

**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.

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



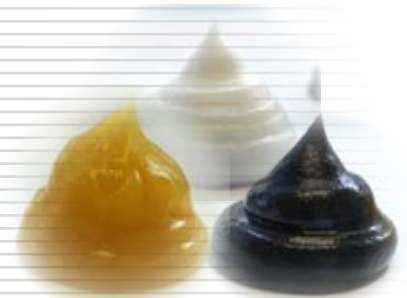
[Application example]  
 Addition to wire drawing stroke, metal mold coating and resin, addition to various grease, oils and coating agents

**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



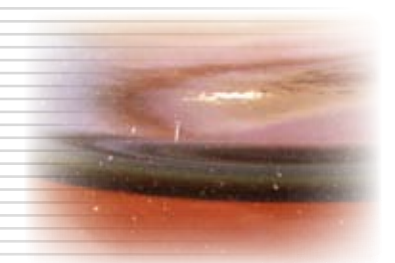
**Oil**



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.)

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

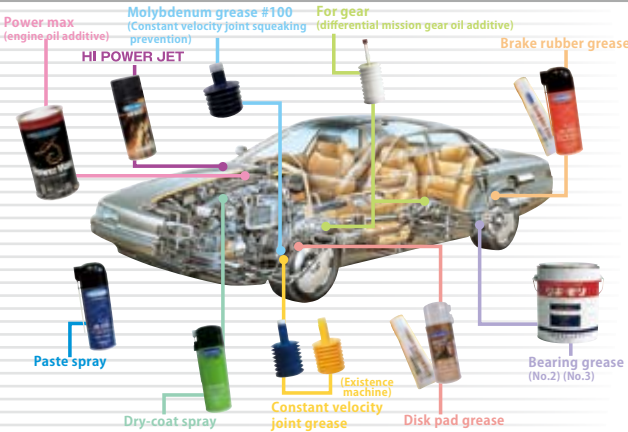
Increase surface strength dramatically

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



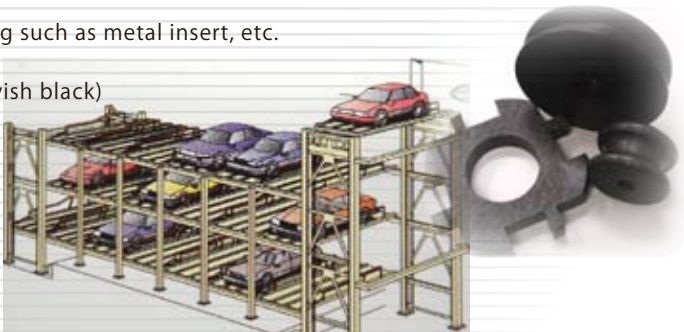
Engineering Plastic



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.