

What are Dry Film Lubricants?

Dry Film Lubricants are complex coatings made up of lubricating pigments in a continuous matrix of a binder. This tough coating layer provides low frictional resistance between two mating parts. The lubricating pigments fit into two main categories; crystalline lattice (lamella) type structures such as Molybdenum Disulphide, Tungsten Disulphide and Graphite or Fluorocarbons such as PTFE. These varying pigments can be combined with a wide range of resins to achieve different properties, such as: high load bearing, very low coefficient of friction, high temperature, chemical resistance, corrosion resistance, abrasion resistance.

Why are Dry Film Lubricants used?

Dry Film Lubricants can be used for a number of different reasons. They are often used when liquid lubricants (grease/oil) cannot be used. Liquid lubricants have a relatively narrow band of usable conditions. Once out of this band (due to temperature, load, wear, migration, debris) the liquid can change fluid state and no longer provide protection. In these conditions a Dry Film Lubricant will remain intact and provide continuous lubrication.

How do 'Crystalline Lattice' (MoS₂) Dry Film Lubricants work?

Molybdenum Disulphide (MoS₂) is a good example. The structure of MoS₂ can be seen in Figure 1. Although the bonds between the Molybdenum and the sulphur atoms are strong, the bonding between the crystalline lattice layers (sulphur to sulphur) are weak. This means the shear forces between the layers are very low. This shearing at the weak shear planes, provides the lubricity between sliding surfaces. This lubrication mechanism is the same for Tungsten Disulphide and Graphite.

How do PTFE coatings work?

There are three key factors that give PTFE its unique 'anti stick' properties. They all derive from its chemical structure, displayed in Figure 2. PTFE is made up of a chain of carbon atoms, with two fluorine atoms on each carbon. The first thing that is noted about the structure in Figure 2, is that the fluorine atoms are far larger than the carbon atoms, effectively shielding them. Therefore, it's almost impossible for any other chemical structure to gain access to the carbon atoms. The second and key factor is the bond strength between the carbon and the fluorine. Even if another atom or substance could gain access, the carbon-to-fluorine bonds have an extremely high bond dissociation energy (BDE) of up to 544 kJ/mol., making them almost unbreakable. The third factor is that fluorine is naturally an 'anti social' atom, which physically wants to repel other atoms. The combination of these factors gives PTFE coatings their ultra low coefficient of friction and excellent chemical resistance.

Figure 1

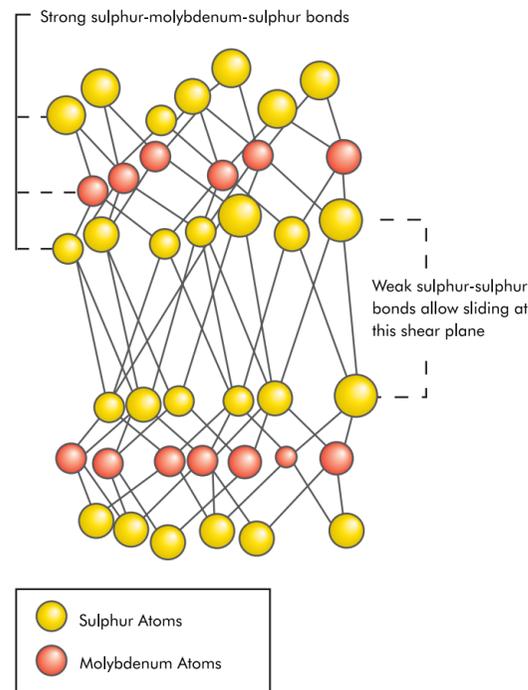
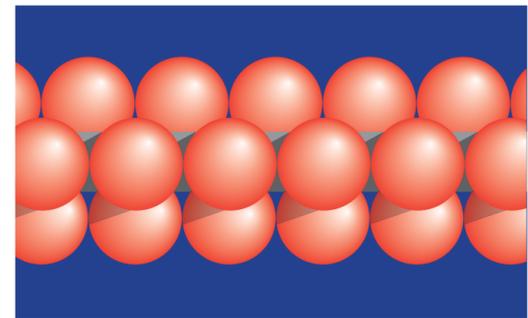
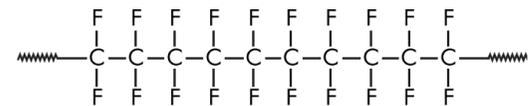


Figure 2



MARKETS

- Aerospace
- Agriculture
- Automotive
- Chemical
- Defence
- Electronics
- Food
- Marine
- Medical
- Mining/quarrying
- Motorsport
- Petrochemical
- Power Generation
- Printing
- Rail
- Telecommunications
- Textile

COATING SERVICES

- Dry film lubricants - MoS₂, PTFE, Graphite, WS₂
- Coatings for corrosion, chemical & environmental protection
- Titanium anodising
- Zinc rich coatings for corrosion protection
- Impingement coating processes for ultra thin solid film lubricants
- Nonstick/release coatings for low coefficients of friction
- Primers for rubber and plastics for sound absorbing and dampening materials
- Coatings for EMI/RFI shielding provide highly conductive coatings and platings to control electromagnetic interference
- Ultra thin conformal parylene coating to reduce friction and protect against contamination
- Pre-treatments including Ti Anodising, Phosphate Conversion Coating and Chilled Iron Blasting, Aluminum Oxide Blasting and Vapour Degreasing

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Leader in surface coatings for critical components

Coating	Solid Lubricant	Resin Type	Coefficient of Friction	Service Temperature	Dry Film Thickness (µm)	Load Capacity	Corrosion Protection ASTM B-117	Wear Life ASTM 2625, Method A	Abrasion Resistance	VOCs, Pb, Sb, Chromate, NMP	Pre-treatment GB = Grit Blast Ph = Phosphate	Application method Sp = Spray DpSn = Dip Spin Br = Brush	Cure Type	Colour/ Appearance	Specifications/ Approvals	Typical Applications	Isopropyl Alcohol or Ethyl Alcohol	Hydrochloric Acid (10%)	Mineral Spirits or Paint Thinner	Toluene	Sodium Hydroxide (10%)	Acetone	Skydrol 500	Jet Fuels (JP-4)	Distilled Water	Hydraulic Fluids	Trichloro-ethylene	Anti-Icing Fluids	Diethano-lamine	
Everlube 9005	MoS ₂	W/R Epoxy	0.04-0.06	-73°C to 204°C	7-18µm	250,000 psi	100 hrs	365	Excellent	183g/l, Pb Free, Cr Free, Sb Free	GB and or Ph	Sp/DpSn/Br	1hr 200°C	Gray/black matte		Low VOC & friction coating developed to reduce seizure on fasteners, bearings, cams, gears, splines & engine ring seals to aid assembly and running in.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
1PX1	MoS ₂	Phenolic	0.04-0.08	-73°C to 150°C	7-18µm	175,000 psi	100 hrs	200	Good	N/A, Pb Free, Cr Free, Sb Free	GB and or Ph	Sp/DpSn/Br	1hr 150°C	Gray/black matte		Low friction coating reduces galling, pick up, corrosion on rotating & sliding components where conventional lubricants are not practical e.g. flanges, valves, leadscrews, hydraulic/pneumatic bearings.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
Everlube 644	MoS ₂	Epoxy	0.04-0.08	-73°C to 200°C	7-18µm	250,000 psi	100 hrs	375	Excellent	668g/l, Pb Free, Cr Free, Sb Free	GB and or Ph	Sp/Br	1hr 200°C	Gray/black matte		MoS ₂ lead and antimony free dry-film bonded lubricant with a good chemical resistance. Typical applications:- fasteners, bearings, cams, gears, splines.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
Everlube 9002	MoS ₂	W/R Epoxy	0.04-0.08	-73°C to 200°C	7-18µm	250,000 psi	100 hrs	450	Excellent	183g/l, Pb Free, Cr Free	GB and or Ph	Sp/DpSn/Br	1hr 200°C	Gray/black matte	Mil-PRF-46010, AS5272 ty III	Low VOC dry film bonded MoS ₂ coating. Lead free lubricant with a high molecular weight resin. Good chemical, wear, friction & abrasion resistance developed for high load bearing applications.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
Ecoalube 643	MoS ₂	Epoxy	0.04-0.08	-73°C to 200°C	7-18µm	250,000 psi	100 hrs	450	Excellent	695g/l, Pb Free, Cr Free	GB and or Ph	Sp/DpSn/Br	1hr 200°C	Gray/black matte	AS5272 ty II	Low friction dry film bonded MoS ₂ coating. Lead free high load bearing lubricant with a high molecular weight resin. Good chemical, wear, friction & abrasion resistance. Ideal for threaded components.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
Everlube 620C	MoS ₂	Phenolic	0.04-0.08	-73°C to 150°C	7-18µm	250,000 psi	100 hrs	250	Good	632g/l, Pb Free	GB and or Ph	Sp/DpSn/Br	1hr 150°C	Gray/black matte	AS5272 ty II MIL-L-8937D, MIL-L-46010E Ty 1	Everlube 620C is an MoS ₂ dry-film bonded heavy duty coating. Developed for the aerospace/defence industries. Typical uses are hydraulic fittings, valve components and non-intrusive medical instruments.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass		
Everslik 1301	MoS ₂	Phenolic	0.04-0.08	-73°C to 150°C	7-18µm	250,000 psi	100 hrs	250	Good	686g/l, Pb Free	GB and or Ph	Sp/DpSn/Br	1hr 150°C	Gray/black matte		Everslik 1301 is an MoS ₂ dry-film bonded heavy duty coating. Developed for the petrochemical markets to prevent pick up, galling & seizure. Ideal for threaded components e.g. jackscrews, valve stems, ball & butterfly valves.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
PermaSlik GLF	MoS ₂	A/D Epoxy	0.04-0.08	-73°C to 120°C	7-18µm	250,000 psi	100 hrs	120	Fair	737g/l, Pb Free Cr Free	GB and or Ph	Sp/DpSn/Br	24 hrs A/D	Gray/black matte	Mil-PRF-46147	Air drying MoS ₂ coating applied from an aerosol, easy to apply and ideal for use in the field as a repair or permanent coating. Used to aid assembly on threaded components, shafts, splines & bushes, etc.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
PermaSlik RMAC	MoS ₂	Titanate	0.04-0.08	-225°C to 400°C	7-18µm	250,000 psi	N/R	160	Fair	646g/l	GB and or Ph	Sp/DpSn/Br	Air Dry 1-6 hrs 50% RH	Gray/black matte		High temperature & load bearing MoS ₂ coating. Also available in an aerosol so ideal for applying in the field. Quick drying and is used on slides, rails, threads to prevent pick up and galling.	Pass	N/R	Pass	Pass	N/R	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
PermaSlik RGAC	Graphite	Titanate	0.02-0.08	-225°C to 600°C	7-18µm	40,000 psi	N/R	N/A	Fair	702g/l	GB and or Ph	Sp/DpSn/Br	Air Dry 1-6 hrs 50% RH	Black matte		High temperature & load bearing Graphite coating. Also available in an aerosol so ideal for applying in the field. Quick drying and is used on slides, rails, threads to prevent pick up and galling.	Pass	N/R	Pass	Pass	N/R	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
Flurene 212	PTFE	Epoxy	0.02-0.08	-15°C to 150°C	10-25µm	20,000 psi	N/R	N/A	Good	15.4g/l, Pb Free, Cr Free, Sb Free	GB and or Ph	Sp/DpSn/Br	40mins 80°C (or air cure)	Blue/black matte/any		PTFE coating based on lubricating solids dispersed in a water dilutable resin binder. It is designed to offer low friction and dry lubrication and is particularly suited to application on rubber and other non-metallic substrates due to its excellent flexibility.	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
LubeLok 2006	MoS ₂ / Graphite	Silicone	0.02-0.08	-100°C to 400°C	7-18µm	100,000 psi	N/R	60	Fair	702g/l	GB	Sp/DpSn/Br	1hr 260°C	Gray/black matte		Graphite/MoS ₂ solid film bonded lubricant with a silicone resin system. The coating was designed to provide lubrication at higher temperatures, it has an extremely low coefficient of friction & good chemical resistance.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
FormKote T-50	Graphite	Silicone	0.02-0.08	-55°C to 800°C	7-18µm	40,000 psi	N/R	N/A	Fair	N/A	GB	Sp/DpSn/Br	1hr 260°C	Gray/black matte		Mould release for die casting of titanium, aluminium and zinc for temperature exceeding 800°C. It can also be used in tube bending and extruding. The coating is available in aerosols, quarts, gallons & pails.	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R		
Everlube 6102G	PTFE/MoS ₂	Phenolic	0.02-0.08	-73°C to 150°C	7-18µm	40,000 psi	600 hrs	N/A	Good	680g/l	GB and or Ph	Sp/DpSn/Br	1hr 150°C	Semi-Gloss Black		PTFE/MoS ₂ solid film lubricant. It enhances torque/tension and is applied to small springs, slides and fasteners for the automotive and domestic markets.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
Flurene 611	PTFE	PAI	0.02-0.08	-250°C to 250°C	7-25µm	20,000 psi	100 hrs	N/A	Excellent	709g/l	GB and or Ph	Sp/DpSn	1hr 200°C	Semi-Gloss Black		Resin based fluoropolymer coating giving a combination of low friction and wear resistance. Will operate in temperature from -250°C to +250°C and is suitable for many industrial applications e.g. saw blades, secateurs and bearings.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
Everlube 6108	PTFE	Phenolic	0.02-0.08	-73°C to 150°C	7-25µm	20,000 psi	1000 hrs	N/A	Good	689g/l	GB and or Ph	Sp/DpSn/Br	1hr 150°C	Semi-Gloss Black		PTFE based thermally cured solid film lubricant with a phenolic binder system. It has good anti-corrosive properties, good abrasion & chemical resistance. Developed for fasteners in the automotive industries for use on fasteners, seat slides and rails.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
Flurene 177	PTFE	PVDF	0.02-0.08	-15°C to 200°C	20-25µm	20,000 psi	100 hrs	N/A	Excellent	553g/l	GB and or Ph	Sp	30mins 270°C	Semi-Gloss Black		Flurene 177 is a unique fluoropolymer coating that offers low friction combined with superb chemical and abrasion resistance. The coating is both flexible and formable and offers outstanding wear resistance properties.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
Everslik 1201	None	Epoxy	N/A	-73°C to 200°C	7-50µm	N/A	2000 hrs	N/A	Excellent	580g/l	GB and or Ph	Sp	1hr 200°C	High-Gloss Black		Epoxy base thermally cured barrier coating which can be used as a base coat e.g. Everslik 1301. It has inherent hydrophobic properties and has good chemical and water resistance. Used extensively in the petrochemical industries on subsea and top side components.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	