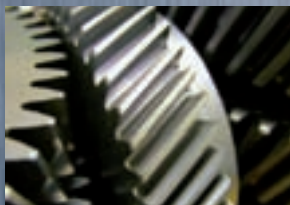




METERCOAT

new wearless
anti-friction
self-lubricating
coating system



METERCOAT

While developing advanced lubrication techniques that would satisfy the NASA requirements about space applications, a new kind of lubricant was born: the METERCOAT coating system.

This coating binds itself to the surface it is applied on and can be used for all kind of applications, thanks to the lowest dry-friction coefficient available on the market.

METERCOAT works with a process at environment temperature. Thanks to very high speed, its molecules are embedded in the surface to be covered. In order to guarantee a perfect molecular anchorage, the surface of the part to be treated must be worked until its atomic structure is completely free from oxides and dust. The tungsten disulphide covering layer (WS₂) therefore becomes part of the supporting material and can only be removed by grinding the substrate itself.

The METERCOAT layer increases sliding effect on all supporting materials, even if for other reasons they have previously been treated with different covering materials, as for instance chrome, chemical nickel, PVD, CVD, Amcoloy, Armoloy, copper-beryllium, aluminium, titanium, and so on.

The METERCOAT coating treatment can be used for many industrial applications. It is the right solution for simple and for complex situations as well. Just to make an example, parts treated with the METERCOAT system can be found on every American airplane, in order to increase their lifetime, safety and functionality.

Moreover, METERCOAT played a "pole position" role as five out the first six fastest race cars at Indianapolis had engine and gearbox components covered with METERCOAT layers.

QThe METERCOAT lubricating technique has been further modified and improved to be used in the plastic moulding industry. It allows to obtain faster, safer moulding processes with less waste material, longer maintenance intervals and, last but not least, increased gains.



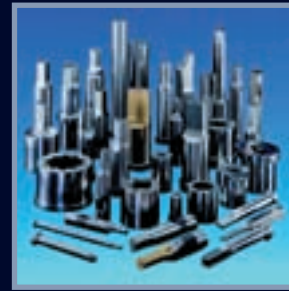
Medical and mechanical applications

METERCOAT is employed in the medical field to improve friction movements between not lubricated metals. It can be used on valves of artificial respiration appliances, catheter wires, surgical instruments and automated systems for medical products assembling in white chambers. METERCOAT has been NAMSA Class 6 tested and certified as bio-compatible. There are also examples of application in the mechanical power transmission field, as METERCOAT can be applied on assembled ball-bearing systems, allowing use of guide elements at extreme temperatures or even under vacuum conditions. The whole METERCOAT process is carried out in compliance with DOD-L-85645 Typ 1 military specifications.



Aeronautic and aerospace applications

METERCOAT has been used for years in several air and space missions. Friction problems have been reduced on airplanes, helicopters, satellites and space stations, while functioning safety has been increased.



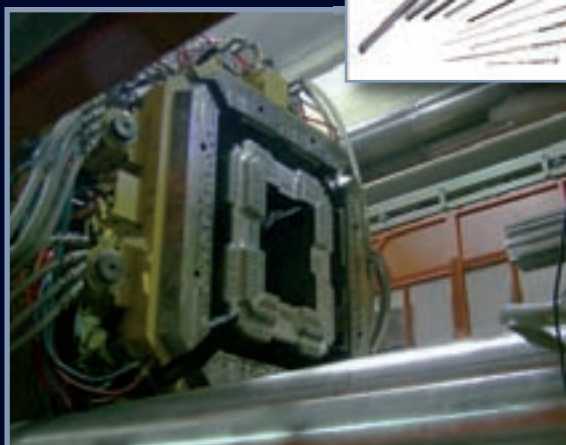
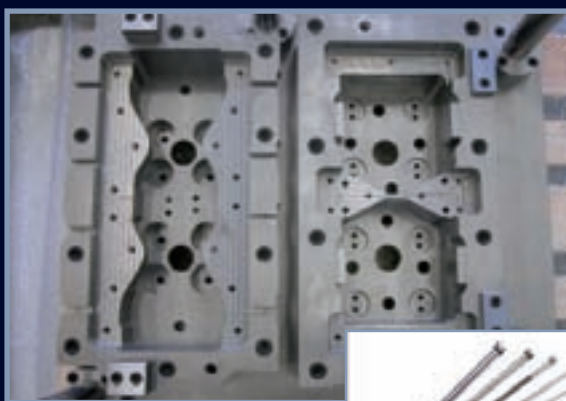
Vacuum apparatus applications

All frictioning systems that must work under vacuum conditions can be improved by employing the METERCOAT system, thanks to an uncontaminated lower friction coefficient.



Precision mechanical applications

Regarding technical application of fine mechanical constructions (with poor or even missing lubrication), METERCOAT allows low-friction transmission of forces and guides, avoids wearing, reduces friction overheat and minimises the necessary employment forces. In most cases the Stick-Slip effect can be avoided, even on friction critical materials as vanadium, titanium and aluminium. Cold welding and jamming tendencies can be avoided as well.



Moulding process performances

The METERCOAT coating process allows an easier filling up of injection moulds cavities at lower temperatures, with less pressure and easier & advanced part ejection after solidification.

This means **reduction of moulding cycle** and of stress deformation during ejection process, obtaining better quality. METERCOAT helps solving production problems with standard thermoplastic materials as PP, PE, PC and with more complicated ones as well.

With METERCOAT a 0,5µm thick protective layer (with passive structure) is applied between mould surface and injected thermoplastic material, reducing sliding friction. This is very important to obtain a perfect part ejection. In case of components with very thin walls or undercut ones, ejection is visibly smoother and faster

The advantages in using METERCOAT in the moulding process are:

- permanent lubrication to make ejection easier;
- possibility to avoid releasing agents;
- possibility to avoid ejection-helping systems;
- lower surface friction in filling operation;
- reduction of deformations (quota dissemination);
- sharp edges can be maintained;
- no surface modification;
- increased maintenance interval;
- no migration in moulded parts.

New self-lubricating guide bush

METERCOAT

This precision product is covered in METERCOAT, a thin self-lubricating layer made up by tungsten sulphide (WS₂), which decreases friction up to 70% and has very good sliding properties that allow perfect functioning without any need of lubrication. Thanks to its exceptional lubricating and sliding features.

The METERCOAT coating system is employed in the metal sheet and plastic moulding field for deep-drawing operations and as a complement of PVD layers as well.

Lifetime of PVD covered punches and die-bottoms increases by using the METERCOAT system.

At the same time, the production cycle becomes faster, while its lubricating and sliding features almost completely eliminate consumption of lubricating oils.

Moving guide and sliding systems of dies, as for instance sliding plates, guide bushes, pillars, slides, carts, ejecting devices and generally all devices that work with radial and axial movements become almost wearless and do not need any maintenance anymore if treated with METERCOAT coating system. The METERCOAT coating features undoubtedly represent a huge advantage if compared to traditional bronze / aluminium plates and bushings with graphite inserts currently available on the market.

In fact, these traditional systems tend to wear after a very short time, preventing constant moulding precision unless frequent maintenance operation are regularly carried out..

Our company Mandelli Normalizzati has recently installed a system to carry out the METERCOAT coating in their own premises located in Robassomero, Turin.

This allows us to offer all kinds of our steel and electro-galvanic bronze inserted Lamina bushings covered with METERCOAT coating.

It is therefore the first time that normalized die parts treated with METERCOAT system are immediately available from stock. Our steel and Lamina bushings are already well known for their exceptional lasting and sliding features.

By applying the METERCOAT coating on them we obtained almost wearless, long-lasting and maintenance free guide bushes that can be offered at extremely cheap price and very fast delivery times.

The availability of the METERCOAT system applying machine in our plant allows us to treat any kind of component, i.e. pillars, sliding plates, punches & die bottoms, ejector pins, slides, carts, ball-bearings and any other mechanical parts that must be turned into wearless and maintenance free components.



Technical features

The METERCOAT coating is a soft thin layer made up by tungsten sulphide that is applied at environment temperature. It does not cause any deformation or variation to the structure of the treated surface.

Its application does not need any binding substance or chemical additive, as the METERCOAT coating generates a molecular union. The 0,0005 mm thick METERCOAT coating layer uniformly covers all blue / grey surfaces and can have different aspects, depending on the features of the part to be coated.

The METERCOAT coating can be used at temperatures ranging from -273 C° to about +400 C° [and for a short time even up to +650 C°]. The METERCOAT coating is chemically neutral, it is corrosion resistant and not toxic.

The METERCOAT coating has obtained in the USA the Security Clearance to be used in the food and pharmaceutical industry.

Please note that though the METERCOAT coating is corrosion resistant, it cannot prevent the substrate which it is applied on from corrosion.

The METERCOAT coating is successfully employed with any kind of lubricant, forming with them an hydro-dynamic layer that can last for quite a long time.

When a METERCOAT treated part is assembled on a die or it is used for the first time, in order to obtain perfect functioning and long lasting lifetime it is very important to apply a very thin lubricant layer on the part itself.

The METERCOAT coating has been successfully used for a long time in many other industrial fields, as for instance: mechanical, transmission, ball-bearing, hydraulic, electro-mechanical, cutting tools, space, aeronautic, automotive automation and robotic industry.

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