

 **Kolzer** PVD2.0[®]



PVD (Physical Vapor Deposition) coating is an innovative technology used to apply thin films to various materials, offering improved properties such as hardness, wear resistance, corrosion resistance and aesthetic improvements. PVD 2.0[®] coating represents a technologically advanced solution with significant benefits in terms of environmental sustainability and in harmony with recent regulatory adjustments on manufacturing processes.

In particular, PVD 2.0[®] eliminates the use of toxic materials, residues from processing and has virtually zero environmental impact. Its characteristics of energy efficiency, waste reduction and improved product durability combine to produce an environmentally friendly alternative for a wide range of industrial applications.

MK34" THE BEATING HEART OF THE NEW PVD 2.0®

PVD 2.0® technology allows for extremely dense and homogeneous decorative and/or technical coatings with reduced production times.

It permits maximum technical and aesthetic performance with sustainable technology and extremely low production costs.

Quality, over 70 years of production experience and 24/7 service make Kolzer® your ideal partner.



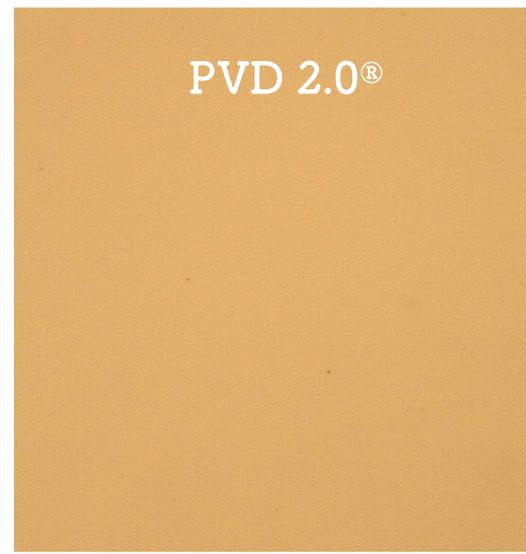
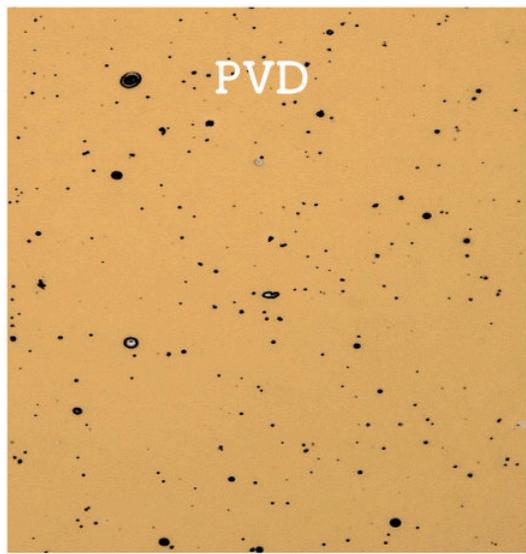


WHAT IS PVD 2.0®

PVD 2.0® technology presented by KOLZER® reconfirms the characteristics of traditional PVD and adds new, important and durable performances in the mechanical and chemical application, compatible with almost any material with or without pre-treatment.

PVD 2.0® consists in a sputtering process whereby the material to be deposited is energized using a high-power magnetron and reacting with process gas to obtain a dense, compact and extremely resistant coating.

The final treatment has perfect adhesion as a result of surface preparation with the help of an ultra-efficient Plasma.





PVD 2.0[®]: THE NEW ERA IS HERE

 COMPATIBLE SUBSTRATES	Metal, glass, plastic, ceramic.
 TEMPERATURE	Low temperature, reduced stress on the substructure.
 STRUCTURE	Dense and compact coating through high-energy ionization.
 UNIFORMITY	Perfect penetration and uniformity including cavities.
 MECHANICAL RESISTANCE	High quality through reduced surface friction and density structure.
 CHEMICAL RESISTANCE	Extremely durable, due to the solid structure with incorporated macroparticles.
 CYCLE TIMES	> 30 minutes.
 IMPRONTABILITY	Easy to clean.
 COLORING	A wide range of metallic colors with repeatability is selectable by using pure metal or metal alloy sources in combination with gas mixes.
 PRODUCTION REJECTS	Minimal: no droplets/optimal uniformity and penetration.



The MK34" is available in three load capacity variants, designed to suit different requirements.

The smallest, ideal for small objects, limited productions or precious metal deposits. The mid-size variant, perfect for standard PVD productions on 3D objects. Finally, the largest version that can reach up to 1500 mm in useful coating height, suitable for large sizes and large productions.

MK34" is the ideal machine that guarantees reliability and efficiency in all conditions of use.

TYPES OF COATING

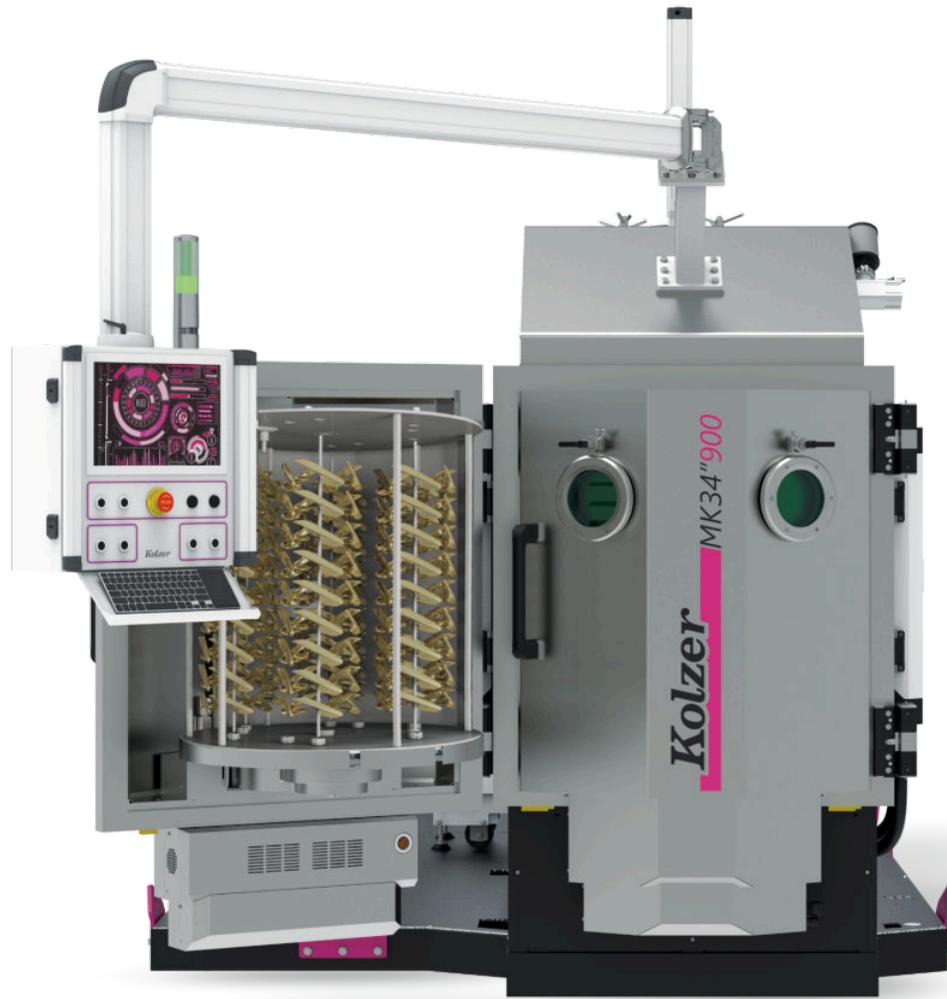
The new MK34" offers the possibility to easily perform a wide range of decorative and technical metal coatings, with very high repeatability from pure metals, alloys and combined reagents.

An inclusive technology compatible with almost all materials: Plastic, Metal, Glass, Ceramic and no distinction of shape, geometry and size.

The following Coating Technologies can be successfully implemented: PVD 2.0, Anti Finger-print, PECVD, Magnetron Sputtering, HiPIMS, Thermal Evaporation.

TECHNICAL SPECIFICATIONS

- Double door for optimized production
- Multiple loading positions
- Modular configuration
- Short cycle times
- Open and intuitive software
- Online technical support
- Extensive process and color database
- Fast color change
- Low energy consumption



MK 900

Chamber	Stainless steel
Volume	ø 865 x height 900 mm
Loading doors	2
Plasma	Etching
Coating	PVD 2.0®
Coating Useful Area	ø 800 mm x height 600 mm

Easy to use and small size: maximum productivity with just one operator. The Kolzer MK 900® machine guarantees easy start-up, precision and versatility at the touch of a button: the compact coating chamber is ideal for small objects, limited production runs or precious metal deposits. The dual loading system can simplify the loading/unloading of the machine.

 **Kolzer**

MK34"

Extreme automation for high-volume requirements: the ideal machine for your productivity chain.

Due to the optimization of processes and the two doors arranged for simultaneous loading and unloading of parts, the Kolzer MK 1400® series machine guarantees high speed throughput and multiple work outputs, also ideal for integration with the manufacturing systems of larger industrial facilities.

MK 1400

Chamber	Stainless steel
Volume	ø 865 x height 1400 mm
Loading doors	2
Plasma	Etching
Coating	PVD 2.0®
Coating Useful Area	ø 800 mm x height 1100 mm



Maximum productivity for PVD Coating on large volumes.

KOLZER's latest development, the engineering department has resulted in the creation of this machine with reduced production space but extremely productive with a larger loading capacity up to 1500mm. It can generate PVD 2.0[®] coatings while maintaining flexibility and efficiency with cost-effective results.



MK1800

Chamber	Stainless steel
Volume	ø 865 x height 1800 mm
Loading doors	2
Plasma	Etching
Coating	PVD 2.0 [®]
Coating Useful Area	ø 800 mm x height 1500 mm



	NAME	COLOUR	PROPERTIES	APPLICATION	HARDNESS	TYPICAL THK μm	COEFF. OF FRICTION
	Titanium nitride	Gold shades, from light to yellow gold	Very high hardness, toughness, and wear resistance. Low coefficient of friction. Good corrosion resistance. Biocompatibility.	<ul style="list-style-type: none"> • Cutting, punching and forming tools. • Injection moulding components. • Medical devices and surgical tools. • Aerospace and automotive components. 	2000-3400 HV	0.5-5	0.4-0.6
	Zirconium nitride	From nickel to light gold and brass	Excellent elastic modulus, hardness, and toughness. High thermal stability, corrosion and wear resistance. Biocompatibility.	<ul style="list-style-type: none"> • Cutting, punching and forming tools. • Biomedical components. 	2500-2900 HV	0.5-5	0.5
	Titanium carbonitride	From bronze to grey	High hardness. Good abrasive wear, corrosion, and chemical resistance. Biocompatibility.	<ul style="list-style-type: none"> • Cutting, punching, forming, bending, and embossing tools. • Stamping applications. 	2700-3500 HV	0.5-5	0.2-0.3
	Zirconium carbonitride	From light bronze to grey	High hardness and toughness. Excellent abrasive wear and corrosion resistance. Low friction coefficient. Biocompatibility.	<ul style="list-style-type: none"> • Cutting, stamping, and forming tools. • Biomedical devices. 	2500-3600 HV	0.5-5	0.3-0.5
	Chromium nitride	From light to dark grey	High hardness. Good toughness. High corrosion, wear, abrasion, and oxidation resistance. Low friction coefficient.	<ul style="list-style-type: none"> • Cutting tools. • Engine parts. • Mold and forming dies. • Sliding and rotating components. 	1400-2500 HV	0.5-5	0.3-0.4
	Chromium carbonitride	From dark grey to black	High toughness and hardness. Excellent chemical resistance. High corrosion and abrasive wear resistance. Low friction coefficient.	<ul style="list-style-type: none"> • Tools for drawing, pressing, bending and stamping of copper and other non-ferrous materials • Tools for metal forming of abrasive materials. • Plastic moulding application to improve mould release. 	2000-2700 HV	0.5-5	0.2-0.35
	Diamond-Like Carbon	From graphite to black	High hardness. Low friction coefficient. Excellent chemical stability, oxidation, and wear resistance Biocompatibility.	<ul style="list-style-type: none"> • Industrial and automotive components (e.g. pistons, gears, mechanical seals) • Injection moulding components (e.g. dies, ejection pins, sliding machine parts) • Durable consumer goods (e.g. wristwatches, jewellery, golf clubs) 	1500-3200 HV	0.5-4	0.1-0.2
	Metal-doped amorphous carbon with hydrogen	Various shades of grey	Good hardness. High chemical stability, oxidation and wear resistance. Low coefficient of friction.	<ul style="list-style-type: none"> • Industrial and automotive components (e.g. pistons, gears, mechanical seals) • Injection moulding components (e.g. dies, ejection pins, sliding machine parts) • Durable consumer goods (e.g. wristwatches, jewellery, golf clubs) 	8000-1500 HV	0.5-4	0.2



MK34" PVD 2.0[®] CONFIGURATIONS

MK34" can be customised in three distinct configurations, which are distinguished by the type of coating required.



ULTRA DECO • LUXURY

This machine configuration is dedicated to speed and aesthetic performance.

For fashion and luxury accessories, a specific preparation of the technical part of the process has been specially designed to obtain unlimited colours.

This version offers considerable production speeds while preserving the excellent technical properties of the coating, emphasising lower energy consumption, fast colour change and excellent aesthetic and mechanical performance on steel, brass, zamak, aluminium, die-cast alloys, plastics, glass and 3D printed.



ULTRA WEAR • TECHNICAL

The unique Ultra Wear system produces coatings with a dense and homogenous microstructure, morphologically free of defects with perfect adhesion to surfaces. The result is a finish that significantly exceeds the quality of classic sputtering and arc coatings.

It is particularly suitable where maximum performance is to be obtained from a PVD, offering coatings with mechanical wear characteristics (tools and technical components) and electronic characteristics (fuel cells, electronic devices).



ULTRA POWER • DESIGN

The PVD 2.0[®] machine from Kolzer meets the demands and coating requirements in a wide range of coloured coatings, providing a decorative-functional finishing on die-cast, galvanised and steel metal materials, with a unique ability to withstand mechanical and chemical stresses, while maintaining long-term colour with low imprintability.



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ATTENTION TO THE CUSTOMER

The Kolzer® team follows the client step by step, from installation to acceptance tests, from the training of employees to the use of the machines, up to after-sales assistance, on site or remotely 24/7. The customer focus also continues with the supply of spare parts and consumables. Kolzer® MK34" the ideal machine for those who want high performance in small production spaces.

