

Fluoropolymers

Technical Data Sheet



What is a Fluoropolymer?

A fluoropolymer is a compound with multiple strong carbon-fluorine bonds. It has high resistance to solvents, acids, and alkalis. One of the more well-known types of fluoropolymers is polytetrafluoroethylene (PTFE). This material has a coefficient of friction of 0.05 to 0.10, which is extremely low, only aluminium magnesium boride and diamond like carbon have lower coefficients of friction.

High-performance fluoropolymer coatings are low-friction, dry-lubricant materials that achieve remarkable synergy by combining the capabilities of two types of engineering plastics. Fluoropolymers, combined with high-temperature organic polymers, polyester and epoxies to provide unique and highly versatile combinations of properties.

These tough lubricating coatings can operate successfully at extreme temperatures which, at the low end, would render ordinary fluid lubricants too high in viscosity, and at high temperatures make them susceptible to thermal degradation.

Dry Film Lubricants

The Anochrome Group mainly uses Xylan® industrial products produced by PPG.

As these applications have grown and become more focused, Xylan coatings have been adjusted to meet specific demands of a large number of different applications, and application techniques, and as a result, Xylan became the largest, complete line of fluoropolymer coatings in the world.

Among the many properties that these coatings offer are: (depending upon grade selected.)

1. Low coefficient of friction: as low as 0.02.
2. Excellent mould release properties.
3. Wear and abrasion resistance: even under extreme pressures.
4. Corrosion and chemical resistance: in most environments
5. Weather resistance: against salt water, road chemicals, acid rain
6. Wide operating temperature range: from -250°C to +285°C.
7. Flexible curing schedule: ambient to 440°C.
8. Ultraviolet (uv) light stability: some formulations have superb resistance to uv.
9. Flexibility: bending freely and frequently without breaking
10. Machinability: possibility to apply multiple coats (most formulations) and mill to desired dimensions.
11. Excellent adhesion to most metals and plastics.

These coatings can be supplied (depending upon grade) in a variety of colours including whites, creams and oranges containing other dry film lubricants and additives such as molybdenum disulphide. Manufacturers of fluoropolymers as well as PPG include Acheson, Colloids, Atotech, Dow Corning and many others depending upon end use requirements. In fact, the range of coating and additive suppliers enables almost any requirements to be satisfied.



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Application

The total performance range achievable with these coatings, coupled with the ease of processing and application, makes the choice of a fluoropolymer coating ideal for many applications.

They can be applied by dipping and spinning off excess material, and by spraying either manually or using automated equipment.

Typical applications are:

- Machine screws
- Self tappers
- Thread-forming screws
- Door hinge pins
- Clutch brakes
- Pedal assemblies
- Automotive disc-brake calipers drums and pistons
- Suspension units
- Clips and bracketing on domestic appliances
- Splines for lubricative coatings
- Roll cages
- Chemical plant
- Petroleum refineries
- Medical equipment

Xylan® and other fluoropolymer coatings can be applied either directly on to cleaned steel, over a phosphate or on to anodising, electroplated un-passivated zinc and electroplated un-passivated zinc nickel and most zinc flake paints such as Geomet® and Delta®

The standard bulk processed Xylan® used within the Anochrome Group is Xylan 5230 which has a torque-tension relationship which conforms to ISO 4042 Pt. II and a large number of automotive specifications. Other Xylan products can also be applied.

Note 1: Tightness may be experienced with small threaded fasteners; M5 and below. This need not necessarily inhibit assembly,

Note 2: Corrosion resistance (Neutral salt spray EN ISO 9227, ASTM B117) is dependent on the application method and material used but 240 hours for Xylan 5230 is attainable.



Recessed Components & Fasteners

The Anochrome Group has specialist equipment and can offer coatings for fasteners with Torx® and hexagon socket drive features as well as other small components which have complex shapes. Low levels of infill can be achieved dependent upon part geometry and basket loadings. Fasteners ranging from M3 to M20 and up to 80mm in length can be coated in bulk, larger components must be spray painted.

When recess fill does occur, prevalence can be variable according to the type of recess and the coating material. Posidrive recesses are affected more by infill than most other assembly features, since a small amount of infill reduces the driver penetration and causes failure at low torques. Other types of recess are not so sensitive and some parts that visibly show recess fill can, nevertheless, be driven satisfactorily.

The Anochrome Group operates five Sidasa plants, these specialist pieces of equipment are of a unique design minimising recess infill by the use of planetary motion baskets. Lines are available in the West Midlands, Czechia and Poland.

Xylan Relative Performance

Type	Typical Uses	Low friction	Abrasion Resist	Corrosion Resist
5230	Self-tappers	3	3	7
1070	Subsea	8	4	6
1424	Colour range	8	4	8
1010	General Low-friction	10	4	5

10 = good, 1 = low

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