

# MULTIFUNCTIONAL MATERIALS AND COATINGS



THE TECHNOLOGICAL ACCELERATOR  
OF RESPONSIBLE INNOVATIONS IN  
MATERIALS AND PROCESSES

## OUR TECHNOLOGIES

### SOL-GEL & Wet Surface Deposition

Use of liquid deposition methods to obtain layers of nanometric and micrometric thicknesses on various substrates to make them multifunctional. The coating process varies depending on whether the surface is flat or three-dimensional.

- **Galvanoplasty – Electroplating,**
- **Sol-Gel Process,**
- **Spraying & Coating of Paint, Varnish, Ink...**

### Dry Surface Deposition

Dry Surface Deposition techniques aim at modifying the surface of an object to improve its properties.

#### • **Vacuum Plasma Deposition PVD or PECVD**

Vacuum Plasma Deposition technologies enable to add a layer or a stack of layers of different types (metal, alloys, oxides, nitrides, carbides, plasma polymer coatings etc.).

#### • **Thermal Sublimation**

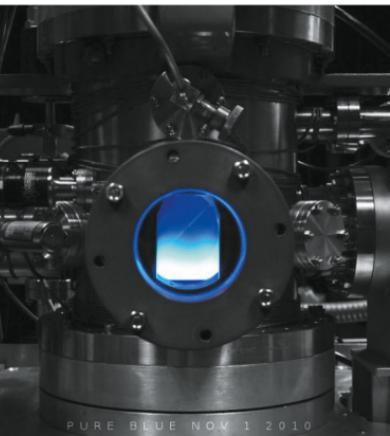
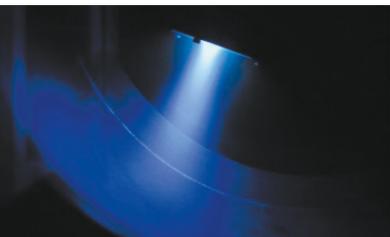
Thermal evaporation is a process performed in a vacuum chamber to deposit thin films on a substrate.

#### • **Atmospheric Plasma Torch Deposition**

Microwave plasma torches generate a plasma outside the torch directly in contact with the substrate to be treated.

#### • **Atomic Layer Deposition (ALD)**

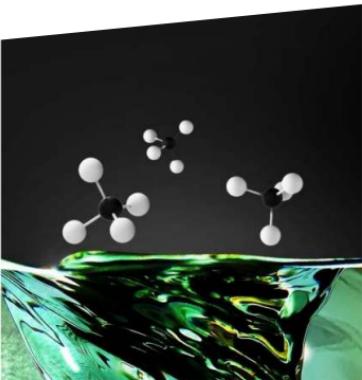
Atomic Layer Deposition (ALD) allows the deposition of atomic layers at low temperatures, the deposition of conformal layers on complex structures with precise thickness control and uniformity at the monolayer level and dense films without defects (pinholes).



## MATERIA NOVA, THE UNIQUE AND ESSENTIAL PARTNER

Controlling the chemical composition of the material, its coating and morphology at the nano and micro scale is key to achieve new outstanding performances and create new opportunities in various sectors as mechanics and metallurgy, transport, health, etc.

The capacity to combine the development of materials and coatings, the engineering of multiple surface treatment processes (to break the limits of nature, size, shape,...) is a major asset that makes Materia Nova the unique and essential innovation partner.



# TO ACHIEVE OUTSTANDING PERFORMANCES



## PROTECTION AND DURABILITY

- Protection against corrosion
- Self-regenerating / self-healing
- Resistance to friction, fatigue, impact, scratch resistance
- Outdoor resistance (atmospheric agents, UV, temperature, humidity, pollutants)
- Barrier (waterproof or permeability)
- Surface cleanliness (easy to clean, self-cleaning, anti-dirt, anti-fingerprint)



## ADHESION AND SLIDING

- Cleaning and surface preparation
- Anti-friction and anti-noise coatings
- Adhesion promoter and/or (in)organic adhesive
- Anti-adhesion, wettability and sliding



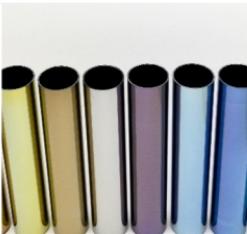
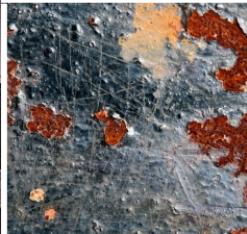
## AESTHETIC PROPERTIES

- Surface coloring
- Luminous surface
- Surface metallization
- Structuring and surface pattern
- Glossy, satin or matt surface



## ELECTRICAL AND ELECTRONIC PROPERTIES

- Modulation of electrical properties
- High durability insulating material
- Piezo and thermoelectric properties
- Conductive thin layers for energy management





## OPTICAL PROPERTIES

- Modulation of optical properties (transmittance, reflectance, absorbance)
- Electrochromic properties
- Phosphorescence and fluorescence
- (Opto)electronic properties



## FIRE RESISTANCE

- Development of environmentally friendly flame retardant for polymer and composite materials
- Formulation of fire-resistant coatings



## CATALYTIC PROPERTIES

- Depollution (catalytic degradation of gas pollutant)
- Self-cleaning by (photo)catalytic thin layers or particles



## ANTIMICROBIAL AND ANTIFOULING PROPERTIES

- Anti-bacterial and anti-viral, anti-fungal properties
- Antifouling properties
- Sterilization thanks to innovative Plasma Technologies



## ABOUT MATERIA NOVA

Materia Nova is recognized as a technological accelerator of sustainable innovations in the field of new materials and processes.

The R&D center offers five different services:

- Materials and Processes conception and innovation
- Equipment Design and Process Upscaling
- Analysis and Characterization
- Life Cycle Thinking
- Project Development and Management

The approach of Materia Nova is based on an open and collaborative innovation.

From the understanding of the problems and requirements of our customers, we jointly select the best scientific and technical solutions which are then tested on a pilot-scale before industrialization. The development and the service provided are always unique and customized and give effective solutions as well as a major competitive advantage to our customers.

## OUR TECHNOLOGIES AND SOLUTIONS

Our expertise in **surface coatings and treatments**, in **polymers and composites** and in **biotechnology** is fertile ground for:

- developing new functional performances of materials,
- taking up the energy and environmental challenges of our society,
- protecting and promoting the health sector.

## OUR STRENGTHS

- A multidisciplinary team of experts
- A wide range of cutting-edge equipment
- An open and collaborative innovation strategy at national and international level
- Innovative projects for and with industrial companies
- Collaborations with R&D centers and universities worldwide
- A strong network of companies, spin offs and start-ups (B-SENS, ESIX, IONICS)

## CONTACT

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