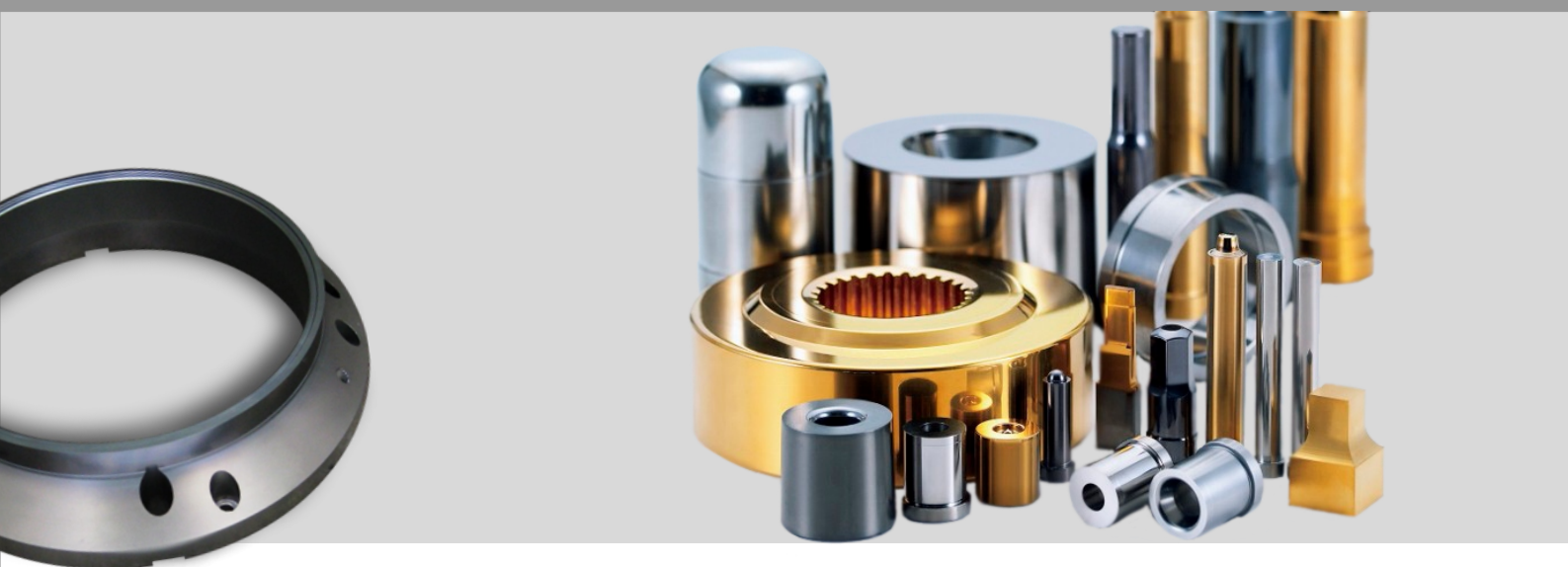


FUNCTIONAL COATINGS

RESISTANCE . HARDNESS . DEMOULDING



PVD - Physical Vapor Deposition

PVD is a thin film coating process with a high adherence applied through a vacuum deposition process of highly ionised plasma in a PVD machine, applied to the most metals, ceramics and ABS plastic surfaces.

Functional PVD allows to improve the surfaces' finish, increase their resistance and prolong their life cycle, avoiding waste and consequent faults.

WS2 - Modified Tungsten Disulfide

Applied by a jet of compressed air, is a dry film lubricant which adheres on a molecular level to any kind of metallic substrate and most kinds of polymers with a thickness of at least 0,5 μm . WS2 supports bearing loads up to 70 kg/mm² (or bearing load capacity equal to the substrate's), operates in the temperature range between -273°C and 650°C.

FUNCTIONAL PVD

RESISTANCE AND HARDNESS

PVD

Physical Vapor
Deposition

Functional PVD reduce the article's grip, allowing higher cadence and less time the equipment spends stopped. functional coating solutions allows to reduce wear and tear and corrosion, improve demoulding and facilitate the cleaning process. Is six times harder than steel and possible to apply on steel, stainless steel, aluminum, brass, zamak, ceramic and ABS plastic substrates.

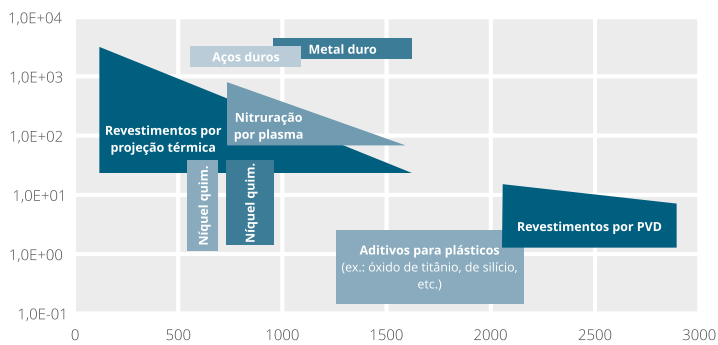
	PRITECH TiN	PRITECH CrN	PRITECH TiCN	PRITECH ZrN	PRITECH AlTiN
COATING	Titanium Nitride	Chromium Nitride	Titanium Carbonitride	Zirconium Nitride	Aluminium Titanium Nitride
HV HARDNESS	2500±400	2100±300	2800±300	2500±300	4000±500
OXIDATION TEMP. °C	500±50 °C	700±50 °C	400±50 °C	450±50 °C	800±50
ROUGHNESS	0.2 µm	0.2 µm	0.15 µm	0.2 µm	0.15 µm
COEF. FRICTION (dry)	0.65 - 0.70	0.50 - 0.60	0.45 - 0.60	0.65 - 0.70	0.40 - 0.55
THICKNESS	2 - 4 µm	2 - 6+ µm	2 - 5 µm	2 - 3 µm	2 - 3 µm
COLOR	Gold	Silver-Grey	Bluish-grey	Zirconium	Anthracite
ADVANTAGES	<ul style="list-style-type: none">· Dense micro structure· Reduce tendency to cold welding· Corrosion resistance· Biocompatible· Chemically stable· Low reative potencial surface	<ul style="list-style-type: none">· Low coefficient of friction· Plastic release agent· Good tenacity and ductibility· Abrasive wear resistance· Biocompatible· Corrosion and oxidation resistance	<ul style="list-style-type: none">· Low coefficient of friction· Good tenacity· Improve abrasive wear resistance	<ul style="list-style-type: none">· Decrease the accumulation in cutting edges· Homogeneous structure· Chemically resistance· Regular surface	<ul style="list-style-type: none">· Superior oxidation resistance and hardness at high temperature· Low thermal conductivity· Good ductibility· Smooth surface finish
IN COMMON	High hardness; increase wear resistance; Increases the quality and productivity of the articles, High adhesion to surface; Improve oxidation resistance; Reduces production costs				
APPLICATIONS	<ul style="list-style-type: none">· Machining of ferrous metals: Cutting tools, rough and finishing mills, Drills, Hard metal bits;· Metal forming: punches and dies· Plastic moulds· Surgical instruments and implants· Wear components	<ul style="list-style-type: none">· Metal shaping: medium and heavy gauges, rings and inlaying dies, shaping rolls, punches, stamping tools;· Hot stamping;· Injection moulds for metals dies for aluminium· Plastic moulds.	<ul style="list-style-type: none">· Materials difficult to machine· Highly abrasive or adhesive materials· Ductile cast iron· Copper, brass and stainless steel alloys· Intermittent cut· High speed and finishing cutting	<ul style="list-style-type: none">· Cutting wood tools with high grade nickel alloys· Aluminium alloys with <13% Si, titanium, waspalloy and resins reinforced with glass fiber· Protection of moulding surfacces against abrasion and chemical attack of resins	<ul style="list-style-type: none">· Materials difficult to machine· Hard materials,· High alloy carbon steels, cast iron, titanium alloys and stainless steels· Dry cut or components where the lubrication is reduced· High speed and high temperature cutting tools;· Moulds for metals



In terms of cutting tools it takes place a significant increase in durability and resistance to punctures and matrices.

Even in the area of plastic and rubber mouldings and mouldings for injection casting of non-iron metals (aluminium and zamak), this type of coating allows to reduce wear and tear and corrosion, improve demoulding and facilitate the cleaning process.

Different hardness Materials and Coatings Comparison



Random arc technology used by us in our PVD coating process results in a superior ionization and allows the deposition of functional coatings at temperatures as low as 200°C. However, for better coating adhesion, standard deposition cycles are carried out at 450°C.

Therefore, it is extremely important that the parts to be coated have been previously tempered at 450°C minimum in order to avoid deformation and/or loss of hardness.

The higher the deposition temperature, the greater the thickness of the coating and greater compression of the film giving it a higher hardness.

LIMITATIONS

- Requires steels with higher tempering at 450 ° C
- Maximum dimension: ø800mm x 850mm

Hot Work Steels (Die casting / Extrusion / Die forging)	
Material N°	DIN
1.2343	X 38 CrMoV 5 I
1.2344	X 40 CrMoV 5 I
1.2367	X 38 CrMoV 5 3
1.2711	54 NiCrMoV 6
1.2714	56 NiCrMoV 7
Cold Work Steels (Cutting and Drawing tools / Moulds for plastics)	
Material N°	DIN
1.2080	X 210 Cr 12
1.2083	X 42 Cr 13
1.2311	40 CrMnMo 7
1.2312	X 38 CrMoS 8 6
1.2343	X 40 CrMoV 5 I
1.2344	X 38 CrMoV 5 3
1.2367	X 155 CrVMo 12 I
1.2379	X 220 CrVMo 13 4
1.2380	54 NiCrMoV 6
1.2711	56 Ni CrMoV 7
1.2714	40 CrMnNiMo 8 6 4
1.2738	



MICROCOAT MA1000

WS2

LUBRICATION AND DEMOULDING

WS2

Modified Tungsten
Disulfide

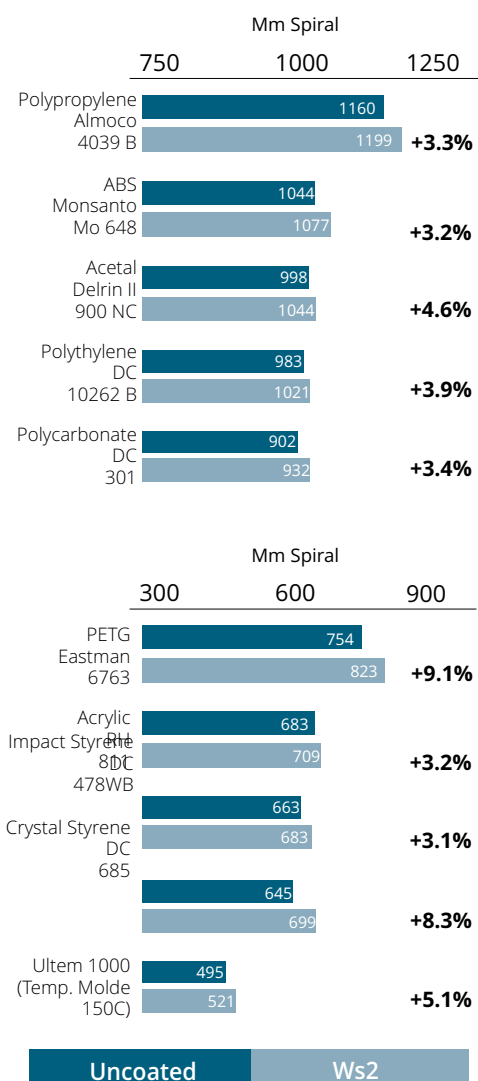
Surface modification which is a solid lubrication developed for NASA in the final stage of the Mariner missions as a lubricant capable of facing the extreme conditions of outer space.

Ws2 is also successfully used as a permanent release agent in plastic injection moulds.

TECHNICAL DATA

Composition	Modified Tungsten Disulfide (WS2) in lamellar form
Hardness	Same as the substrate - doesn't increase the hardness
Molecular Weight	248.02
Density	7.4 gr/cm ³
Thickness	0,5 µm
Appearance	Silver-grey/rhodium
Coefficient of Friction	Dynamic - 0.030; Static - 0.070
Driver	High velocity refrigerated air without binders or adhesives
Adhesion	Mechanical-molecular interlock
Cure Time	No cure time required, applied at ambient temperature
Temperature Range	Lubricates from -273°C to 650°C in normal atmosphere
Chemical Stability	Inert, non-toxic, corrosion resistant
Corrosion Resistance	Minor delay of corrosion, will not prevent corrosion of substrate
Magnetism	Non magnetic
Vacuum Environment	From -188°C to + 1316°C in vacuum of 10-14 Torr
Substrates	All ferrous or non-ferrous metals, glass, porcelain and many plastics Accepts most paints, all platings and is compatible with solvents, fuels and oils

Spiral Test WS2 with 3 to 9% Flow Increase



Tungstenite is the chemical designation of the compound of tungsten disulphide. It has an appearance of a very fine black powder. Its properties allow meet the extreme demands of missions in space.

Possible in a wide range of applications within the plastics, foundry, textile and food processing where the bonding and adhesion are a problem and lubricating fluids are not tolerated.



ADVANTAGES

- 100% lubrication throughout its texture
- Solve problems such as friction, excessive wear and mechanical lubrication
- Improves performance and increases uptime service parts
- Allows to increase the hourly production capability of components
- Eliminates or reduces maintenance problems and breakdowns
- Maintains the substrate's integrity up to 0,5 μm without creating over-thicknesses
- Supports bearing loads up to 70 kg/mm² (or bearing load capacity equal to the substrate's)
- Resists the accumulation of carbon due to its extremely low coefficient of friction which is less than half the graphite and Teflon Moly
- Compatible (and potentiates the action) of all oils and lubricants
- Reduces the weight of the piece - making it less compact
- Reducing the pressure and mold wear
- Slits and holes applications to 1.5mm
- Can only be removed by removing the adherent substrate



Ws2 not require any thermal curing, not contaminate molded parts, not change the surface finish and not grow on edges and roughness.

APPLICATIONS

- Molds and dies
- Stamping tools
- Bearings, spheres and rolls
- Tools, shafts and valves
- Engines and transmission elements
- Vibrators and pneumatic motors
- Connectors and electric motors
- Breakers and switches
- Chucks, collets and cutting tools
- Compressors and dimmers
- Industrial gears and bearings.
- Mechanisms slide
- timers
- valves
- Chain Saws
- Rubber gaskets and seals
- magnetic heads
- Rollers closure Cans
- Small arms fire
- Parts for satellites and aircraft
- High vacuum applications
- Cryogenic pumps



METALLIC

PVD + WS2

An innovative technological process for the treatment of surface coatings through co-deposition of a highly ionised layer of PVD and an intermetallic lubricant with an extremely low friction coefficient (WS2).

CHARACTERIZATION

METALLIC	MATERIAL DEPOSITED
2000	Chromium Nitride (CrN)
3000	Titanium Nitride (TiN)
3001	Titanium Carbonitride (TiCN)
3002	Aluminium Titanium Nitride (AlTiN)
4000	Zirconium Nitride (ZrN)

REQUIREMENTS

- The polishing should be done towards the sliding plate
- The base material should have sufficient hardness to not suffer deformation
- The coating should be done after finishing / final polishing of parts



TECHNICAL DATA

- Friction coefficient between 0.035 e 0.065
- Thickness between 3 a 5 μm
- Highest hardness up to 2500 HV
- Better adhesion than other coatings due to lower film tensions
- Temperature of use up to 650 °C
- Abrasion resistance
- High ductility and surface finish
- Finish that reproduces the substrate to 10 μm
- Release agent
- Better protection against corrosion than chrome and nickel
- Increases the service life of parts by over 10 times

ADVANTAGES

- Does not change the surface finish of the articles
- Improve the performance of cutting and enlaying tools
- High tenacity
- Resistance to fussion
- Reduces surface friction through lubrication
- Higher resistance to micro fissures
- In plastics injection moulding protects the cavity surface against wear caused by highly abrasive fillers and additives and chemical attack of some resins