



Coating Plasma Innovation

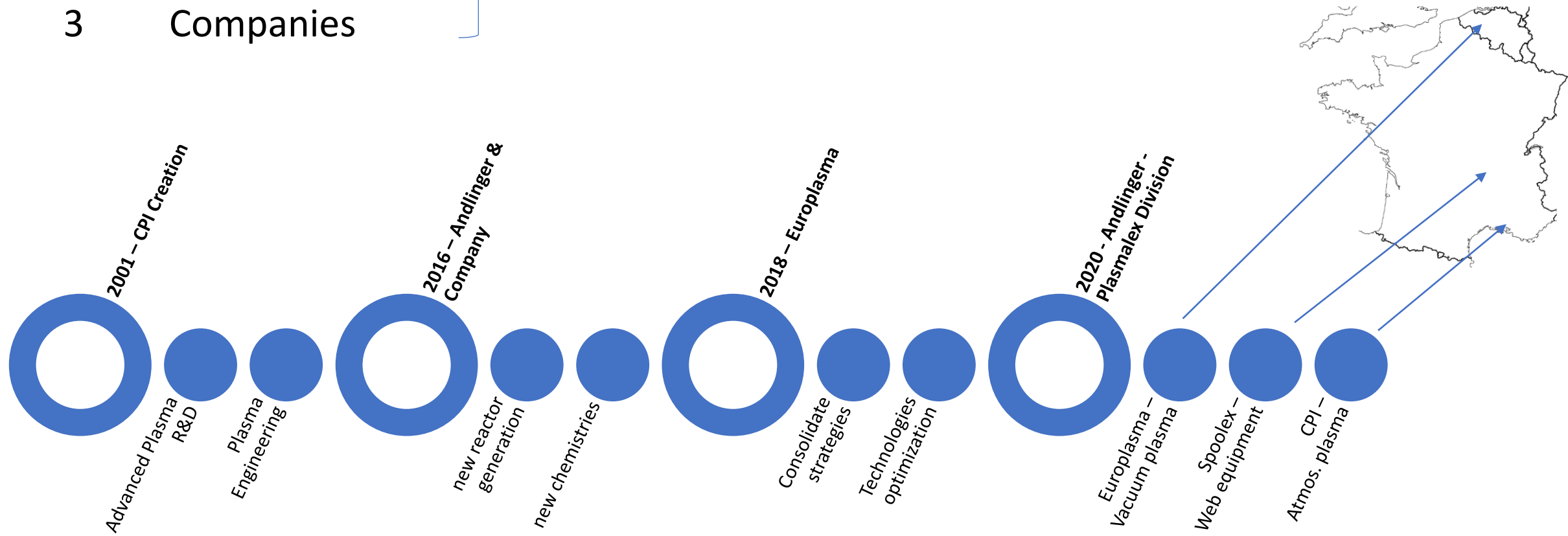
Pioneer in Roll-to-Roll Atmospheric Plasma Solutions

Company Presentation

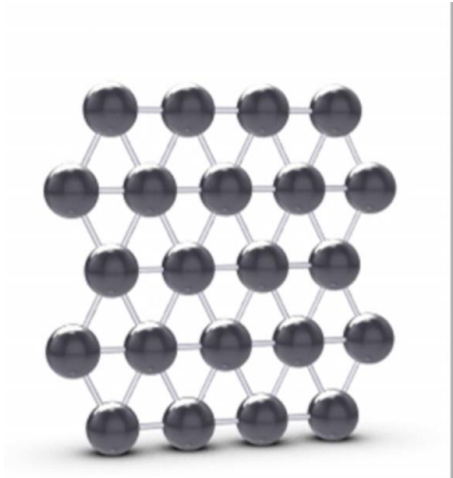
Introduction



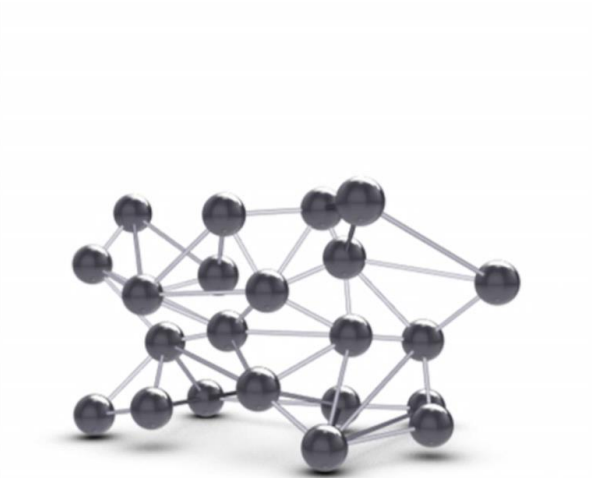
- 1 Strong Group
 - 2 Countries
 - 3 Companies
- 100 Employees



CPI expert in Atmospheric plasma since 2001 within a strong group



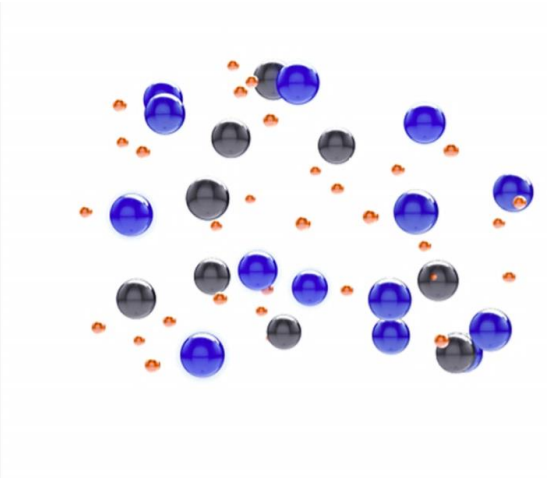
SOLID



LIQUID



GAS



PLASMA

Plasma is the 4th state of matter: ionized gas

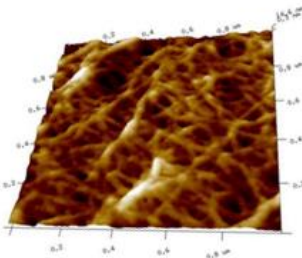


PLASMA

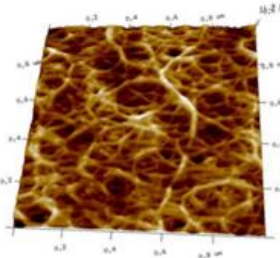
- ✓ Large web width
- ✓ Controlled atmosphere
- ✓ Homogenous treatment
- ✓ No damagesurface
- ✓ No backside treatment
- ✓ High performance treatment
- ✓ **Long lasting effect**
 - ✓ Cleaning
 - ✓ Activation
 - ✓ Grafting
 - ✓ Coating
- ✓ **Wide material range**
- ✗ Common technology
- ✗ Cost



Es = 60mN/m



Untreated



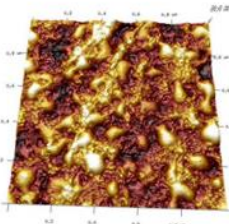
Es = 30mN/m

CORONA

- ✓ Very large web width
- ✓ Common technology
- ✓ Cost
- ✓ Cleaning
- ✓ Activation
- ✗ Grafting
- ✗ Coating
- ✗ Uncontrolled atmosphere
- ✗ Aggressive chemistry
- ✗ **Limited range of materials**
- ✗ Inhomogeneous treatment
 - ✗ Pin holes
- ✗ Backside treatment
- ✗ Low efficiency
- ✗ **Temporary effect**



Es = 38mN/m

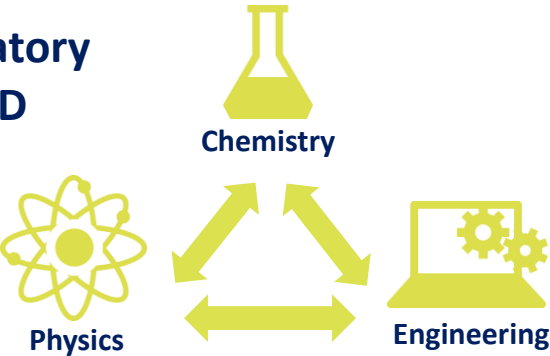


Microscopy (AFM) image of BOPP film
1 µm x 1 µm images (Tapping)

Plasma is offering Larger capabilities



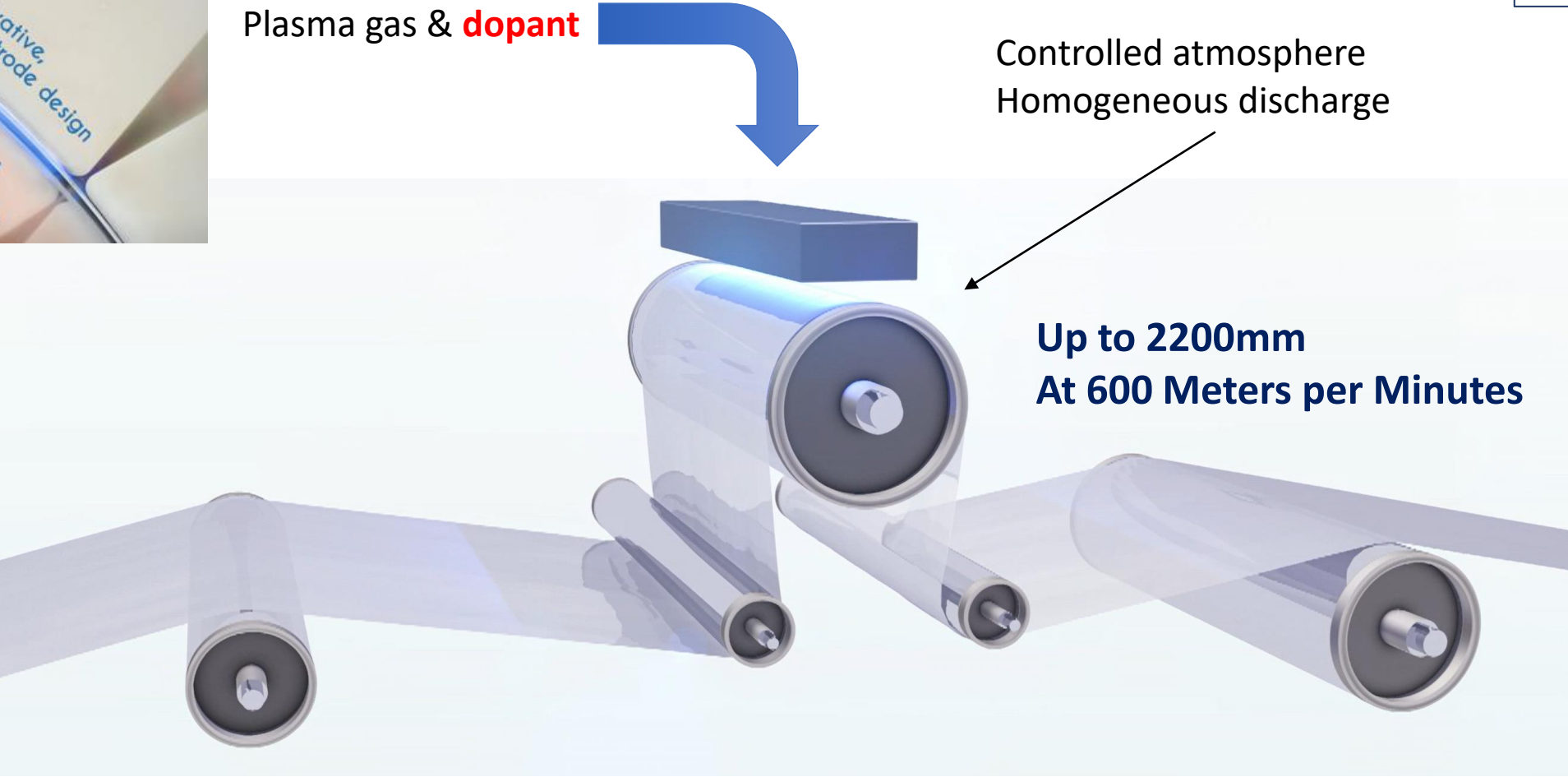
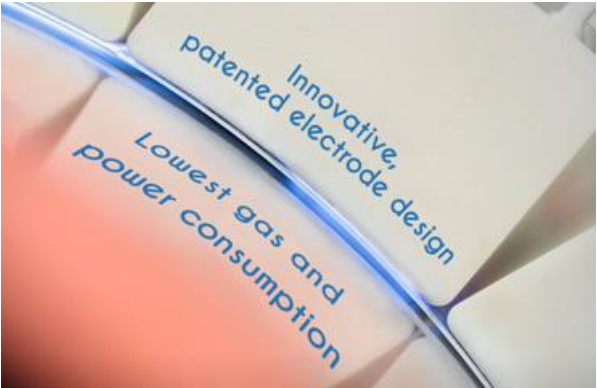
**Laboratory
R&D**



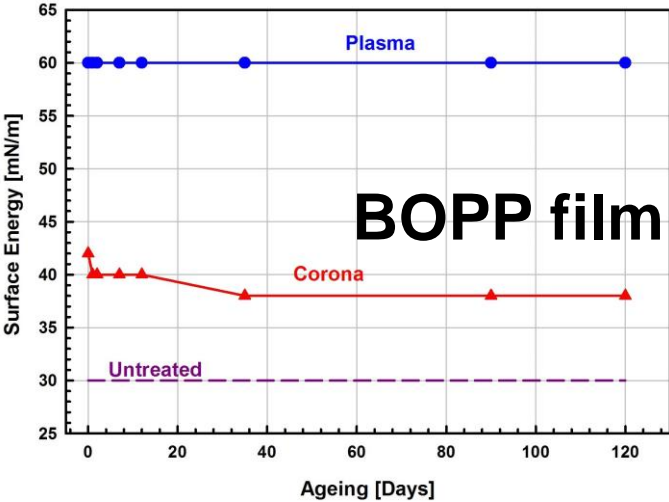
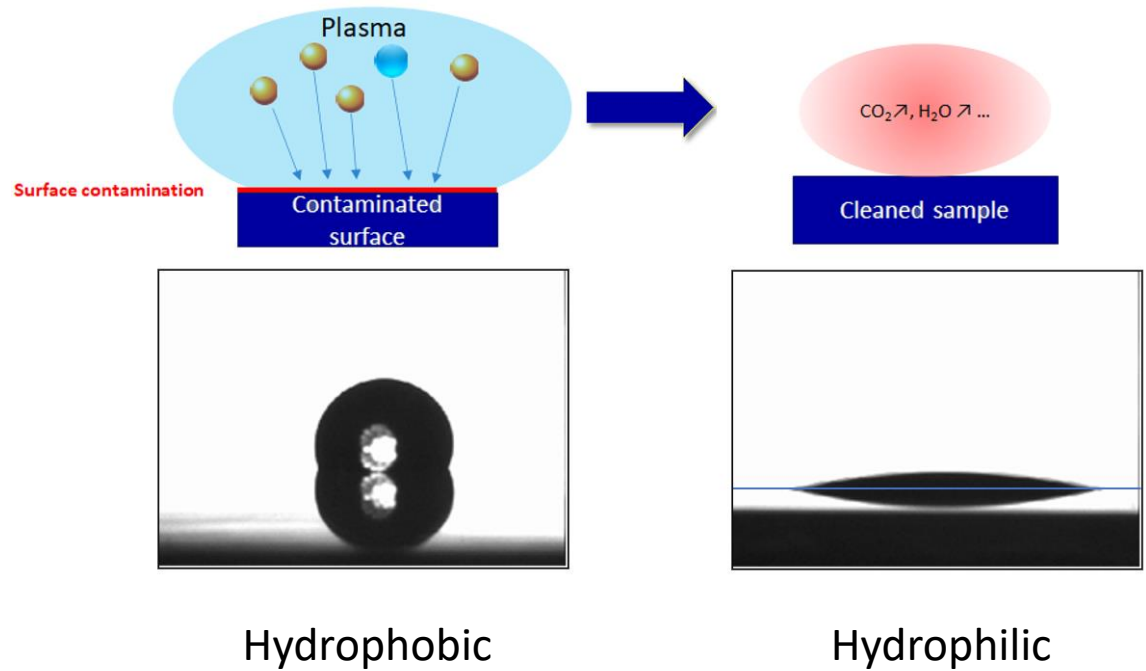
Industrial roll-to-Roll Atmospheric plasma

- Research & development
- Trials for specific applications
- Dedicated Analysis
- Toll manufacturing
- Equipment provider

Pioneer Laboratory is now delivering Industrial solutions



Dopant: Could be introduce in PPM with Plasma gas to optimize surface treatment.

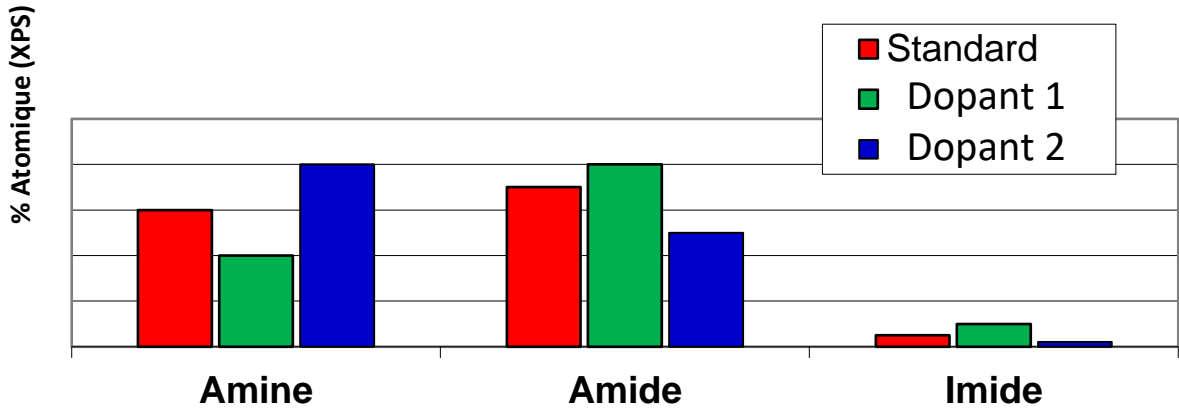
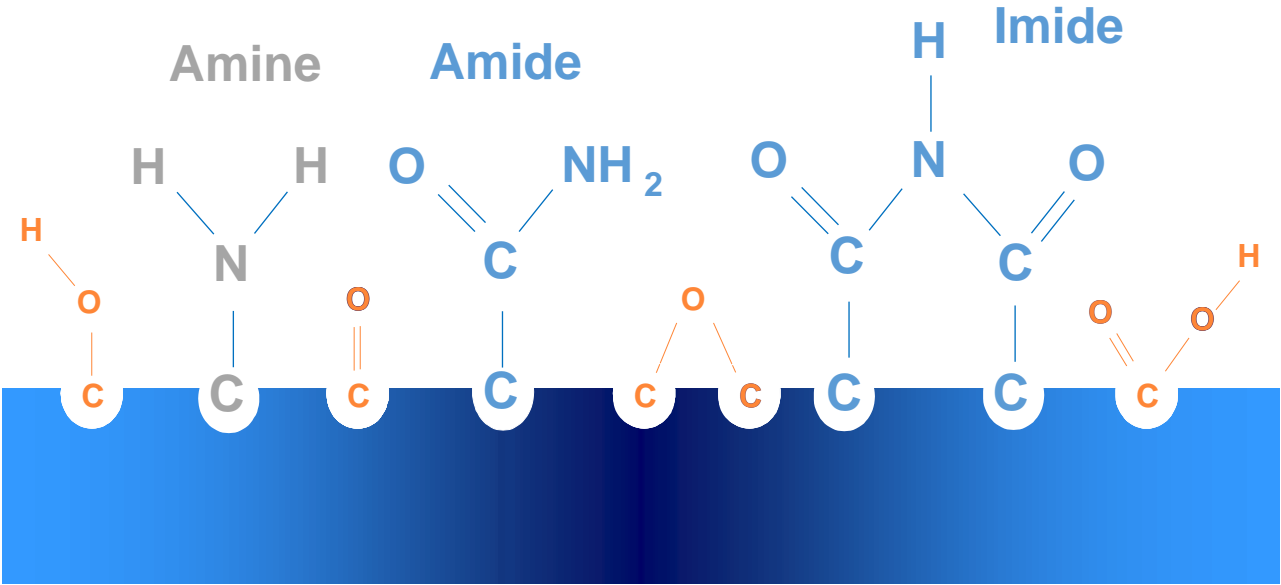


Removal of surface contamination without substrate degradation
Cleaning of ITO coating on PET contaminated by protective PE film

High Speed Performing and Long lasting treatment, higher surface energy

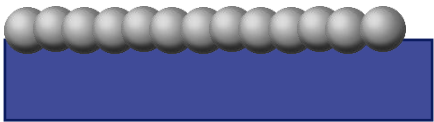
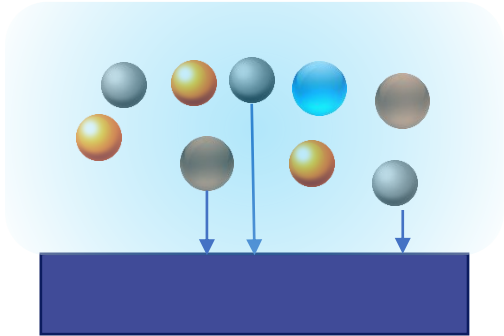


Gas:
 N_2 + dopants

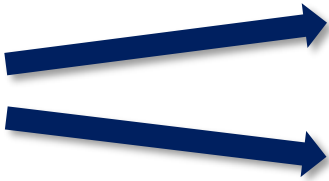
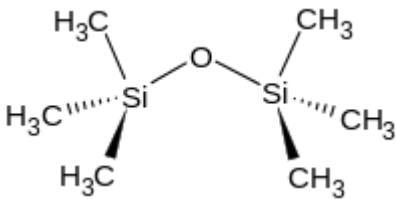


Substrate, Gas and Dopants are changing Grafting Chemistries

Specific molecules (precursor ●) are added to the plasma gas. Those molecules are activated (●) by the plasma and react with the sample surface to form a thin film.



HMDSO precursor



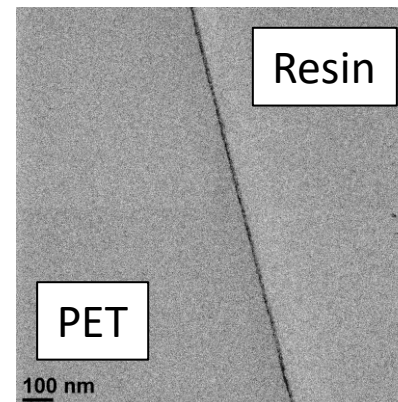
SiO_x film (hydrophilic)

SiC_yO_x film (hydrophobic)

Coating nature depends on precursor AND plasma chemistry



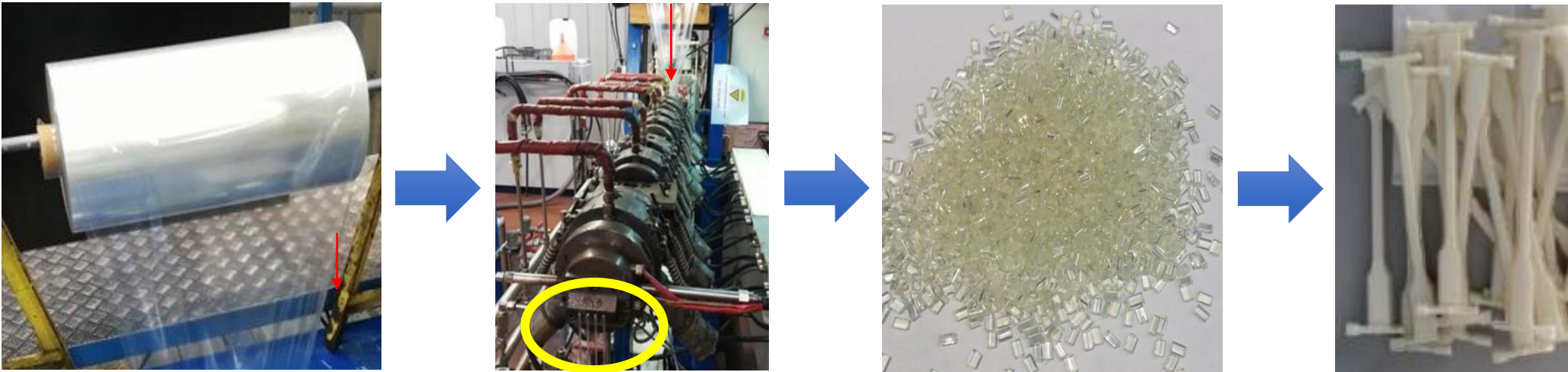
- Controllable Release Force
- Multi-Substrate : PE, PP, PET, PI...
- Compatible with PSA, PU, composite resins
- Stable performances, width, Length, Lots & Time
- Ultra Low extractible
- Recyclable
- Low environmental impact
- Compact device



TEM cross-section image
Showing 10nm Coating



Plasma treated Film re-extruded in pellets to testing strips



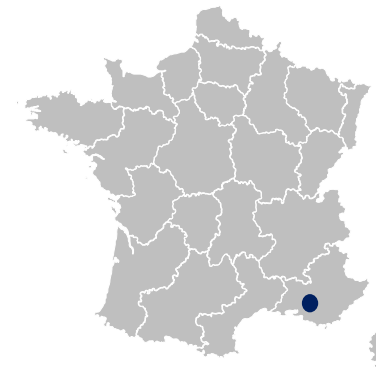
	Uncoated PET	Coated PET
Visocity (cm ³ /g)	59.6	58.2

➡ Plasma treatment does not alter polymer chain length

Our Plasma coated Films can be re-extruded and re-molded



- 2150m² Production including:
 - clean room
 - Laboratory
- 5 roll-to-roll plasma tool install up to 2 Meters width



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