



***iPLASMA***

**VETAPHONE**

# ***INVENTIONS THAT LAST*** ***PIONEERS IN SURFACE ADHESION***

INTERACTIVE BROCHURE 



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# iPLASMA

**Whether you are considering full-scale production or a lab-sized testing system, iPlasma offers complete control of the process and the ability to create a variety of different surface conditions.**

With the emergence of advanced and intricate substrates, some applications can pose unique challenges that can be difficult to address.

Some are impossible to solve or are rectified in an expensive way that involves harmful components which can contaminate the production area for operators and are harmful to the environment.

There is a more advanced technology available - iPlasma®

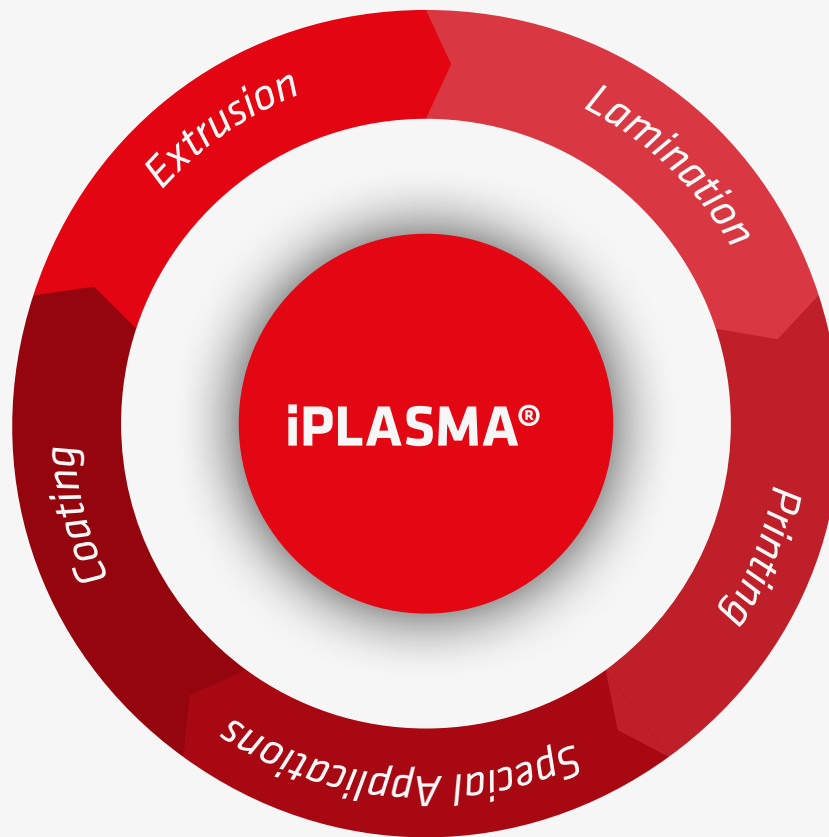
Created in a controlled atmosphere, adding small quantities of dopant gas for grafting, offers different functionality and a whole range of surface abilities.

iPlasma® has low heat impact on the surface, which enables versatile controlled and tuneable surface chemistry to be achieved. It can be considered as a gas primer that efficiently replaces both the use of Corona treatment and liquid primer.

Vetaphone supplies a complete solution that can be integrated with any type of roll to roll machine.

[FIND OUT MORE >](#)

# iPLASMA APPLICATIONS



Capable of being integrated in any roll to roll machine, iPlasma is an eco-efficient process that reduces cost, energy consumption, and has reduced environmental impact.

Compatible with flexo (CI and inline), rotogravure, digital and hybrid printing lines using water-based or UV inks and lacquers, and laminating lines. It also has applications in specialised markets such as printed electronics, photovoltaics, speciality films, and extrusion.

## **THE DIRECT BENEFITS OF THIS 'ALL-IN-ONE' ECO-EFFICIENT PLASMA PROCESS ARE:**

- Reduction of costs
- Lower energy consumption
- Reduced impact on the environment

# iPLASMA

## TECHNOLOGY

In 95% of cases, Corona treatment of a substrate is still the perfect way to improve surface adhesion and deliver a first-class product. By modifying the surface energy of a non-absorbent material, like film or foil, Corona treatment allows inks, lacquers and film to adhere correctly and uniformly, producing a quality result.

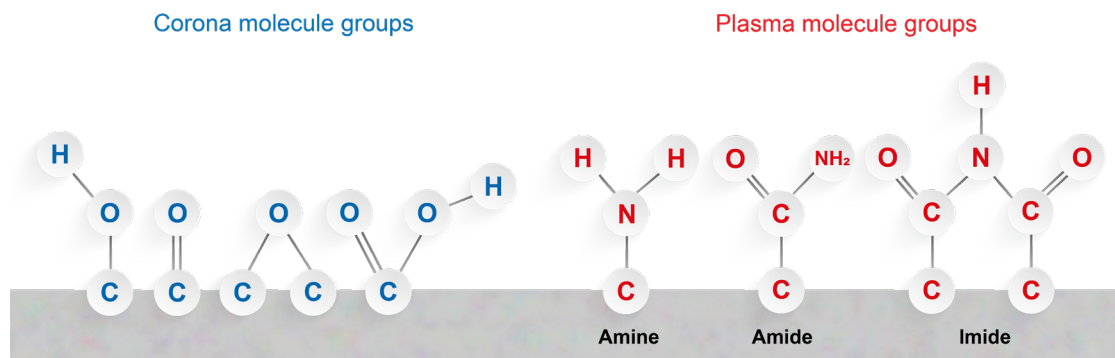
But, in some cases, Corona treatment will not work because of the complexity of the chemical make-up of the substrate - and in these situations Plasma treatment is needed to allow a secure bond.

The simple difference is that where the Corona process is carried out in ambient air, iPlasma treatment requires a controlled environment and the use of a dopant gas.

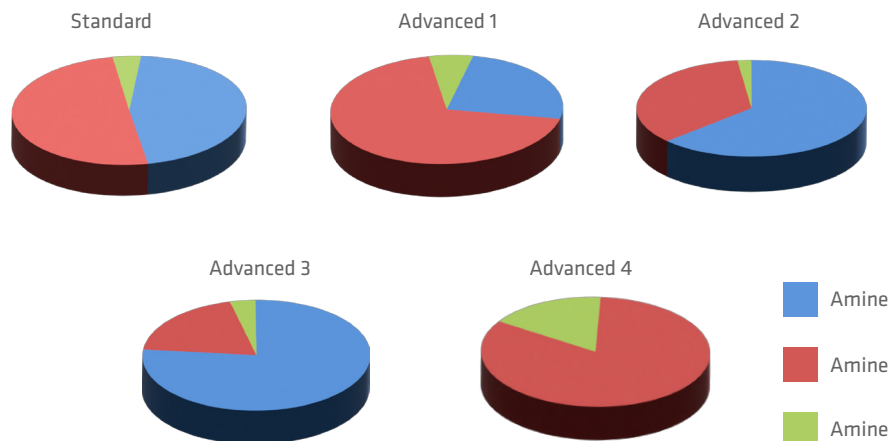
iPlasma is unique due to its highly controlled and monitored atmosphere. Unlike older technologies, iPlasma is fully controlled and can be used in large-scale production systems as well as lab sized equipment.

iPlasma Grafting works with a nitrogen based atmosphere that can be mixed with other gases, known as dopants, to create other groups, or tune the quantity of the desired Amine, Amide and Imide groups.

iPlasma offers highly controllable solutions that make it possible to tune the surface chemistry to any required specification to achieve good adhesion and create chemical bonds to inks and adhesives that requires this environment.



The figure illustrates how each of the Nitrogen molecule groups are created, depending on the composition of the nitrogen based atmosphere.



We can tune the chemistry in any direction required, and some of the different and proven recipes are shown above.

# iPLASMA

## FOR PRINTING

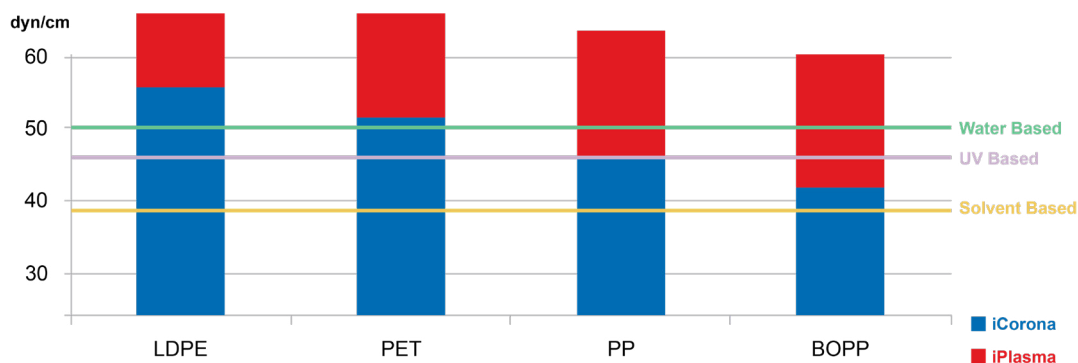
### ► FOR UV AND WATER BASED PRINTING

Where solvent based printing typically needs 38 or 40 dyn/cm, the surface tension requirement for UV and water based printing is typically between 44 and 50 dyn/cm.

For some materials, Corona treatment can reach these targeted dyne levels, and in those cases Corona is still the most cost efficient solution. However, other materials are more difficult to treat, and cannot reach the requisite dyne level.

Previously, the solution had been to use chemicals: either by priming the material, or changing the ink chemistry so it could adhere to the material. This is not only expensive but is harmful to both the environment and the machine operators using the liquid solvent primer.

iPlasma solves these problems by changing the molecules on the surface to nitrogen-based instead of oxygen-based; resulting in higher dyne levels and extremely good adhesion. Polypropylene substrates are typical of difficult to treat materials, as shown on the graph, but 60 dyn/cm can be achieved on raw untreated BOPP, a widely-used product that cannot be printed with water and UV based inks, if purchased without primer. Tuning the exact chemistry to the specific application completely removes the need for primer, and removes problems associated with changing the components of the ink, such as the ink drying on the printing plate.



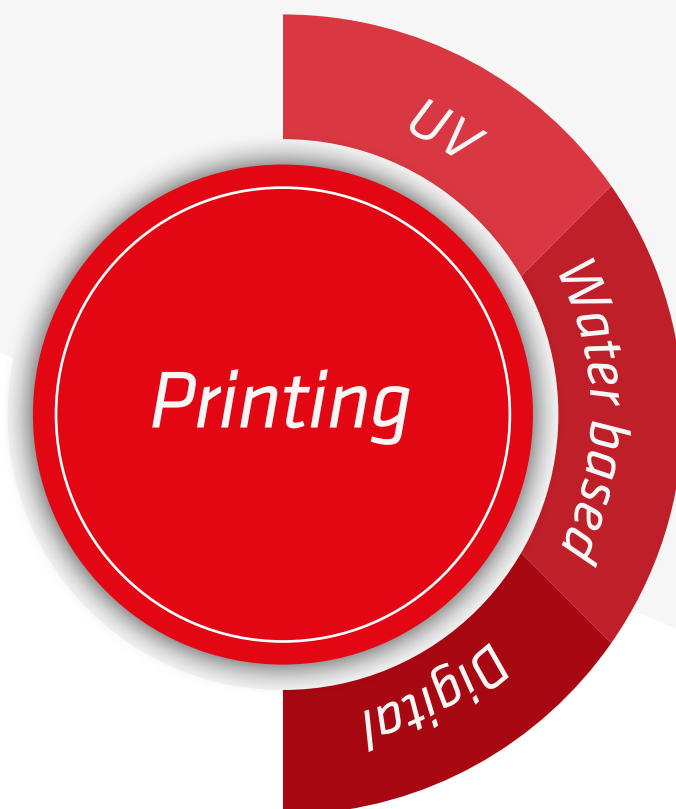
### ► FOR DIGITAL PRINTING

Corona is ideal for applications where oxygen-based molecule groups on the surface increase the adhesion. But the ink used for digital printing needs a chemical connection to the surface that requires different chemistry.

Today, most digital technologies require the substrate to be coated with a primer prior to printing; this is achieved by buying pre-primed substrates, or, with some of the digital presses having an inline priming unit.

iPlasma can replace some of these primers by creating a similar chemical composition on the surface. This works like a gas-primer, making iPlasma far more cost effective, and removes the environmentally harmful liquid primer from the production floor.

# iPLASMA FOR PRINTING



## TECHNICAL SPECIFICATIONS

iPLASMA FOR ALL MACHINE TYPES:	SPEED RANGE	WIDTH RANGE	SIDES TO TREAT
Flexo (i.e. Comexi, W&H, Bobst Bielefeld, Soma, Uteco)	300 - 600 m/min 1000 - 2000 ft/min	600 - 1600 mm 23 - 63"	Single and Double Sided
Rotogravure (i.e. W&H, Bobst Rotomec, Uteco, KYMC)	300 - 600 m/min 1000 - 2000 ft/min	600 - 1600 mm 23 - 63"	Single and Double Sided
Narrow Web (i.e. Nilpeter, MPS, Mark Andy, Bobst, Omet)	100 - 300 m/min 330 - 1000 ft/min	600 - 1600 mm 23 - 63"	Single and Double Sided
Digital (i.e. HP Indigo, Océ, Xerox, Screen, Seiko Epson)	20 - 100 m/min 65 - 330 ft/min	200 - 860 mm 7 - 34"	Single and Double Sided
Special (i.e. Tresu, Goss, Comexi)	1 - 800 m/min 1 - 2625 ft/min	200 - 2600 mm 7 - 103"	Single and Double Sided

# iPLASMA

## FOR LAMINATION

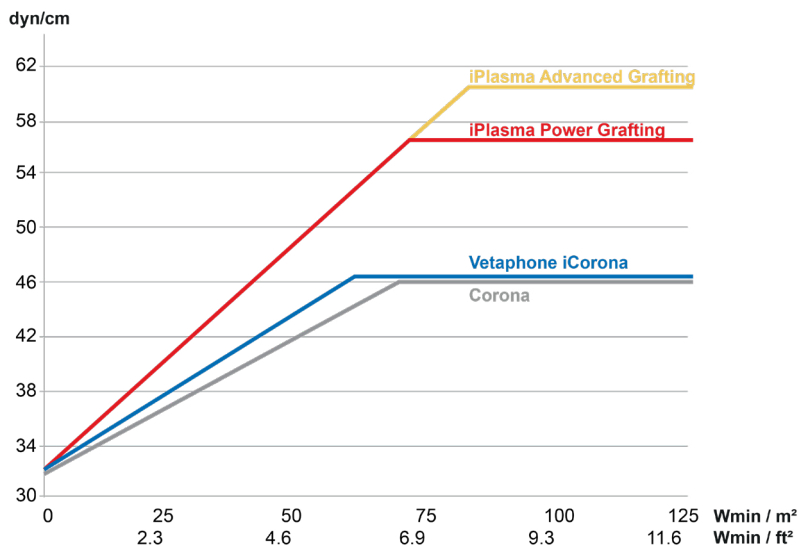
### ► FOR UV & WATER BASED LAMINATION

Solvent based adhesives have been commonly used in lamination for many years. In the search for alternatives, certain challenges have arisen. Where solvent based lamination typically needs lower surface energy, and benefits from Oxygen-based chemistry, UV and water-based lamination have different demands, because they need a higher surface tension, and a different surface chemistry.

The solution has always been chemical: either priming the material, or changing the chemistry in the adhesive so it could adhere to the material.

By changing molecules on the surface to nitrogen-based instead of oxygen-based, a higher dyne level and good adhesion is achieved. Polypropylene substrates are typical of what are considered difficult materials to treat. But, as shown on the graph, 60 dyn/cm can be achieved on raw untreated BOPP, a widely-used product that cannot be laminated with water or UV based adhesives, if purchased without primer.

iPlasma is the most cost effective solution for UV and water-based lamination. Tuning the exact chemistry to the specific application completely removes the need for primer, and therefore removes the issues of films losing transparency, or becoming mid-coloured because of the primer.



### ► FOR THERMAL LAMINATION

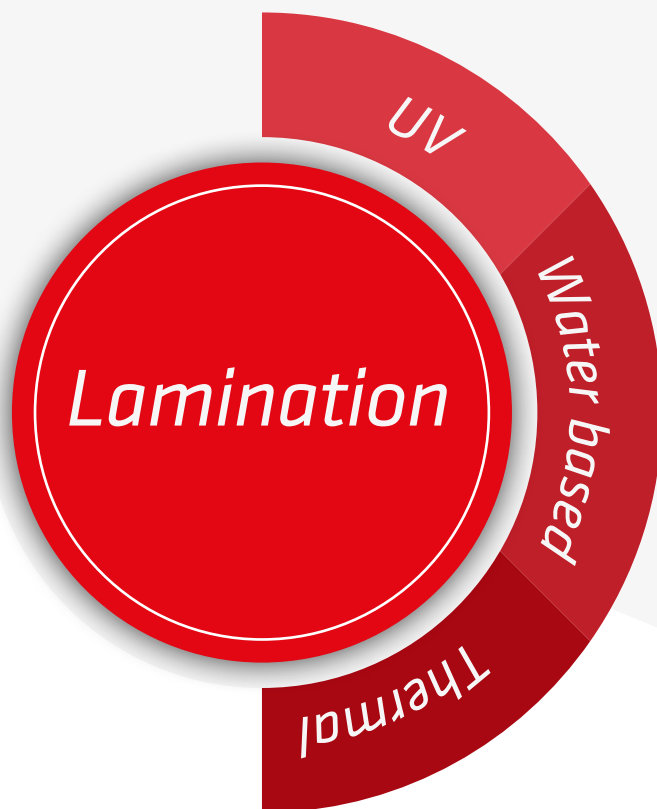
Thermal lamination is widely used with a variety of materials. Previously, the majority of applications were with paper or board, so the need for surface adhesion had less of a focus.

Today, a wide variety of special printed products using all types of print technologies, mean that products have a large printed area. These include thick layers of ink, intense colours, and paper with a high moisture content. To laminate successfully on these printed products requires surface treatment. In many cases, Corona treatment is sufficient, but where high ink coverage combines with materials that are difficult to treat, iPlasma can be the right solution.

iPlasma treats both the film and the printed areas to very high dyne levels (72+ dyn/cm) and creates specifically tuned chemistry that matches the adhesives used in the thermal lamination process.



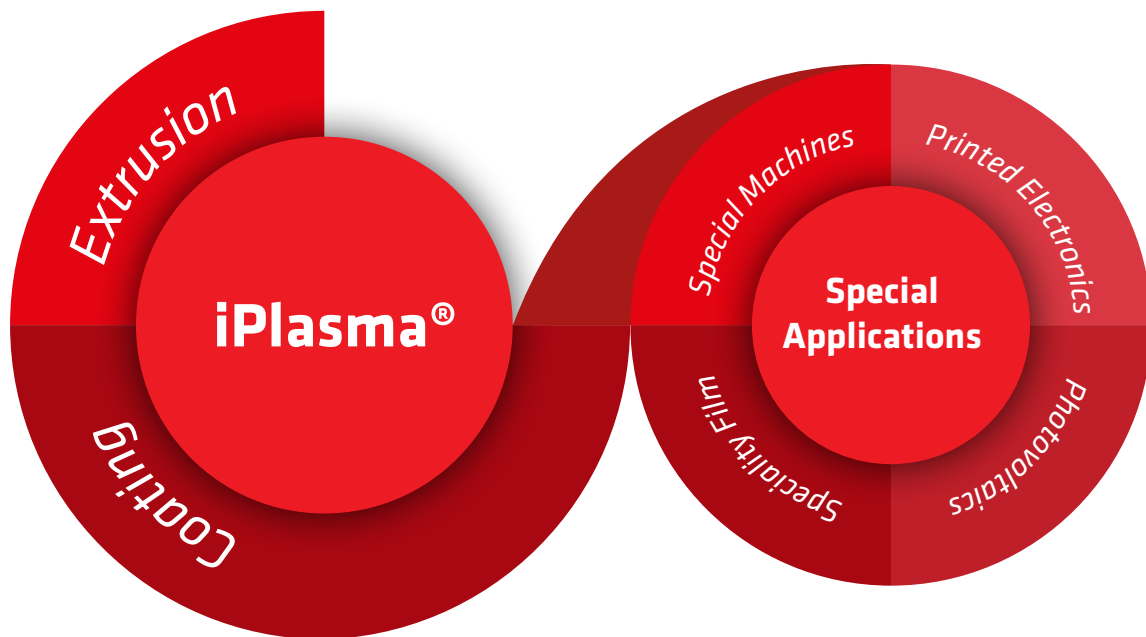
# ***iPLASMA FOR LAMINATION***



## **TECHNICAL SPECIFICATIONS**

<b>IPLASMA FOR ALL LAMINATION MACHINE TYPES:</b>	<b>SPEED RANGE</b>	<b>WIDTH RANGE</b>	<b>SIDES TO TREAT</b>
Lamination (i.e. Comexi, Nordmeccanica, Soma, Webcontrol)	300 - 500 m/min 330 - 1650 ft/min	600 - 1600 mm 24 - 63"	Single and Double Sided

# ***iPLASMA APPLICATIONS***



## **► FOR PRINTED ELECTRONICS**

The special inks used, combined with the need for adhesion to specific materials for printed electronics, requires surface properties that can be obtained only with Nitrogen-based surface chemistry.

iPlasma creates the necessary surface chemistry that meets the adhesion requirements of the special inks and materials. Where iPlasma excels, is its industrially proven low running cost, which enables the lowest price per square metre.

## **► FOR PHOTOVOLTAICS**

Solar panels need the print material to be transparent so the photovoltaics can work at maximum efficiency. But, using a primer significantly lowers this transparency.

iPlasma removes the need for the primer, and enables direct printing on the material.

## **► FOR SPECIALITY FILM**

Pioneering technology is not limited to the applications that are already on the market. There is no need to be limited by the chemical means of solving adhesion problems that are offered by the ink and adhesive manufacturers; if a special ink or adhesive is needed, it is likely that a more standard and cheaper alternative, if paired with iPlasma can offer a cheaper and better product.

iPlasma has already created new products that were impossible to produce using conventional solutions.

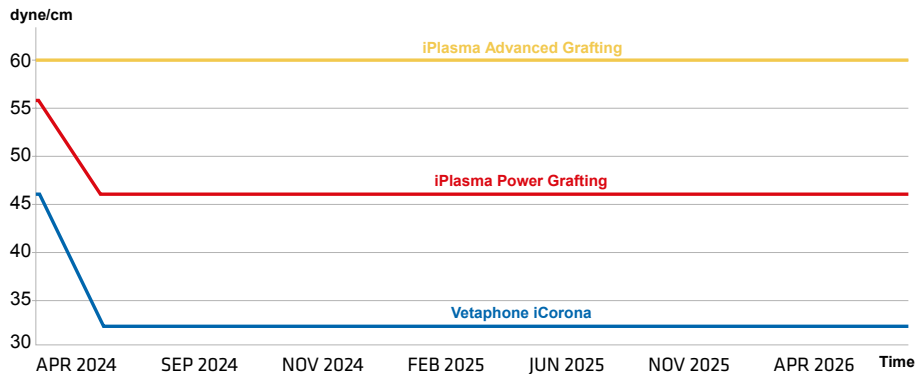
## **► FOR SPECIAL MACHINES**

iPlasma can be mounted on any machine that can accommodate a Corona treater. iPlasma equipment comes in all shapes and sizes, from narrow web printing lines to slitter rewinders, catering for both online and offline processes. This allows one iPlasma installation to feed several offline machines running at high speed.

## ► FOR EXTRUSION

Extended shelf-life for substrates has long been demanded in the converting industry. Typically, it is recommended that materials are processed within six months of purchase. However, this creates additional expense because of logistical demands of internal handling, and the risk of having to scrap a large volume of substrate.

iPlasma overcomes this problem, because materials can be treated to a high and lasting dyne level that is guaranteed for 12, 18, or 24 months.



### TECHNICAL SPECIFICATIONS

iPLASMA FOR ALL MACHINE TYPES:	SPEED RANGE	WIDTH RANGE
Brown Film (i.e. Reifenhäuser, W&H, Macci, Davis Standard)	20 - 150 m/min 65 - 500 ft/min	500 - 3000 mm 20 - 118"
Cast (i.e. Reifenhäuser, W&H, SML, Davis Standard)	50 - 500 m/min 165 - 1650 ft/min	2000 - 6000 mm 78 - 236"
Stratch (BOPP) (i.e. Brückner)	225 - 600 m/min 750 - 2000 ft/min	4000 - 10 400 mm 157 - 410"

## ► FOR COATING

'Coating' is a generic term used for many different types of coatings and primers and for several different types of applications. These include coating the material in preparation for converting processes, or coating as the final finish, after converting processes have been completed. All coatings share common drawbacks: they are expensive to apply and require an intensive drying process. These create high production costs, and the long web path through the machine results in a large amount of waste at every job change.

iPlasma offers alternative solutions to each of these. It can work as a gas primer, to prepare the surface for subsequent converting processes, or make the actual coatings on its own - or any variation of these. Benefits of iPlasma include thinner coatings, a thinner final product, excellent wettability, gas-priming of all polymer materials, lower running costs, and instant drying of the coating, resulting in less waste.

### TECHNICAL SPECIFICATIONS

iPLASMA FOR ALL MACHINE TYPES:	SPEED RANGE	WIDTH RANGE
Coating Lines (i.e. Kroenert)	300 - 1000 m/min 1000 - 3300 ft/min	600 - 1600 mm 23 - 63"
Narrow Web Post Converting Lines (i.e. AB Graphics, Grafisk Maskinfabrik)	100 - 300 m/min 330 - 1000 ft/min	250 - 860 mm 9 - 34"

# iPLASMA EQUIPMENT



## Oxygen Measurement

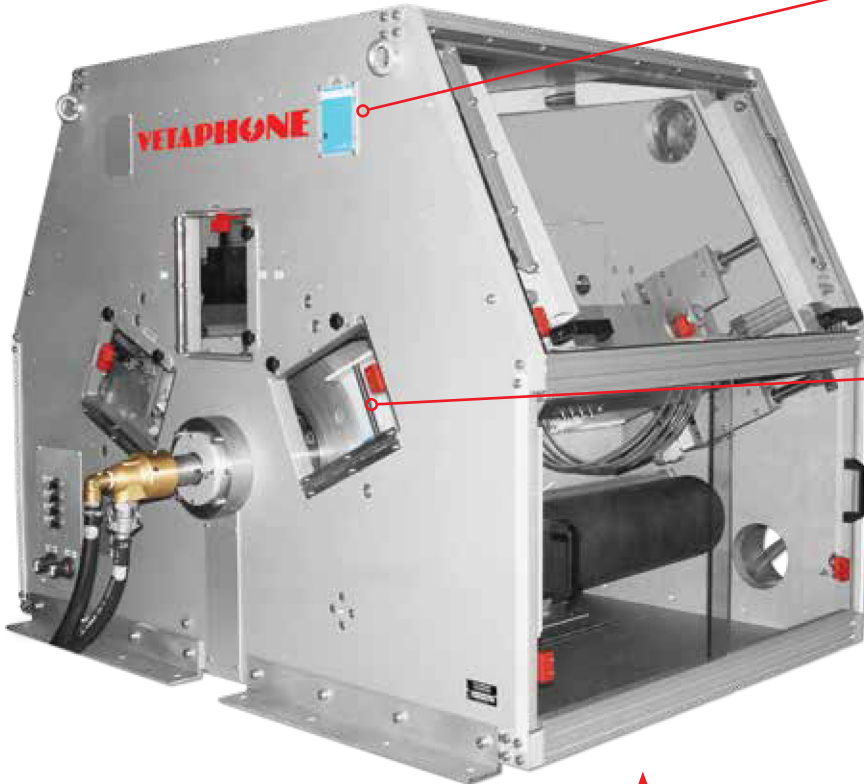
To ensure the controlled atmosphere in the iPlasma processes, our oxygen measurement devices are able to measure the strict demands for PPM level.



## Electrode System

Specially designed Quick Change electrode cartridges secure a unique uniform dispatch of gases even at a ultra-low gas consumption. The Quick Change iPlasma systems are constructed with optimum parallel discharge points, with perfect alignment, and can be supplied with metal or ceramic electrodes.

## Mixed Gas



## Proof of Concept

Before investing in an iPlasma system, proof of concept is the first step to ensure the best result. An iPlasma system is a big investment and proof of concept is the first step to showcase the very best results. We have a purpose built showroom at our HQ in Denmark which has two installed test lines for iPlasma surface treatment. We welcome you to book a time to visit us - in-person or virtually - to see the results for yourself.

The equipment is capable of running production speeds up to 300 m/min with a working width of 1200 mm. Our expert team of

qualified engineers have advanced tools for analysis and control of surfaces like contact angle, surface energy measurements, specific O2 and H2O permeation tests, and tests for adhesion and release. Furthermore we have a close partnership for advanced surface analyses (ATR-FTIR, AFM, XPS, Tof-SIMS, etc.)

We have years of experience in test treatments and achieving excellent results based on our customers' needs. The process can be done with or without an NDA, depending on customer's wishes.

Please contact your local Vetaphone representative or scan this QR code to book a virtual showroom demo now.



SCAN ME



### Gas Mixer Control

The important gas mixing flow control is controlled and tested specifically in order to secure the exact properties on the film. Interfacing the generator system enables complete production control.



### Touch Control Panel

Our user friendly 10" LCD Touch control panel provides a graphical overview of the entire iPlasma system. The intuitive display offers a large variety of automatic intelligent controls such as Substrate Matching, Gas Mixer Control, Production Log, Proportional Control, Maintenance Schedules and Digital Documentation.



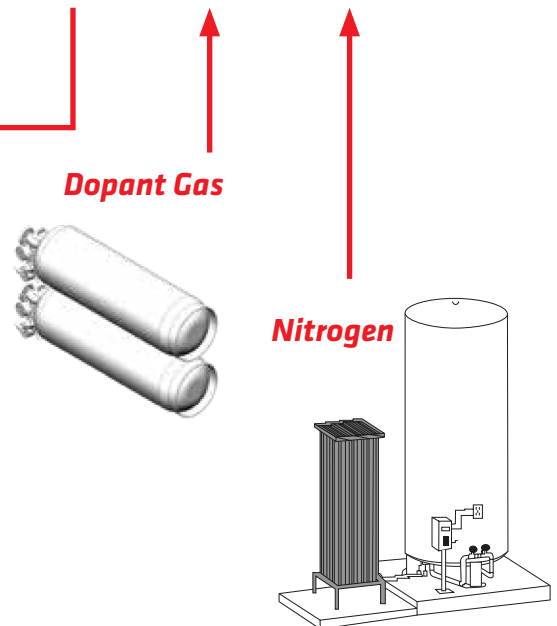
### Mixed Gas

### Verified Materials

The lists below are the materials, where we have already tested and verified that the different iPlasma Technologies work. If your material is not in the list, it is still very likely that it can be treated successfully with iPlasma.

*iPlasma Grafting has been successfully performed on the following materials:*

- PET
- PP
- BOPP
- PE
- PA
- PVC
- PVDC
- Printed Polymers
- Fluorinated Polymers (PVF, PVDF, ECTFE, ETFE, FEP and PTFE)



# **SATISFIED CUSTOMERS**

## **WORLDWIDE**



*WE HAVE BEEN REALLY SATISFIED WITH THE ENTIRE PROJECT. THERE WAS NO HESITATION SIGNING AN NDA, SO WE COULD GET THE PROJECT STARTED. IT WAS NICE TO FINALLY WORK WITH A COMPANY THAT LISTENED TO OUR NEEDS AND MADE A SOLUTION FOR US. THE QUICK CHANGE SYSTEM ENABLES US TO RUN WITH TWO DIFFERENT TYPES OF IPLASMA AND AT THE SAME TIME NORMAL CORONA. THE LOW CONSUMPTION OF GAS IS WITHOUT A DOUBT THE LOWEST WE HAVE BEEN OFFERED IN THE ENTIRE INDUSTRY. THE IPLASMA SOLUTION HAS HELPED WITH OUR COMPANY'S GREEN PROFILE. WE HAVE NOW REPLACED AN ENVIRONMENTAL UNFRIENDLY PROCESS WITH IPLASMA. NOT ONLY ARE WE SAVING A LOT OF MONEY ON OUR RUNNING COSTS, BUT EVEN BETTER, WE HAVE REDUCED OUR IMPACT ON THE ENVIRONMENT.*

**CHRISTOPHER LLOYD**, NDA SIGNED COMPANY

SCAN TO FIND YOUR  
LOCAL AGENT



SCAN ME

*Advanced Corona Treatment by*

**VETAPHONE**

*Inventor. Innovator. Pioneer.  
Your Only Choice.*

BOOK A VIRTUAL  
SHOWROOM DEMO NOW



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