



VACUUM PLASMA PECVD
Systems

Range MK®

Range DGK®



PLASMA

Plasma is a clean, dry process, performed at room temperature, that does not require any cleaning products nor solvents (no consumable materials).

It is a treatment that allows the removal of surface material forming volatile products.

It can be used for the micro-cleaning of surfaces contaminated by organic compounds.

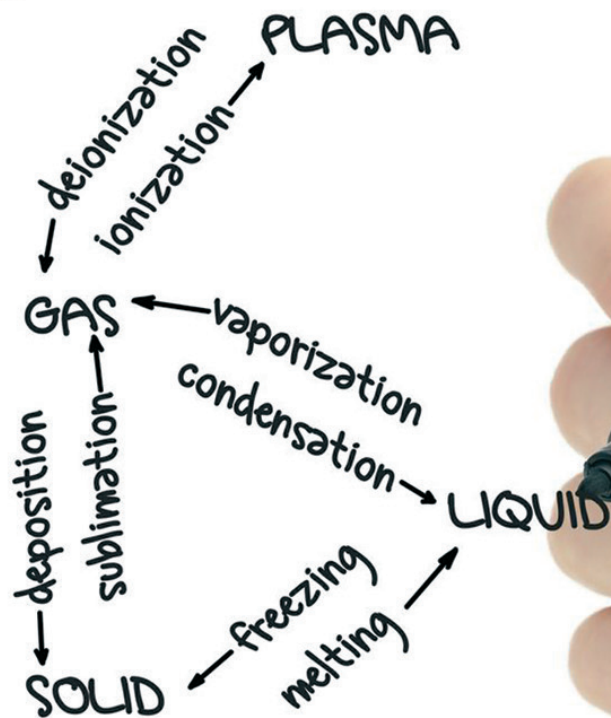
Changing the nature of the process gas and blending, makes it possible to achieve different surface characteristics.

- It removes organic contaminants or residue layers
- It improves surface tension, and therefore wettability of the surfaces, reducing the angle with regard to liquids at optimal values
- It sterilizes
- It cleans any surface (of any nature, geometry and dimension) and modifies its chemical and electrostatic characteristics.

The plants designed and manufactured by Kolzer are suitable also for plasma treatment in order to achieve a surface chemical modification prior to varnishing, gluing, bonding, coating and decoration.

■ **Successful production concept**

■ **1000 plants sold worldwide**



PECVD

PECVD is a transparent coating with a barrier effect.

The growth of thin films onto a surface can be efficiently done through chemical reactions in vapor phase [Chemical Vapor Deposition, CVD] of components containing the element to be deposited.

■ **24/7 after-sales assistance**

■ **Treatment is environmentally friendly**

Changing the process parameters, the precursors and the shape of the reactor, the PECVD technique makes it possible to deposit numerous materials.

Plasma-grafting allows the modification of superficial chemical characteristics of polymers, within specific chemical groups.

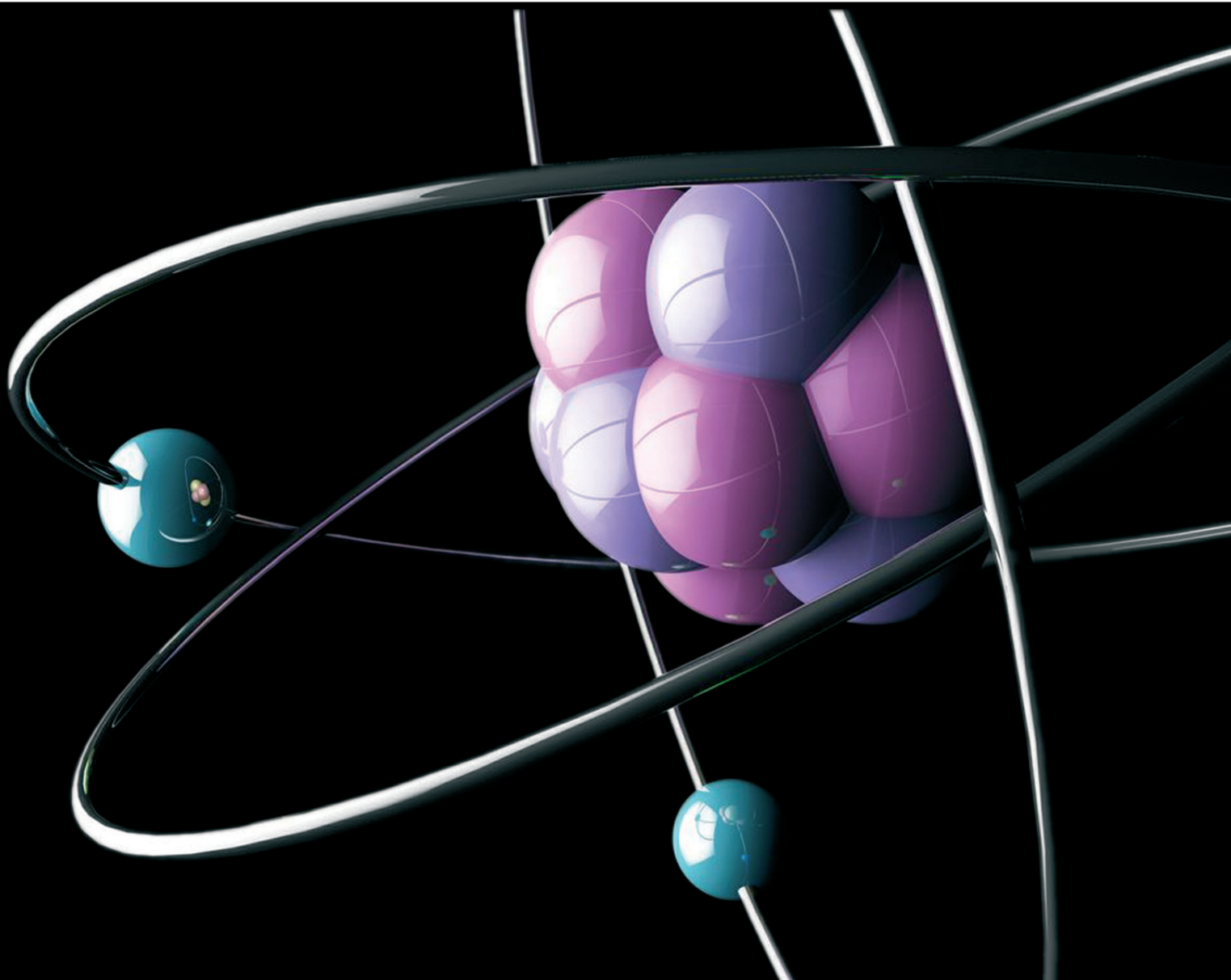
Exposing natural and synthetic polymers to specific plasmas, makes it possible to obtain surfaces chemically different from the original ones.

The result is a new product, with the

same mechanical and physical characteristics, but with different possibilities in interacting with surrounding matter.

This treatment is usually applied in order to improve adhesiveness and wettability properties of polymers allowing the transformation of a surface, from water-repellent to hydrophilic.

Vice versa the use of fluorine based gases transform the surface in a Teflon-like material, therefore having remarkable characteristics of hydrophobicity and oil repellency.



Coating characteristics:

FILM FLEXIBILITY

STRONG ADHESION WITH THE SUBSTRATE

RESISTANCE TO IMPACTS

PROTECTION AGAINST CORROSION

GAS BARRIER

ANTI-SCRATCHING AND ANTI-WEARING

WATER REPELLENCY

TRANSPARENCY

With PECVD technology you can achieve similar benefits on all surfaces, metals, alloys, polymer and plastics, wood, glass....

Research carried out by our technicians, the constant cooperation with our customers and the most important laboratories worldwide, allowed us to tune dedicated processes for a wide range of fields of application, for example: characteristics of surface hardness with low wearing coefficient, grafting, anti-corrosion in acid and alkaline environments, water repellency, oil repellency, fireproofing, scratch-resistant, non-sticking, anti-printing and bio-compatibility, anti-stain effect and decrease of water vapor (anti-fog properties), etc.

TEST	PROTOCOL	RESULT
Salt spray	ASTM B117/97	> 1200h
Chemical resistance	ASTM D 4652	yes
Resistance to solvents	ASTM D 4652	yes
Boiling water	internal methodology	it resists
Heating resistance	internal methodology	> 400°C
UV-visible light exposure	ASTM G 53	it resists without yellowing
Impact	ASTM 2794	it resists
Bending	ASTM D 522	180° ("T")
Adhesion	ASTM D 3359	it resists
Composition	bait	$\text{Si}_x\text{O}_y\text{C}_z\text{H}_w$
Thickness	various	0.1 - 5 μm

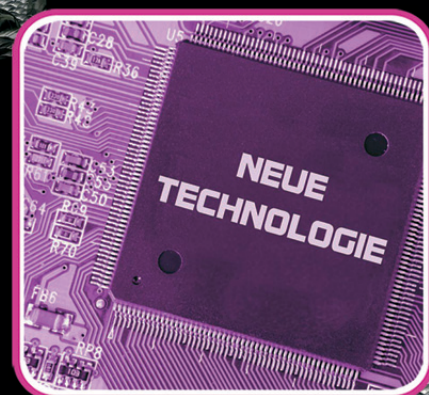
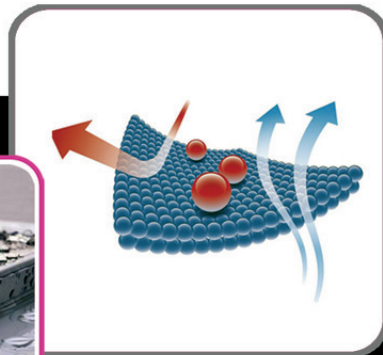
- The main equipment parts are as follows:
- process chamber
 - vacuum pumping group
 - electrical power supply system and control of gas flow
 - electrical power supply system, control and generation of plasma
 - PC and software control to ensure repeatability of the process
 - safety and self-diagnosis system

The process chamber contains the Plasma sources (stainless steel bars, aluminum or titanium) powered by radio-frequency, mid frequency or direct current.

The chamber is internally lined with stainless steel protection shields.

It is equipped with portholes for visual checking of the process and it's thoroughly tested with a helium mass spectrometer to guarantee its perfect sealing and air tightness overtime.

Kolzer was the first company developing and marketing solutions based on nano film deposition using Plasma technology.



NANO TECHNOLOGY

THE PLANTS

KOLZER's plant engineering technology stands out because it adapts its concepts to individual client requirements. In addition, Kolzer offers qualified engineering for complex production systems. The range of supplies includes plant families, from the "Mini compact plant" for research companies and laboratories, to bigger and more complex coating systems and special plants for in-line processes and large sized articles.

Cube range 3D™

ONIRIO 2,4 lt. width 120 x depth 200 x h 100 mm

ATHENA 40 lt. width 350 x depth 450 x h 250 mm

LOTUS 490 lt. width 700 x depth 700 x h 1000 mm



Horizontal range DGK®

The most complete range of process chambers in order of size:

DGK24" diameter 610 mm

DGK36" diameter 1000 mm

DGK48" diameter 1200 mm

DGK63" diameter 1600 mm

DGK100" diameter 2500 mm

Comes with two loading systems with carriage to facilitate loading and unloading. The sizes of the plants listed can be "personalized" in accordance to production needs.



Vertical range MK®

This family plant range:

MK34" diameter 900 mm

MK48" diameter 1250 mm

MK63" diameter 1600 mm

MK72" diameter 1800 mm



All the plants have automatic process control, temperature detection, pressure and gas flow regulation, as well as different substrate supports, including patented rapid loading systems.

Supplied on request: cold/hot water feeding, cleaning plants and instruments for quality control, for example, Kalo-Tester, Rockwell-Tester, microscope with image elaboration.

Contact our headquarters, our technicians will be at your disposal at anytime for all the information you may require.

TECHNICAL CHARACTERISTICS

		Horizontal				Vertical	
PLASMA SYSTEMS		DGK24	DGK36	DGK48	DGK63	MK48	MK63
Chamber diameter	mm.	610	1000	1200	1600	1250	1600
Chamber lenght	mm.	1000	1250	1400	2200	1250	1250
Plasma sources		STANDARD					
PECVD sources		STANDARD					
Substrate heating		OPTION					
Emptyng time 5×10^{-4} mbar	min.	2	4	4	4	4	4
Maximum vacuum	mbar	1×10^{-5}	1×10^{-5}	1×10^{-5}	1×10^{-5}	1×10^{-5}	1×10^{-5}
Rotary piston pump capacity	m ³ /h	250	520	630	2x520	630	2x520
ROOTS pump capacity	m ³ /h	1000	3000	4000	2x4000	4000	2x4000
Diffusion pump capacity "five phases autocleaning jet"		OPTION					
Automatic cycle control		PC O TABLET					
Electrical power supply installed (cosq 0,8)	KW	12	30	40	48	40	48
Absorbed electrical power	KW	6,5	15	20,5	24	20,5	24
Approximate delivery weight	Kg.	1000	2000	4800	6000	4800	6000

The technical characteristics shown in the table above are purely indicative.
Kolzer reserves the right to give precise details during machine manufacturing.

The DGK and MK plasma plants come with the following treatments:
cleaning and etching
PECVD e PACVD deposition
MOCVD deposition
sterilization

Plasma generation techniques available:
DC - MF - RF - MW



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