



## What is a Fluoropolymer ?

A fluoropolymer is a fluorocarbon based polymer with multiple strong carbon-fluorine bonds. It is characterised by a high resistance to solvents, acids, and bases, and contains PTFE one of the more well known types of Fluoropolymer. This material has a coefficient of friction of 0.05 to 0.10, which is the third-lowest of any known solid material (BAM being the first, with a coefficient of friction of 0.02; diamond-like carbon being second-lowest at 0.05). In addition, PTFE's resistance to Van der Waals forces means that it is the only known surface to which, allegedly, a gecko cannot stick.

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, which are 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 lead to thermal degradation.

## Dry Film Lubricants

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

As these applications have grown and become more focused, Xylan coatings have been adjusted to meet the specific demands of each application process, and as a result, Xylan became the largest, most

complete line of fluoropolymer coatings in the world.

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

1. Low friction: a CoF as low as 0.02.
2. Outstanding release.
3. Wear/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. UV stability: some formulations have superb resistance to ultraviolet light.
9. flexibility: bending freely and frequently without breaking
10. Machinability: apply multiple coats (most formulations) and mill to specification.
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 and suppliers of these materials include Emralon®, Molykote® and Molydag®, E-Cote Polyseal® and many others depending upon end use requirements. In fact, the range of coating and additives allows lubricity to be matched to needs.



**Anochrome Group**

**Anochrome Technologies Ltd**  
Commercial Rd, Bloxwich, Walsall, West Midlands WS2 7NQ  
tel: 01922 404604 fax: 01922 497159  
sales@anotec.co.uk  
www.anochrome.co.uk

**WEP Ltd**  
Wood Lane, Fordhouses, Wolverhampton WV10 8HN  
tel: 01902 397333 fax: 01902 785372  
enquiries@anochrome-group.co.uk  
www.anochrome.co.uk



## Application

The total performance package 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 centrifuging off excess material, and by spraying either by hand or robot.

Typical applications are:

- Machine screws
- Self tappers
- Thread-forming screws
- Door hinge pins
- Automotive clutch-brake

- 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 application

Xylan® and other Fluoropolymer coatings can be applied directly on to cleaned steel, over a phosphate or anodised pre-treatment, and used as a top coat over electro zinc and zinc nickel (both un-passivated), 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 Ford specifications SZ600A and WZ100, WZ101 and BS 7371 Pt. II. Other Xylan products giving different properties can be used by arrangement. Typical specifications are: Ford WSD M21 P10 (S303, S306, S407) General Motors GM 6001M, GM 6003M, GME 00255ABS 7371 Pt. 10

Note1: Tightness may be experienced with small threaded fasteners having fine threads, e.g. below M5. This need not necessarily inhibit assembly,

Note 2: nss performance will depend upon substrate, pre-treatment and application method, a typical value of 240 to 480hrs unbroken film is not unreasonable.

Remember Low friction or non stick - there is a difference.

Information presented in this data sheet is considered reliable, but conditions and methods of use, which are beyond our control, may modify results. Before these product are used, the user should confirm their suitability.

We cannot accept liability for any loss, injury or damage which may result from its use.

We do not warrant the accuracy or completeness of any such information whether orally or in writing.

We reserve the right at anytime and without notice to update or improve products and processes and our information concerning the same.

## Recessed Components & Fasteners



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 the part geometry and basket loadings etc. The equipment covers the diameter range M3 to M20 up to 80mm in length. Please note that production validation must be conducted for every part.

When recess fill does occur, its effect can be variable according to the type of recess and the material. Pozidrive recesses are affected more by infill than other forms of recess, as a small amount of excess material reduces the driver penetration and causes drive failure at low torques. Other types of recess (torx, hexagon or slotted) are not so sensitive and some parts that visibly show recess fill can be driven satisfactorily.

The Anochrome Group operates two Sidasa plants, these specialist pieces of equipment are of unique design to minimise recess infill by the use of planetary motion baskets. The full systems installed in WEP in the UK and Anocote in the Czech Republic provide a positive solution to this age old problem.

### Xylan Relative Performance

Type	Typical Uses	Low friction	Abrasion Resist	Corrosion Resist
5420 (water based)	Self tappers	3	3	8
5230 (solvent based)	Self tappers	3	3	7
1070	Subsea	8	4	6
1424	Colour range	8	4	8
1010	General Low friction	10	4	5
1052	Pistons - high pressure	6	4	4

10 = good, 1 = low



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