



The MAGIC that MATTERS

mpg.
molecular plasma group

A unique surface treatment
technology enabling adhesion,
release, barrier, bio-molecule
immobilisation
and more....

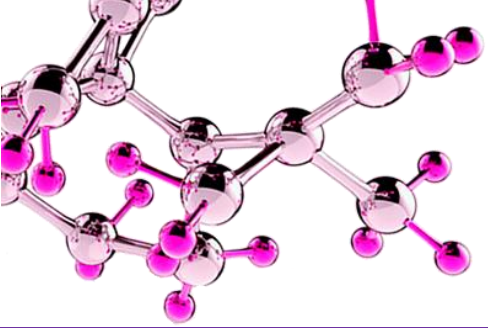


Soft Plasma & Molecules

Technology video

<https://vimeo.com/328464312>



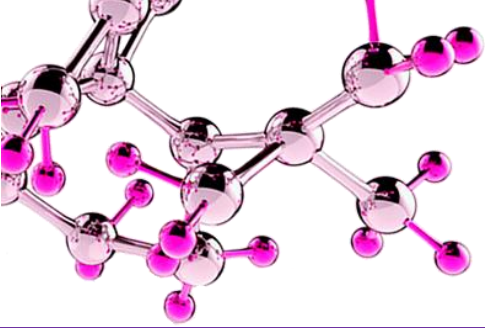


Soft Plasma & Molecules

Key differentiators

- Single-step, dry, low energy, easily scalable process
- Fast process
- 30 – 500 nanometer molecular layer grafted with covalent bonds onto the activated surface
- Durable modification of the chemical composition of the surface
- Extremely wide range of precursor molecules (organic, inorganic, biomolecules, nano-particles,...)
- On any substrate



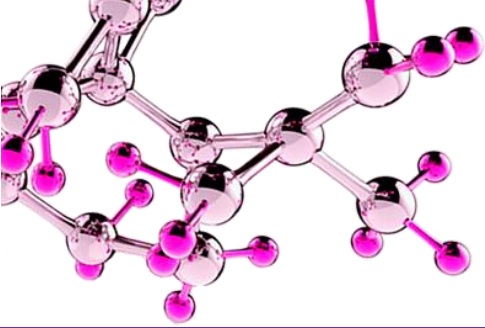


Molecular Plasma Technology

Ready for Industry

- Highly experienced team with proven track record
- Global After Sales support network
- EC certified equipment
- Statistical Process Control
- In-line quality control system
- Remote Diagnostics
- Seamless integration in your production process





Our DNA

Customized solution design for advanced surface functionalization

- MolecularGRIP™
Adhesion improvement for difficult-to-bond or sensitive materials or coatings
- Silicone-free anti-stick functionality
- New barrier solutions
- Superhydrophobicity & hydrophilicity
- Immobilization of biomolecules





Our DNA

Customized solution development with industrial follow-through

Customized Solution
Development Services

Leveraging

- Our Knowhow
- Our IP
- Our Technology

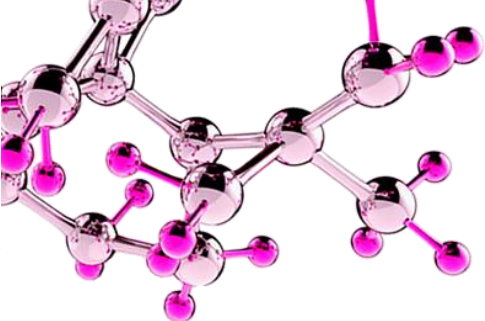


Lab Equipment



Customized
Industrial solutions





Business Model

Platform strategy

Development services

Customer funded solution development services => industrialization of the solution

Manufacturing

Pilot production
Contract manufacturing



Our DNA
Technology, IP, Knowhow
& Equipment

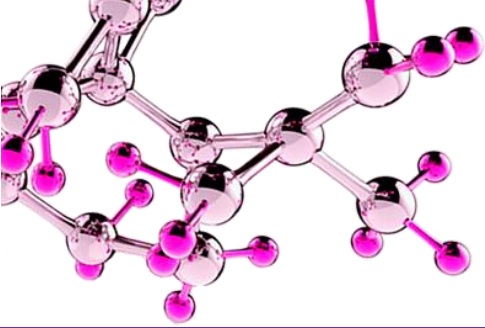
JV's / Spin-off's

Product or market specific

Partnerships

Joint Development
Agreements





Molecular Plasma Technology

Applications and Markets

Adhesion & Release

- Composite structures
- Fibre treatment
- Film treatment
- Textile treatment
- Silicone-free release films

Biomolecule Immobilization

- Anti-microbial
- Wound dressings
- In Vitro Diagnostics
- Microfluidics
- Affinity Purification

Superhydrophobicity, Hydrophilicity & Barriers

- Water-proofing
- Anti-corrosion
- Easy de-icing
- Improved wetting
- Anti-condensation





Case Study

Fluorinated Films

The Problem

Fluorinated plastic films are valued for their resistance and impermeability. However, the integration of the EFEP film into composite structures is very difficult due to its inertness. Previous methods, such as wet chemical and traditional plasma activation of the surface did not meet the customer's requirements.

Our Solution

We solved the customer's problem by **grafting adhesion-improvement molecules onto the EFEP** film using our proprietary Molecular Plasma Technology. This allowed us to achieve perfect adhesion whilst maintaining the integrity of the EFEP film.





Case Study

Glass

The Problem

The current method of adhesion for items such as rear-view mirrors onto windscreens consists of manually applying a wet chemical primer followed by a resin such as polyurethane. The customer wanted to look at automating the process while reducing the toxicity and quantity of the chemicals used.

Our Solution

We produced a solution that met all technical specifications of its client, a major German luxury car manufacturer. Furthermore, as our solution **reduces** the use of **chemicals** by several orders of magnitude and can easily be **integrated** in their **automated manufacturing line**, we met all their expectations.



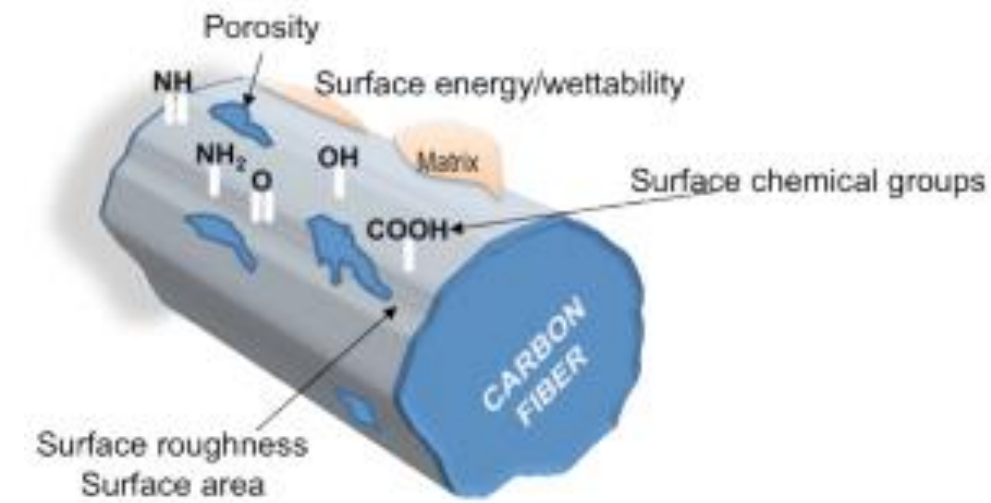
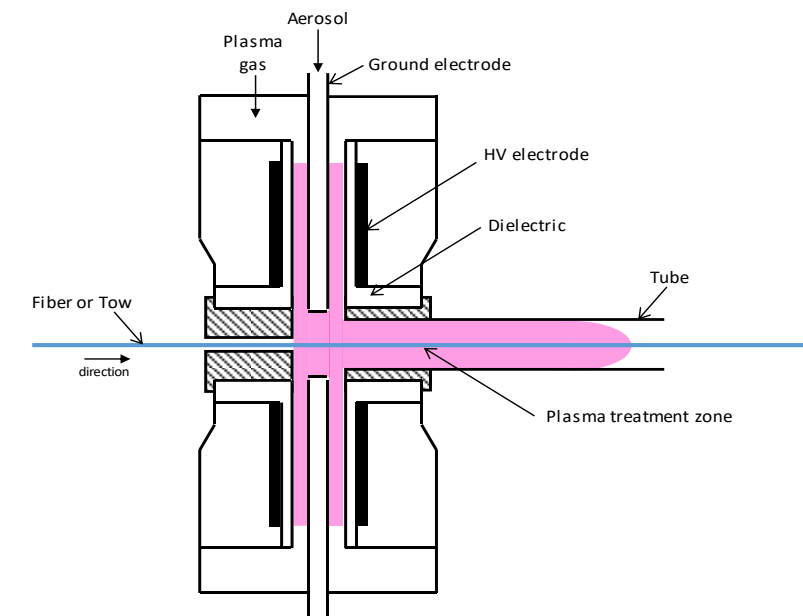


Fibre treatment

Adhesion improvement

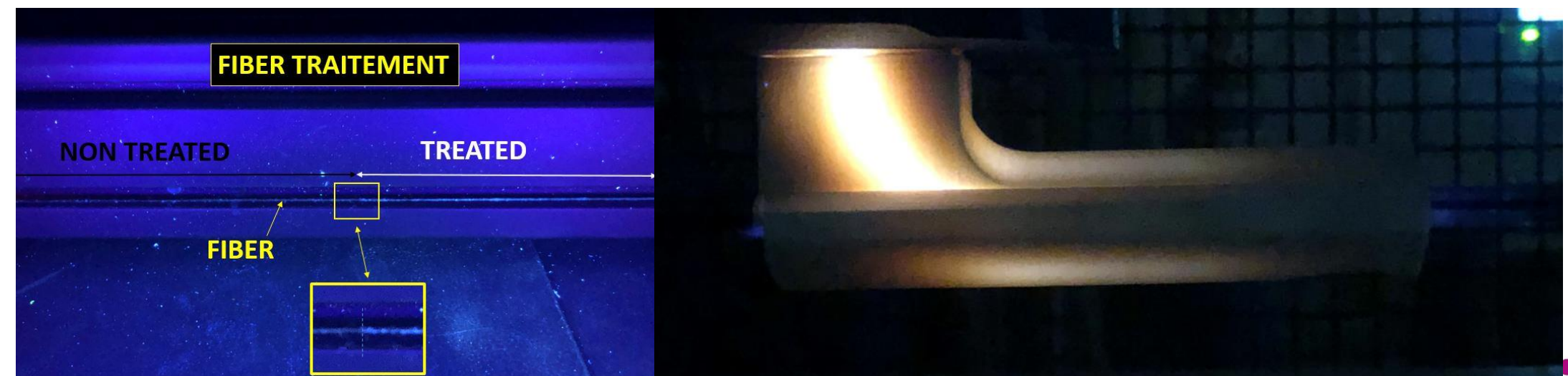
Surface functionalisation

- Remove weak boundary layer
- Enhance wettability
- Create active sites for chemical bonding
- Promote mechanical interlocking



Continuous treatment

- Fibres, tows & mats
- Any type of fibre
- Any type of substrate





Molecular Plasma Technology

Applications and Markets

Adhesion & Release

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- Film treatment
- Textile treatment
- Silicone-free release films

Biomedical

- Anti-microbial
- Wound dressings
- In Vitro Diagnostics
- Microfluidics
- Affinity Purification

Superhydrophobicity, Hydrophilicity & Barriers

- Water-proofing
- Anti-corrosion
- Easy de-icing
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Case Study

Plasma deposition of IgE

The Problem

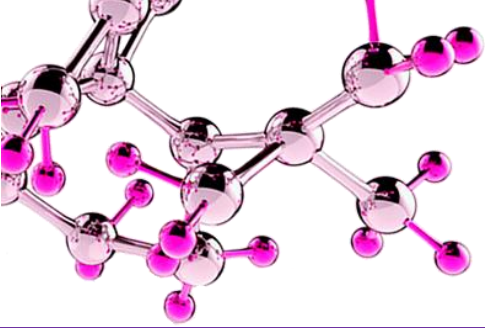
Current state of the art for immobilizing antibodies on a substrate (basis for IVD tests) is a multi-step, wet chemical process that takes between 24 to 72 hours because of required drying and incubation steps.

Our Solution

We are able to immobilize antibodies on a glass substrate using our proprietary Molecular Plasma process in **less than 10 seconds**. The samples were tested by the University of Leuven (Belgium) and showed comparable adhesion and biological performance (ELISA) as current standard.

We have shown that our process is **approx. 10.000 times faster and much simpler** than current standard. We anticipate **similar performance** with **other biomolecules** such as DNA, RNA, proteins and antimicrobial particles.





Biomedical Technology

Addressable market segments

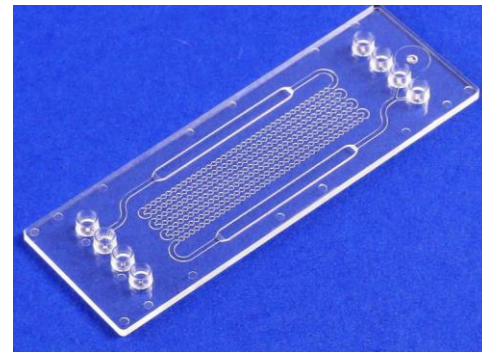
Segment #1

'Out-of-body'
medical
consumables



Segment #2

Micro-
fluidics



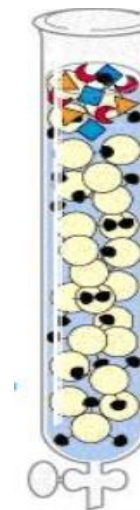
Segment #3

Advanced
dressings
& patches



Segment #4

Affinity
Purification
Technology



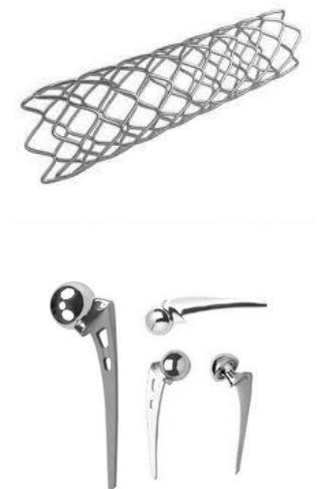
Segment #5

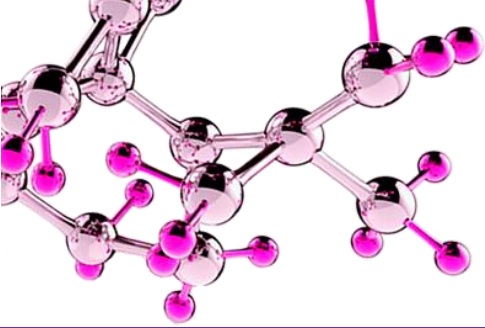
Life Science
Technology



Segment #6

Implants &
'In-body'
consumables





Molecular Plasma Technology

Applications and Markets

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Biomolecule Immobilization

- Anti-microbial
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Superhydrophobicity, Hydrophilicity & Barriers

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Case Study

Protection of natural cork products

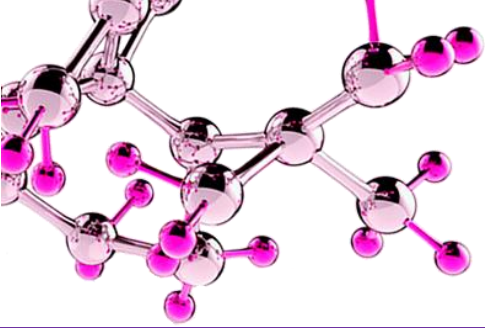
The Problem

The company approached us to tackle two problems they are facing with regard to the production of cork. Firstly, the cork reacts with the UV rays in sunlight resulting in a discolouration and secondly, the glued joints become weak as a result of contact with water. The company had tried wet chemical methods to solve these problems, however these resulted in changes of appearance and texture.

Our Solution

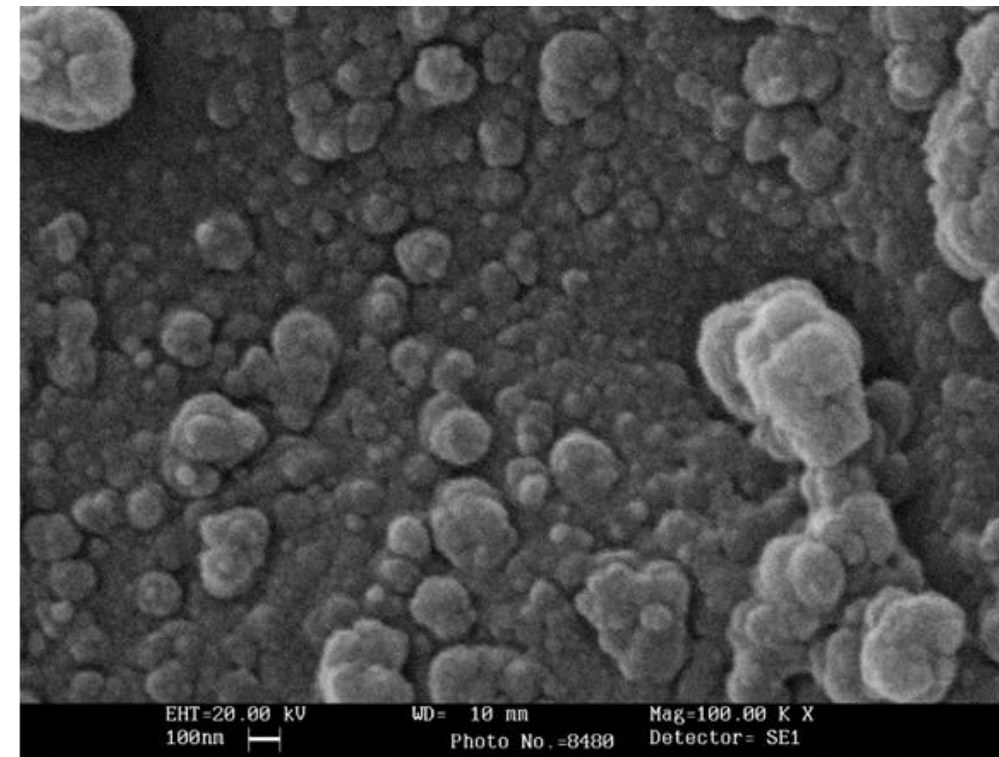
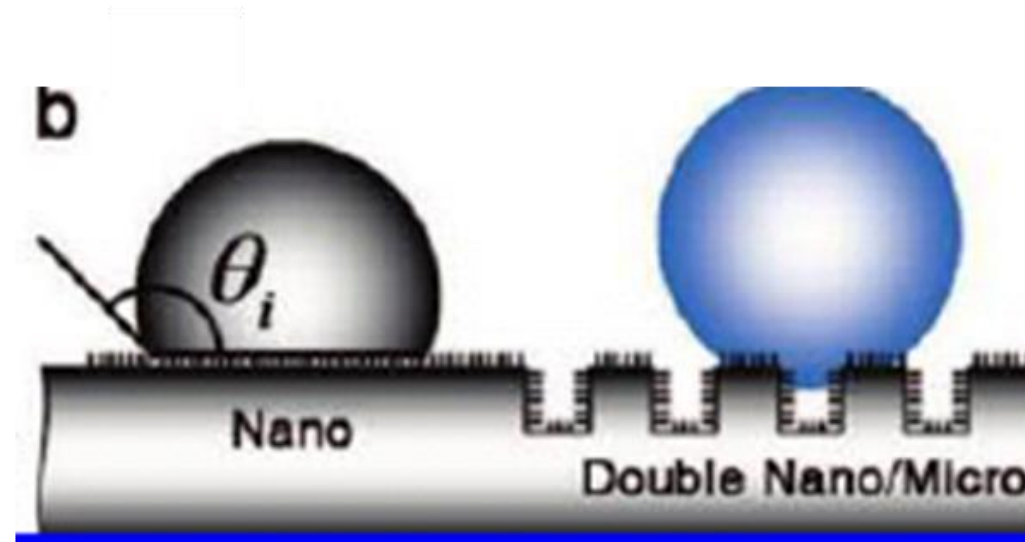
Using our super-hydrophobic Leaf Technology in which we incorporated a UV protection molecule, we were easily able to create a **water-repellent, UV-protected surface**, without altering the appearance or integrity of the cork.





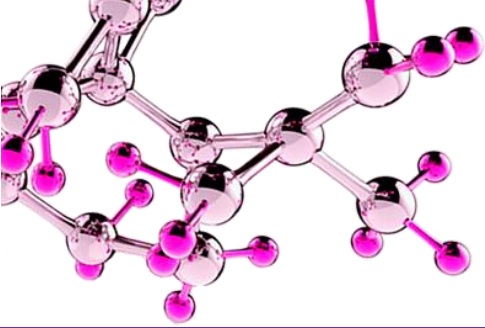
Superhydrophobicity

Tunable performance



- Superhydrophobic surfaces for water repellent surfaces or self-cleaning properties
- Tunable contact angle

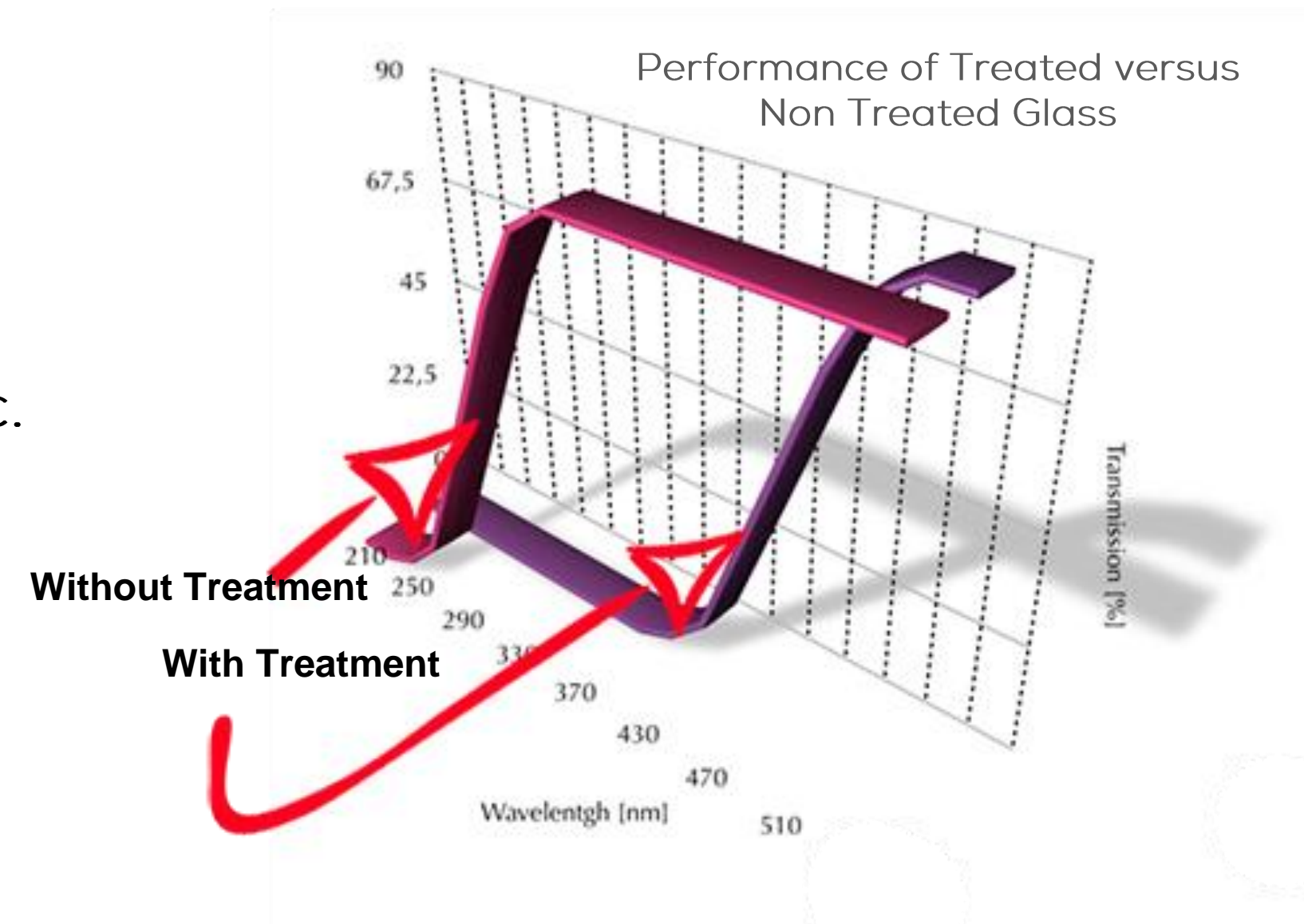


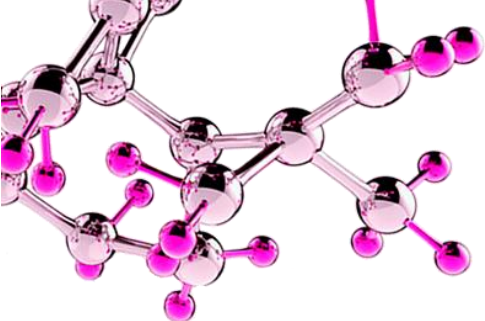


UV Protection

Tunable performance

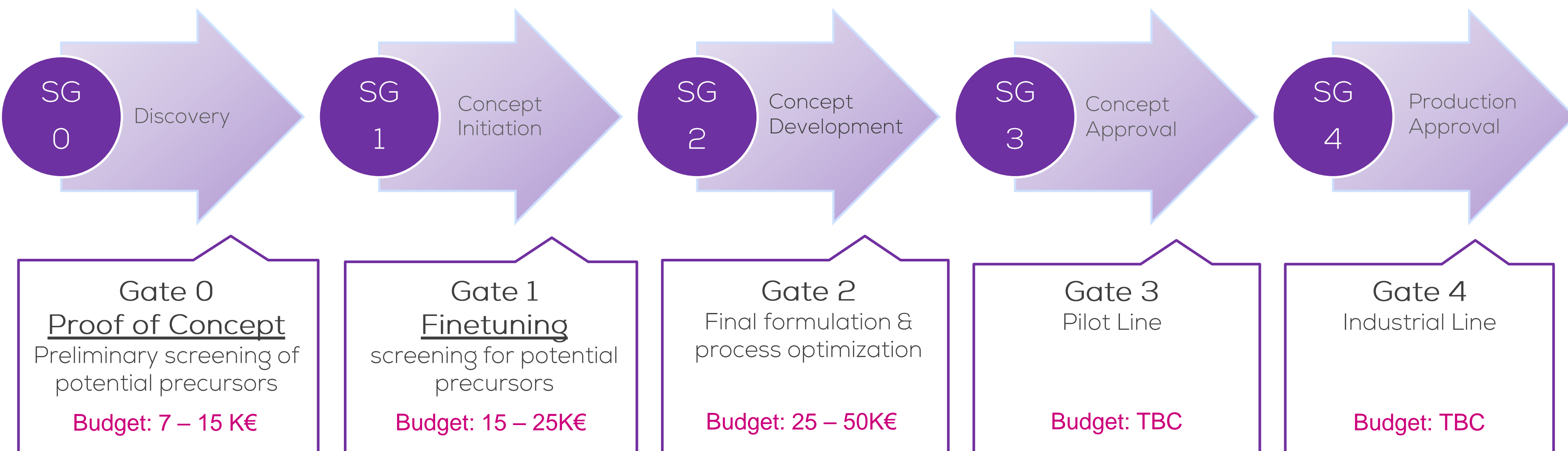
- Stable UV protection
- Tested on several substrates: PC, Glass, etc.
- Tunable

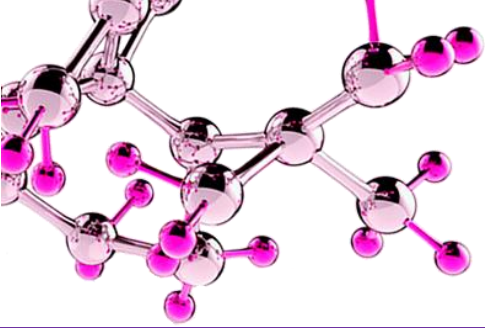




Our Approach

A stage gate process





Our Roots

A successful combination of 2 spin-offs



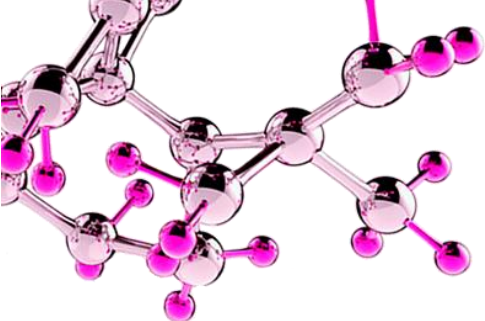
January 2017
Technology transfer
+ 12 patents



License of 1 patent
Development partner

Ownership
3 Investors &
Management





Molecular Plasma Group

Our Core Team



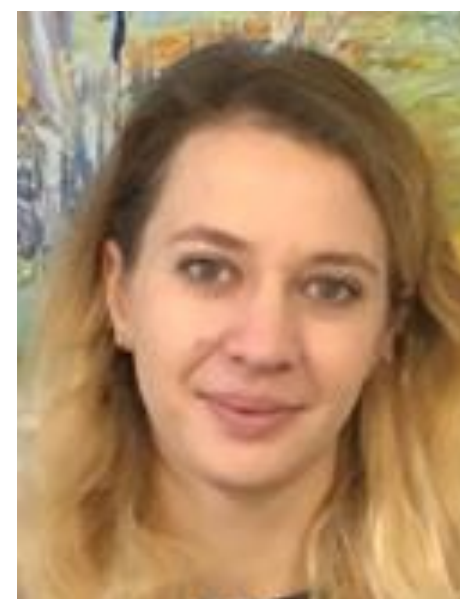
Regis Heyberger
CEO & shareholder

- DUT in Science
- PhD from the University of Strasbourg
- Masters in Quality and Innovation
- Expert in robust upscaling of innovative technologies
- 3 patents



Gill Scheltjens
CTO & shareholder

- PhD in Polymer Science
- Plasma technology expert
- Ex. VITO employee



Joanna Borek-Donten
Principal scientist

- PhD in Chemistry
- Nanotechnology specialist



Jan Vansant
Investor & board member

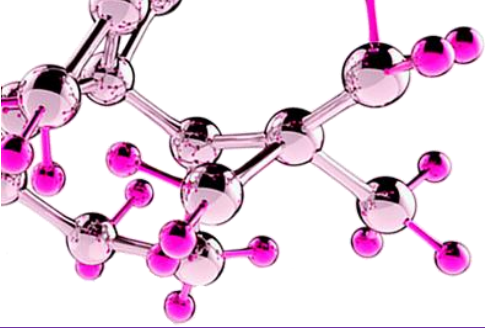
- Experienced entrepreneur
- Innovation expert
- PhD in polymer science and photochemistry
- 26 patents + several publications



Marc Jacobs
Investor & chairman

- Experienced entrepreneur
- Masters in Engineering
- Sloan Masters in Leadership & Strategy from LBS (UK)





Our Key Partners



KU LEUVEN





Book a discovery day

to find out how our
technology can bring
value to you

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LET'S MAKE IT HAPPEN

