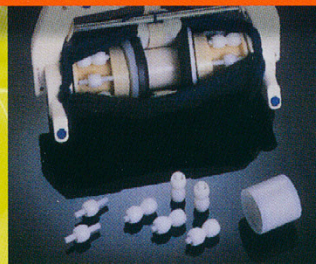
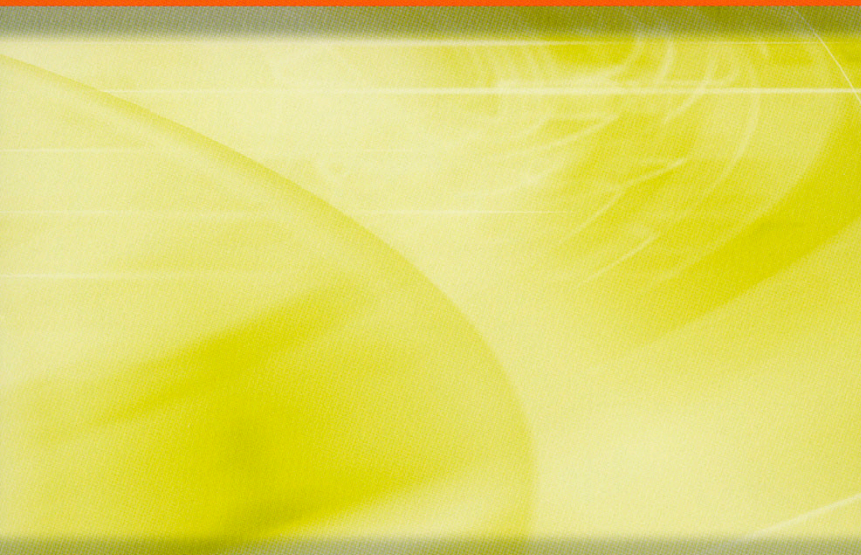


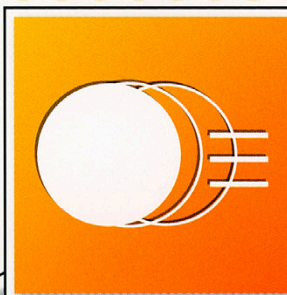
LUBMER™

LUBMER™ A Special Polyolefin Resin with Superb Sliding Properties



Get high performance in

LUBMER™ is a specialty polyethylene developed by Mitsui Chemicals' original polymerization technology. LUBMER™ has outstanding sliding properties, abrasion resistance and moldability. Especially, LUBMER™ is used for a wide range of applications for soundproofing parts of office automation equipments, automotive, electrical and electronic parts. In addition, LUBMER™ is making a significant contribution to the development of building materials, mechanical parts, etc., attracting attention as a high-performance material that will build a future.



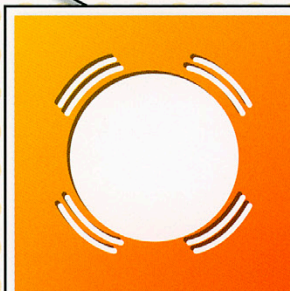
Sliding properties

Coefficient of friction comparable to that of fluoropolymers.



Food safety

Some of the LUBMER™ grades meet food hygiene requirements.



Abrasion resistance

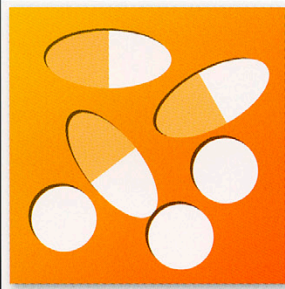
By far better than ordinary polyethylene, polyacetal and polyamide materials.

LUBMER™

the shape as you wish

Features of LUBMER™

A set of unique properties meeting needs in the right place



Chemical resistance

Stable against various chemicals.



Electrical insulating properties

Excellent electrical insulating properties comparable to those of other polyolefins.



Noiseless properties

A contribution to soundproofing gears and rollers.

LUBMER™ contributes to in a wide range of applica

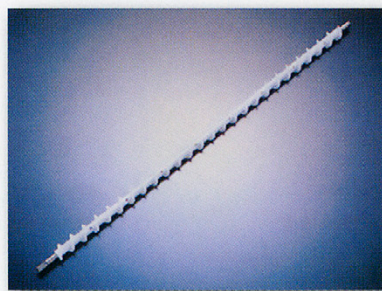
Electrical / Office Automation Equipment Parts

LUBMER™ is used widely for personal computers, copiers, etc. which are indispensable for information technology.

Applications	Required properties	Competitive materials
Facsimile rollers	Abrasion resistance to paper, non-adhesion of printing ink	POM
Facsimile paper holders	Abrasion resistance to paper, sliding properties	POM
Rollers for PPC toner transfer	Abrasion resistance to toner, non-adhesion of toner	POM
PPC toner scraper holders	Abrasion resistance to toner, non-adhesion of toner, noiseless properties	HIPS
PPC paper sorting claws	Abrasion resistance to paper, sliding properties	POM
Printing-paper-holding rollers	Abrasion resistance to paper, sliding properties	POM
Word processor key plungers	Abrasion resistance, sliding properties, noiseless properties	POM+Fluoropolymers
Noiseless gears for electric appliances	Noiseless properties, sliding properties	Rubber-containing POM Polyester elastomer PA12
Worm gears for video camera	Noiseless properties, sliding properties	Metals



Parts for Copiers, Bearings

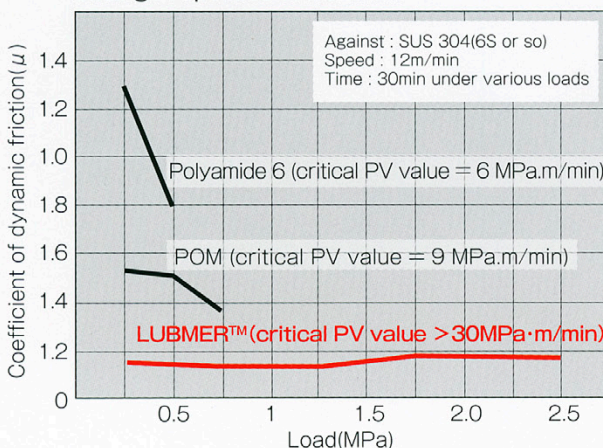


Rollers for PPC toner transfer



Keyboard plungers

Sliding Properties of LUBMER™

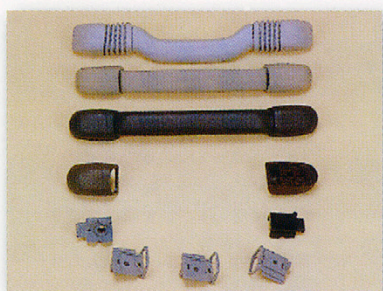


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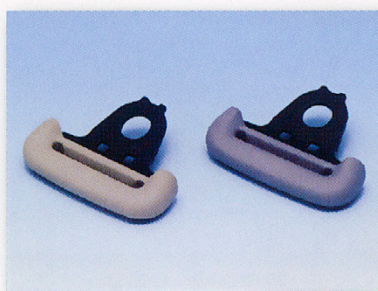
Automotive Parts

The sliding properties and abrasion resistance of LUBMER™ are utilized in many automotive parts.

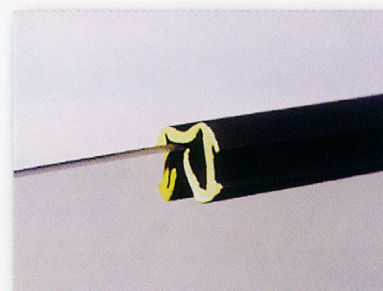
Applications	Required properties	Competitive materials
Assist traps	Abrasion resistance, sliding properties, noiseless properties	POM
Seat belts parts	Abrasion resistance, sliding properties	POM
Shock spacers for trucks	Abrasion resistance, sliding properties	Polyurethane, UHMWPE
Glass-run channel	Abrasion resistance, sliding properties	Polyurethane



Assist traps



Seat belts parts

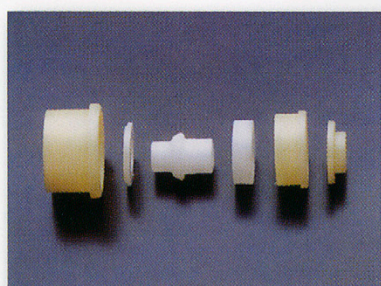


Glass-run channel

General Equipment Parts, Building Materials and Other Parts

LUBMER™ is used for products for day-to-day use to advantage.

Applications	Required properties	Competitive materials
Bearings for film-developing processors	Chemical resistance, sliding properties	Bearings
Motor bearings for vending machines	Abrasion resistance, sliding properties, hygienic quality	Fluoropolymer
Curtain-rail rings	Sliding properties, noiseless properties	PE
Rails for furniture	Sliding properties, noiseless properties	PE
Rollers for automatic massagers	Sliding properties, noiseless properties	PP+grease
Aqueduct valve parts	Chemical resistance	PC



Bearings for film-developing processors



Rollers for automatic massagers



Aqueduct parts

LUBMER™ shows unique high performance and reliability

PROPERTIES of LUBMER™ ————— A broad range of choice is available for various applications.

An Example of Injection Molding Conditions

- Molding machine : Toshiba IS-50(screw 28mmφ)
- Mold : Square plate space(120×130×2mm thick)
Gate space(5×2mm, side gate)
- No preliminary drying is required. (except for LS 4140)
Since LUBMER™ does not absorb moisture very little, there is no need for preliminary drying.

LUBMER™ is a high-molecular-weight polyethylene designed for general injection molding. For extrusion, please contact us.

Physical Properties of LUBMER™

	Property	Unit	Testing method	Testing Conditions
	Characteristics			
Basic properties	MFR	g/10min.	JIS K7210	—
	Density	kg/m ³	ASTM D1505	—
Mechanical properties	Yield stress	MPa	ASTM D638	23°C·50mm/min·Type4 dumbbell
	Tensile strength at break	MPa	ASTM D638	23°C·50mm/min·Type4 dumbbell
	Elongation at break	%	ASTM D638	23°C·50mm/min·Type4 dumbbell
	Flexural strength	MPa	ASTM D790	23°C, distance between chucks, 48mm ; 5mm/min. ; thickness,3mm
	Initial flexural modulus	MPa	ASTM D790	23°C, distance between chucks, 48mm ; 5mm/min. ; thickness,3mm
	Izod impact strength	J/m	ASTM D256	23°C, 2mm thick, notched
	Rockwell hardness	—	ASTM D785	R scale
	Kinetic coefficient of friction	—	MCI method*3	Lubmer-contact material, SUS 304 ; surface roughness, 6S
	Heat generation temp.	°C	MCI method*3	Lubmer-contact material, SUS 304 ; surface roughness, 6S
	Critical PV value	MPa·m/min	MCI method*3	Lubmer-contact material, SUS 304 ; surface roughness, 6S
	Abrasion loss	×10 ⁻¹⁰ cm ³ /kg·m	MCI method*4	Lubmer-contact material, SUS 304 ; surface roughness, 6S
Thermal properties	Vicat softening point	°C	ASTM D1525	Press. = 1kg
	Heat distortion temp.	°C	ASTM D648	0.45MPa
	Expansion coefficient	×10 ⁻⁴ cm/cm °C	ASTM D696	—
Electrical properties	Specific volume resistance	Ω·cm	ASTM D257	—
	Dielectric breakdown voltage	kV/mm	ASTM D149	—
	Dielectric constant	—	ASTM D150	23°C
	Dielectric dissipation factor	10 ⁻⁴	ASTM D150	1MHz
Others	Spiral flow	cm	MCI method	4.8-mm φ radius
	Mold shrinkage	%	MCI method	2-mm thick square sheet, MD/TD
	Water absorption	%	ASTM D570	24-hr. immersion
	Flammability	1/16"	UL94	—

The above representative value of the physical properties of LUBMER™ are not guaranteed values but standard values.

e quality

Molding conditions	Grade	L3000	L4000	L5000	LS4140
Molding temp. (°C)	C ₁	210	220	240	220
	C ₂	230	240	260	240
	C ₃	230	240	260	240
	Nozzle	230	245	265	245
Injection speed	Primary	MS	MS	HS	MS
	Secondary	LS	LS	LS	LS
Injection pressure (MPa)	Primary	160	160	160	160
	Secondary	40	40	80	50
Molding time (sec)	Injection	4	4.5	5	4
	Dwelling	10	10	10	10
	Cooling	15	15	15	15
Mold temp.		24 ~ 40°C(Water cooling)			60°C

HS : High Speed MS : Middle Speed LS : Low Speed

Basic grades			Modified grades				Other resins	
L3000	L4000	L5000	Lubricant filled	Filer filled		PA alloy	Polyacetal	Polyamide 6
			L5220	L4420	L4640	LS4140		
High moldability	←	→	High abrasion resistance	Friction improved	Heat resistance improved			
15*1	6*1	2*1	2*1	4.5*1	7*1	14*2		
969	967	966	964	1,030	1,105	1,099	1,410	1,130
—	—	—	—	—	—	60	61	78
37	41	47	45	46	47	62	—	78
20	12	10	10	7	9	150	60	>200
35	37	38	38	43	45	82	98	98
1,530	1,590	1,620	1,260	2,210	2,300	2,200	2,550	2,550
162	185	194	194	180	180	88	59	59
55	53	51	51	58	63	102	120	120
0.11	0.10	0.09	0.08	0.17	0.17	0.16	0.37	0.55
76	70	67	65	75	75	—	135	165
≥30	≥30	≥30	≥30	≥30	≥30	≥30	9	6
180	160	150	140	200	220	30	810	790
130	130	130	130	130	130	>200	162	>200
80	80	80	80	88	91	175	158	182
1.3	1.3	1.3	1.6	1.2	1.2	0.8	1.0	0.8
10 ^{17~18}	10 ^{17~18}	10 ^{17~18}	10 ^{17~18}	10 ^{17~18}	10 ^{17~18}	10 ^{15~16}	10 ¹⁴	10 ^{15~16}
44	45	44	43	60	60	25	24	20
2.4	2.3	2.4	2.4	2.5	2.5	3.2	3.7	3.4
1~2	1~2	1~2	1~2	1~2	1~2	160	70	200
42(270°C)	36(270°C)	30(270°C)	31(270°C)	34(270°C)	33(270°C)	37(245°C)	31(210°C)	40(260°C)
1.9/1.4	1.8/1.5	1.8/1.6	1.8/1.7	1.3/1.2	1.5/1.3	0.8/1.0	1.7/1.5	0.5/0.6
0.01	0.01	0.01	0.01	<0.02	0.01	1.5	0.22	1.8
HB	HB	HB	HB	HB	—	HB	—	—

*1:190°C Load 10kgf *2:230°C Load 2.16kgf *3:P=0.74MPa,V=12m/min *4:P=0.3MPa,168h



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