



## Dry Film Lubricants & Coatings

### What is a dry film lubricant?

The most commonly known dry film lubricants are Molybdenum disulfide (MoS<sub>2</sub> or Moly), PTFE, and Graphite however there are many others.

Essentially a bonded dry film lubricant is simply a dry lubricant dispersed in a binder and/or attached to a surface by an adhesive material, this is carried for application purposes in a solvent or carrier fluid which evaporates after application.

Bonded dry film lubricants can be thought of as high performance, paint-like coatings consisting of fine particles of dry lubricants blended with a binder and special additives. After application and curing, these lubricants bond to the substrate and form a solid film. The film reduces friction and increases wear life.

Dry film lubricants contain special materials that reduce friction and wear by preventing surface-to-surface contact between mating parts. Their performances vary depending on the specific lubricant used. Some offer excellent lubrication and corrosion protection, while others operate at high temperatures or under high loads.

Some are formulated for use in extreme environments and can withstand chemicals & radiation. Molybdenum disulphide for example can be compared to a 'pack of cards', the pack when put under load can withstand high loads towards the surface, however the cards can slide over each other or 'shear' to allow movement easily.

Dry films generally provide a thin film (10—100 microns) of resin binder with suitable additives

such as molydisulfide, PTFE, or graphite. They provide a tough, durable boundary of solid film lubricant. They have low shear strengths, low coefficients of friction (typically .02—.08), and can withstand very high loads.

For application spraying, dipping, or tumbling of the components in the material is used. Some can also be thermally cured to enhance the bonding of the coating. The type of Substrate material, surface chemistry, texture, form, and mechanical properties of the base material also effects the performance of the film.

Specific coatings have been developed with surface preparations and pre-treatments for most materials including: rubbers & elastomers, plastics, glass, wood, leather, zinc, steel, titanium, chromium, aluminium, nickel, copper, brass, stainless and other metals.



Dry Film coatings are widely used for one or a combination of the following reasons:

- Components are operated in corrosive atmospheres
- Components may be stored for long periods of time
- Permanent lubrication is desired (such as inaccessible parts)
- Operating pressures exceed the load bearing capabilities of oils and greases
- Parts are subject to frequent disassembly
- Where clean operation is desired (Dry Films will not collect dust, dirt and debris like greases and oils)
- Where a protective coating or sacrificial break-in lubricant is needed (piston skirts)
- Where fretting and galling is a problem (such as splines, UV Joints etc...)
- Where easy release is desired (such as fasteners and plastic moulding operations)