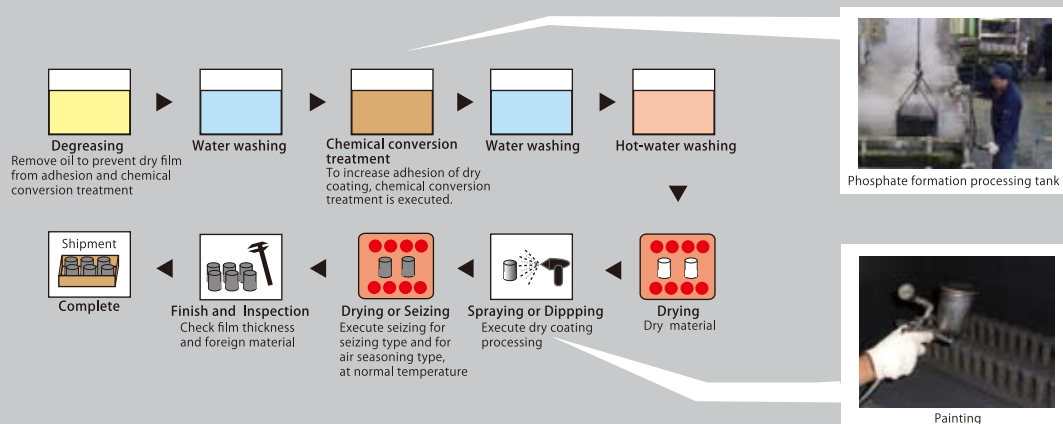
Figure : image of dry coating

Product Number Product Name	Color	PV Value	Pressure resistance load	Friction coefficient	Heat resistant temperature	Component	Package
LM-23 Concentrate	Grayish black	10	147	0.03	-60 ~ 450°C	Disperse MoS_2 to viscosity SAE #30 volatile solvent . JRS 64099-2E-15AR-1D Air seasoning type	500g (1L angular can) / 12cans
LM-26 Molynamel B	Grayish black	-	245	0.05	150°C	Disperse MoS_2 to acrylic medium. A combined solvent of 2 liquids is used as a thinner. Air-seasoning type	150g / 6 cans 1kg (1L poly container) / 4 2.5kg (3L poly container) / 6 16kg / pail can
LM-52 Molynamel C	Grayish black	20	294	0.04	200°C	Disperse MoS_2 and special lubricant agent to phenol medium. Alcohol is used as a thinner. JRS 64099-2E-15AR-1D Seizing type	1kg (1L poly container) / 4 2.5kg (3L poly container) / 6 16kg / pail can
LM-53 Molynamel D	Grayish black	21	294	0.04	260°C	Disperse MoS_2 to silicon medium. Xylol is used as a thinner. Seizing type	1kg (1L poly container) / 4 2.5kg (3L poly container) / 6 16kg / pail can
LM-55 Molynamel G	Black	20	294	0.04	200°C	Disperse MoS_2 to epoxy medium. Xylol is used as a thinner. Seizing type	1kg (1L poly container) / 4 2.5kg (3L poly container) / 6 16kg / pail can
LM-56 Molynamel Z	Grayish black	-	245	0.05	200°C	Disperse MoS_2 and PTFE to epoxy medium . Xylol and MEK are used as a thinner. Seizing type	1kg (1L poly container) / 4 2.5kg (3L poly container) / 6 16kg / pail can
LM-62 Molynamel F	Grayish black	-	294	0.03	200°C	Disperse MoS_2 and special lubricant agent to organic resin medium . A combined solvent is used as a thinner. Air-seasoning type for cold forging	1kg (1L poly container) / 4 2.5kg (3L poly container) / 6 16kg / pail can

All dry coating products including liquid concentrate and processing are made by order. Please contact us for the delivery time and quantity (lot size).

Pretreatment process

Pretreatment suited for each material of processed goods is executed.
Following diagram shows a typical process of articles



● WPC Treatment

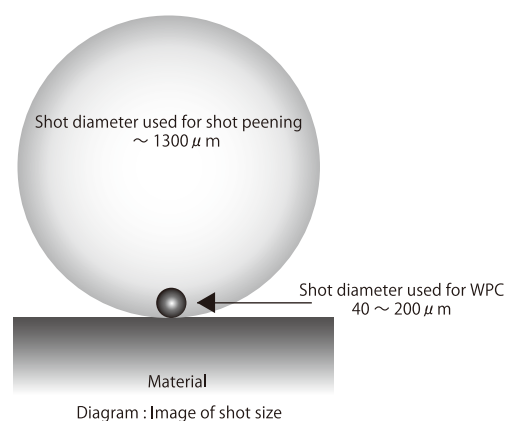
WPC is the patent (patent number:1594395) and the registered trademark of Fujikihon Corporation.

It was known that smashing plates with a hammer could improve their strength and durability. WPC treatment is the one to improve the surface of material by applying this technology.

This is a surface treatment process for the purpose of improving "fatigue strength" by spraying and hitting 40-200 μm size of shot materials to materials to be treated at high speed of 100m/sec and over. By this, some effects including improvement of sliding performance and slip resistance can be expected depending on the size of shot materials. Compared with the normal shot-peening treatment (200-1300 μm size of shot), this treatment doesn't cause roughness on the surface but forms a very delicate dimple (irregularity). And as the processing depth is shallow and shot load is small, fatigue crack and surface change by shot rarely happen. Therefore, the surface is treated shot densely.

Following are three typical roles of WPC treatment:

- ① Increase hardness of shot surface and improve its strength and wear-resistance
- ② Store residual stress on the material surface by shot and improve fatigue strength
- ③ Keep lubricant in dimples made on the surface and improve sliding performance



【Use application】

Metal component, metal processing, cutting tool and machine tool processing

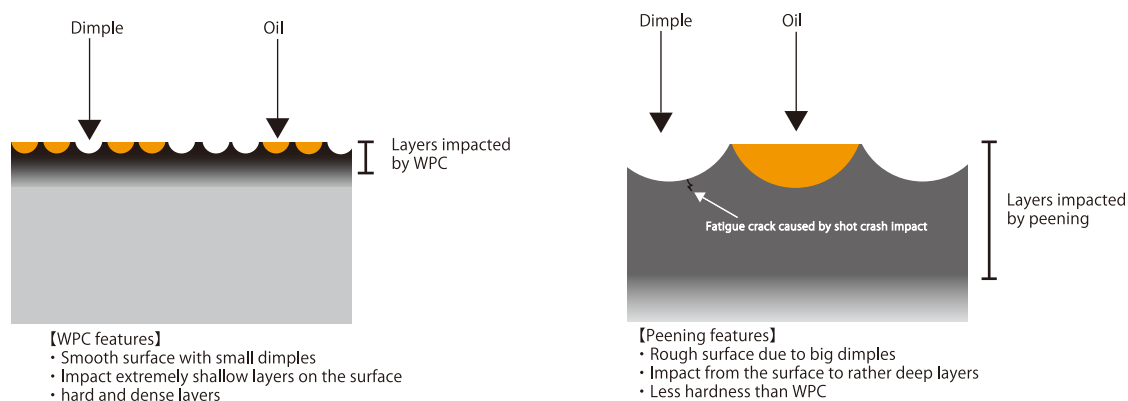


Diagram Image of showing difference between shot peening and WPC

● Other surface processing

IPVD, CVD, PTFE coating, nonviscous coating, etc. We can process and execute general surface processing with lubricity.

As all these products are made by order, please contact us for the specification and the delivery time.

● Auto Chemical Lubricant

A list of auto products

Name	PN (NLGI)	Package	Color	Features
Brake rubber grease	LM-0101 (No.2) LM-0104	60g tube x 30 / case 300m ℓ × 24 / case (aerosol)	Grayish black	Grease used for rubber and brake. Keeps air-tight of cylinder and rubber, and secures the effect of brake for a longtime by excellent resistant to heat and wear of MoS ₂ . Operating temperature limit : -20℃ ~ 220℃
High spec silicon grease	LM-0117 (No.2)	30g tube × 40 / case	White	High-adhesive type silicon grease with silicon oil as base oil containing polymer silicon powder. Available to be used in a wide variety of temperature. Operating temperature limit: -60 ~ 900℃
Clutch grease	LM-0201 (No.2)	60g tube x 30 / case	Grayish black	MoS ₂ compound. Extreme-pressure and resistance to wear grease. Operating temperature limit : -20 ~ 220℃
Disk pad grease	LM-0301 (No.2) LM-0302	30g tube × 40 / case 150m ℓ × 24 / case (aerosol)	Copper	Grease for preventing disk pad from squeaking. Operating temperature limit: -10℃ ~ 200℃
Bearing grease	LM-0401 (No.2) LM-0402 (No.2) LM-0403 (No.3) LM-0404 (No.3)	2.5kg × 6 cans / case 16kg / pail can 2.5kg × 6 cans / case 16kg / pail can	Grayish black	High load type MoS ₂ compound. Protects bearing from wear and has an effect on longer fueling interval. Operating temperature limit: -20℃ ~ 150℃
Bearing grease (Without MoS ₂)	LM-0411 (No.2) LM-0412 (No.2) LM-0413 (No.3) LM-0414 (No.3)	2.5kg × 6 cans / case 16kg / pail can 2.5kg × 6 cans / case 16kg / pail can	Light brown	Protects bearing from wear and has an effect on longer fueling interval. MP type grease without MoS ₂ compound. Operating temperature limit : -20 ~ 150℃
Constant velocity joint grease	LM-0501 (No.2) LM-0502 (No.2) LM-0503 (No.2)	150g cornice × 24 / case 2.5kg × 6 cans / case 16kg / pail can	Grayish black	Lithium grease containing MoS ₂ with excellent load bearing and resistance to wear. Operating temperature limit : -20 ~ 150℃
Constant-velocity joint grease (containing organic molybdenum)	LM-0521 (No.2) LM-0522 (No.2)	150g cornice × 24 / case 16kg / pail can	Yellow	Organic molybdenum compound. Grease with excellent resistance to heat, load and wear. Operating temperature limit : -20 ~ 180℃
Molybdenum grease #100	LM-0515 (No.2)	60g cornice × 20 / case	Grayish black	High performance grease containing MoS ₂ in high concentration with excellent load bearing and resistance to wear. Suitable for preventing constant joint from squeaking. Operating temperature limit : -20 ~ 180℃
Moly lithium grease	LM-0601 (No.2)	400g cornice × 20 / case	Grayish black	MPLithium grease containing MoS ₂ with high load bearing. Operating temperature limit : -20 ~ 150℃
Moly SM grease	LM-0602 (No.2)	400g cornice × 20 / case	Grayish black	MPLithium grease containing MoS ₂ . Operating temperature limit : -20 ~ 150℃
Moly chassis grease	LM-0603 (No.2) LM-0604 (No.1)	400g cornice × 20 / case 16kg / pail can	Grayish black	Chassis grease containing MoS ₂ with excellent water resistance. Extend the filling interval about twice. Operating temperature limit : -10 ~ 100℃
BM grease	LM-0605 (No.2) LM-0606 (No.2) LM-0607 (No.2)	400g cornice × 20 / case 2.5kg × 6 cans / case 16kg / pail can	Grayish black	Adhesive and water-resistant grease containing MoS ₂ . Suitable for outdoor-type heavy machine. Operating temperature limit
BM grease (middle adhesive type)	LM-0608 [*] (No.2)	2.5kg × 6 cans / case 16kg / pail can	Grayish black	Middle adhesive type BM grease containing MoS ₂ . Operating temperature limit : -20 ~ 180℃
BM grease (high adhesive type)	LM-0609 [*] (No.2)	2.5kg × 6 cans / case 16kg / pail can	Grayish black	High adhesive type BM grease containing MoS ₂ . Excellent in resistance to stick-slip. Operating temperature limit : -20 ~ 180℃
Chassis grease (without MoS ₂)	LM-0613 (No.2) LM-0615 (No.2) LM-0618 (No.0) LM-0623 (No.1) LM-0625 (No.1)	400g cornice × 20 / case 16kg / pail can 16kg / pail can 400g cornice × 20 / case 16kg / pail can	Light brown Dark brown	Normal chassis grease without containing MoS ₂ . Excellent in water resistance and suitable to be used for wet parts and outdoor. Operating temperature limit : -10 ~ 80℃
Lithium grease (without MoS ₂)	LM-0614 (No.2) LM-0616 (No.2)	400g cornice × 20 / case 16kg / pail can	Light brown	Normal lithium grease without containing MoS ₂ . Operating temperature limit: -20 ~ 120℃
EP grease	LM-0633	16kg / pail can	Light yellow	Normal lithium grease without MoS ₂ . EP (Extreme Pressure) grease with superior load resistance feature. Operating temperature limit : -20 ~ 120℃
Lesstorque	LM-0702 (aerosol)	420m ℓ × 24 / case	Light yellow	MP osmotic lubricant spray containing organic molybdenum.
Paste spray	LM-0801 (aerosol)	300m ℓ × 24 / case	Grayish black	A product transforming paste with MoS ₂ compound into spray. For smooth combination and wear seizing prevention.
Drycoat spray	LM-0901 (aerosol)	300m ℓ × 24 / case	Grayish black	A product transforming MoS ₂ dry coating agent into spray. Suitable for lubricating oil-avoiding areas and area and high-temperature and pressure parts.
HI POWER JET	LM-0910 (aerosol) LM-1404 (aerosol)	150m ℓ × 10 sets / case	Grayish black	MoS ₂ powder spray. Just spray this product inside the cylinders, you can realize the engine becomes powerful. Set with LM-1404 cylinder cleaner
Super spray grease	LM-1001 (aerosol)	300m ℓ × 24 cans / case	Light yellow	MP spray grease compounding organic molybdenum with lithium grease.
Power max	LM-1101 LM-1102	250m ℓ × 24 cans / case 1 ℓ angular can × 12 cans / case	Grayish black	Engine oil additive agent. Suitable for power up, fuel cost saving, overheat prevention, oil deterioration prevention and turbo engine. Operating temperature limit : -20 ~ 180℃
For differential mission gear	LM-1201 LM-1202 [*] LM-1203 [*]	150m ℓ cornice × 24 / case 500m ℓ tube × 25 / case 1 ℓ angular can × 12 cans / case	Grayish black	Additive exclusive for gear oil with MoS ₂ compound. Reduces gear squeaking, prevents seizing and oil deterioration. Operating temperature limit : -10 ~ 200℃
Coupler grease	LM-1301 (No.2) LM-1302 (No.2)	2.5kg × 6 cans / case 16kg / pail can	Grayish black	MoS ₂ compound grease. Excellent in load bearing, lubricant property and resistance to grit and dust. Operating temperature limit : -20 ~ 150℃
Brake and parts cleaner	LM-1402 (aerosol) DM-007	530m ℓ × 24 / case 850m ℓ × 24 / case	Clear and colorless	Excellent for cleaning and removing foreign matters such as grease and metal powder. Can be sprayed with the can downside up. Lightly-scented.
Aluminum special (seizing inhibitor)	LM-1501 [*] LM-1503 (aerosol)	200g container × 12 / case 150m ℓ × 24 / case (aerosol)	White silver	Seizing inhibitor mixed with aluminum metal powder excellent in heat resistance. Especially does great execution in high temperature. Operating temperature limit : -60 ~ 1200℃ Caution! the operating temperature limit of aerosol type is different from the one described above.
Tech lube (water-resistant grease)	LM-1601 (aerosol)	420m ℓ × 24 / case (aerosol)	Light yellow	Excellent in water resistance. With less splash, suitable for sliding parts including chains. This product is an easy-to-use spray type with excellent coating properties.

※ These products are made by order. Please contact us for the delivery time and quantity (lot size)

A list of auto products

Name	PN (NLGI)	Package	Color	Features
Less rust [*] (strong corrosion control agent)	LM-1701 LM-1702 [*]	300mℓ × 24 / case (aerosol) 20ℓ / angular can	Light yellow	Water displacement type corrosion prevention spray which has an outstanding effect on corrosion, salt and potassium chloride control. Available to be used when water is attached.
Boron spray	LM-1801	150mℓ × 24 / case (aerosol)	White	Powder type spray using white solid lubricant of boron nitride. Excellent in heat resistance and adhesive property. Suitable to be used in oil-avoiding areas.
Electric molybdenum grease	LM-2001 [*] (No.1)	500g × 6 / case	Grayish black	Grease exclusively used for current electric components with MoS ₂ compound. Operating temperature limit : -10 ~ 200°C
Auto grease	LM-5001 (No.0) LM-5002 (No.0)	300g tube × 24 / case 1ℓ accordion tube × 15 / case	Dark brown	Packs chassis grease with excellent water resistant property in easily-handled mayonnaise type accordion tube container. Grease for centralized oiling of large diesel-powered vehicles. Operating temperature limit : -10 ~ 80°C
Recyclean	LM-8002	16ℓ / angular can	Clear and colorless	Refill for the Brake & Parts Cleaner. By using a special purpose refilling equipment, the cleaning liquid can be repeatedly refilled. Waste cans can be reduced. Most suitable for use in factories that consume the cleaner in large amounts.

※ These products are made by order. Please contact us for the delivery time and quantity (lot size)

● リキモリ Nylon

リキモリ Nylon (Nylon with MoS₂ filled up) was developed to improve mechanical and physical characteristics of nylon as well as technological property while keeping its original electrical and chemical properties. The addition of MoS₂ makes MoS₂ as nucleus, changes into microcrystalline structure from crystal structure, increases the degree of crystallinity and then degree of heat conductivity. Following are the comparison chart between リキモリ Nylon and variety of engineering plastic properties:

Our company form, shape, cut and process MP nylon, MC nylon, polyimide polyacetal, PTFE, polyethylene, Thickness.as well as normal size リキモリ nylon.

Comparison chart between リキモリ Nylon and variety of engineering plastic properties

Property	Unit	LIQUI-MOLY Nylon	Normal nylon		Polyacetal	Super-high-molecule polyethylene	PC	Test method ASTM
			Nylon 6	Nylon 6.6				
Tensile strength	MPa	76	74	76	61 ~ 66	43	59 ~ 69	D638
Stretch	%	15	130	60	15 ~ 75	450	20 ~ 60	D638
Modulus of elongation	10 ³ MPa	2.5	2.4	2.8	2.3	0.9	2.5	D638
Compressive strength	MPa	83	82	89	110	32	74	D695
Strength in shear	MPa	74	70	89	55		63	D732
Bending strength	MPa	103	96	113	89	23	88	D790
Impact strength	(with izot notch) J/m	30	55	50	66	Non-destructive	637	D256
Hardness (Rockwell)	R-Scale	119	80	97	110 ~ 120	40 ~ 50	110 ~ 120	D785
Melting point	°C	225	225	265	165			D789
Heat deformation	°C (0.45MPa)	180	180	220	120	45	135	D648
Allowable temperature limit	°C (continuity)	120 ~ 130	110		104	120	120	—
Friction coherent (moving)	— vs. steel	0.08	0.18		0.13			—
Friction coherent (stationary)	— vs. steel	0.10	0.25		0.18			—
Specific gravity	—	1.15	1.13 ~ 1.14	1.13 ~ 1.14	1.42	0.94	1.20	D792

※ Numeric values shown in the above table are general property values, not delivery specification.

















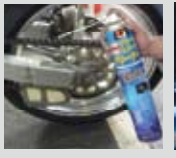




S I unit conversion 1MPa = 10.2kg/cm²、1J/m = 0.102kgf·cm/cm

リキモリ Nylon round bar and board size (standard)

Round bar	Outside diameter mm (Length : 1,000 mm)	10 [※]	15 [※]	20	25 [※]	30	35 [※]	40	45 [※]	50	60	70 [※]	80 [※]	90 [※]	100 [※]
Board	Thickness mm (Width 500 mm ×Length 1,000 mm)	5			10		15		20		30 [※]		50 [※]		

※ These products are made by order. Please contact us for the delivery time and quantity (lot size)



DM-001		<div data-bbox="359 342 1002 387"> Powerful Penetrating Lubricant NET 300ml </div> <div data-bbox="1173 347 1528 380"> Organomolybdenum Composition </div> <p>A multipurpose long-lasting lubricant excelling in sustention, lubrication and rust prevention with organomolybdenum composition. With its water displacement property, this product is effective in moisture areas.</p> <div data-bbox="347 488 1136 571"> Application <ul style="list-style-type: none"> Loosen car and motorcycle door hinges, nuts, muffler joints, etc. Lubricate and prevent rust: household article, home lectric appliance, various tools, fishing goods, etc. </div> <div data-bbox="1182 416 1541 573">   </div>
DM-002		<div data-bbox="359 598 927 642"> Long-Term Rust Prevention NET 300ml </div> <div data-bbox="1173 604 1528 638"> Organomolybdenum Composition </div> <p>A long-term rust prevention agent which is effective for salty wind, tidewater and ant freezing/meting. With its water displacement property this product is effective in moisture areas.</p> <div data-bbox="347 743 1136 828"> Application <ul style="list-style-type: none"> Easy -to-rust areas: suspensions, internal fenders, door hinges, etc. Store for long term and prevent rust: tools and farm equipment </div> <div data-bbox="1182 674 1541 831">   </div>
DM-003		<div data-bbox="359 862 686 907"> Chain Grease NET 300ml </div> <p>A chain grease excelling in water and heat resistance compared with universal lithium grease. This product will keep lubrication effect for long term with less scattering.</p> <div data-bbox="347 1003 1136 1088"> Application <ul style="list-style-type: none"> Car and motorcycle chains, car door and small warehouse hinges, etc. Fill up with grease: operating parts of machine tools and farm equipment </div> <div data-bbox="1182 938 1541 1095">   </div>
DM-005		<div data-bbox="359 1122 770 1167"> Powder Lubricant NET 220ml </div> <div data-bbox="1209 1128 1489 1162"> Boron Nitride Composition </div> <p>A special lubricant, which is gumless, resists dust and dust, excelling in permeability and drying property with boron nitride composition. Low friction coefficient and resist heat up to 900 degrees C.</p> <div data-bbox="347 1240 1136 1341"> Application <ul style="list-style-type: none"> Squeaking prevention and smooth operation: car and motorcycle pulleys, belts, key holes, shock absorbers' piston rods, shafts, etc. Household sashes, sliding doors, etc </div> <div data-bbox="1182 1187 1541 1344">   </div>
DM-006		<div data-bbox="359 1373 957 1417"> Powder Lubricant (Compact Size) NET 70ml </div> <div data-bbox="1209 1379 1489 1413"> Boron Nitride Composition </div> <p>Power Lubricant (DM-005) is available in smaller sized container. Easy to use. It can be used not only in key holes, but also door hinges and sliding rails of desks. Recommended in portions where foreign matters may accumulate, when conventional lubricant is used. When dried after application, the substance becomes powdery and prevents adherence of foreign matters.</p> <div data-bbox="347 1514 1136 1617"> Application <ul style="list-style-type: none"> Suitable for use on all key holes; door hinges; sliding rails of windows, sash doors and closets; bike and bicycle kickstands; and sliding rails of desks. Suitable for use on piston rods, shafts and belts in automobiles. Also effective in stopping the squeaking noise of automatic windows. </div> <div data-bbox="1182 1456 1541 1612">   </div>
DM-007		<div data-bbox="359 1641 880 1686"> Brake and Parts Cleaner NET 850ml </div> <p>With the combination of petroleum-based hydrocarbon and alcohol, the product has superior cleaning features. It can be used as grease, and recommended as brake fluid. Sufficiently fast-dry and easy to use. The container is designed so that it can be used downside up. The 850ml can contains ample undiluted solution (608ml).</p> <div data-bbox="347 1805 1136 1868"> Application <ul style="list-style-type: none"> Suitable for cleaning and removing grease and metal particles on the brake system and other parts. </div> <div data-bbox="1182 1718 1541 1874">   </div>
DM-008		<div data-bbox="359 1901 778 1946"> Contact Protector NET 220ml </div> <p>The uneven contact surface can be made flat by embedding grease, so as to maintain a stable contact surface and to protect the contact by preventing abrasion caused by sliding movement. This product was developed to prevent electrical contact problems. Different from conventional agents for temporary contact recovery, the effect is long lasting and contributes to stable electricity supply.</p> <div data-bbox="347 2042 1136 2145"> Application <ul style="list-style-type: none"> Suitable for contacts of battery terminals, coupler terminals, sliding switches, knife switches, electrical switches in automobiles, antennas, personal computer USBs, etc. <p>Caution: Read the user instruction before use, and strictly follow instructions on parts where application is prohibited.</p> </div> <div data-bbox="1182 1977 1541 2134">   </div>

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3. company' s future
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■ Date of foundation: May 18th, 1953

■ President: Masashi Hanamura

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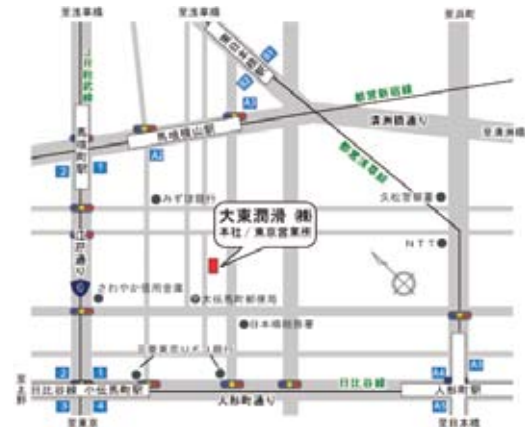
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E-mail: Osaka@liqui-moly.co.jp

■ Capital fund: 35 million yen

■ URL: <http://www.liqui-moly.co.jp>

【 Access map to Head Office 】



[Access by train]

Five minutes' walk from Bakurocho Station (JR Sobu Line)
Five minutes' walk from Bakuro Yokoyama Station (Toei Shinjuku Line)
Five minutes' walk from Higashi Nihombashi Station (Toei Asakusa Line)
Five minutes' walk from Kodanmacho Station (Tokyo Metro Hibiya Line)
Seven minutes' walk from Ningyocho Station (Tokyo Metro Hibiya Line/Toei Asakusa Line)

【 Access map to Osaka Sales Office 】



[Access by train]

Fifteen minutes' walk from Kounoikeshinden Station
(JR Gakken Toshi Line)
Eighteen minutes' walk from Kadomaminami Station
(Nagahoritsurimiryokuchi Line)

[Access by car]

In the nearest Daito Tsurumi IC, only the northbound traffic has an exit. If you drive from Suita or Ikeda on the southbound traffic, exit at Kadoma IC and go on the central loop line to Mattaomiya 2 intersection.

Obtained ISO 9001 certificate in March 2007



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