

Innovation with **ALD solutions**

ctechna^o
coating technologies

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Thin-film coatings with Atomic Layer Deposition (ALD)

The advantages of ALD over other thin-film deposition techniques have been conventionally applied mainly in semiconductor electronic industry. But, due to the advances in tools design and recipes development, the significance of ALD is rapidly expanding for producing innovative nanoscale materials.

ALD coatings provide with excellent adhesion and low stress films due to the chemisorption of precursors with the surface, producing:

Perfect Films

Pinhole-free films, even over very large areas. Excellent repeatability. Accurate control of sandwiches, heterostructures, nanolaminates, mixed oxides, graded index layers, and doping.

Perfect 3D conformality

100% coverage over high aspect ratio substrates: uniform coatings on flat, inside pores, and around particle samples.

Challenging Substrates

Gentle deposition process for sensitive substrates (low temperature deposition).

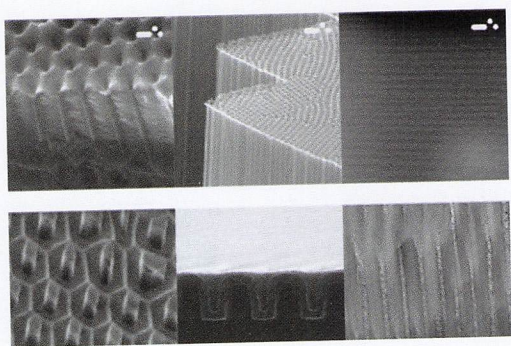
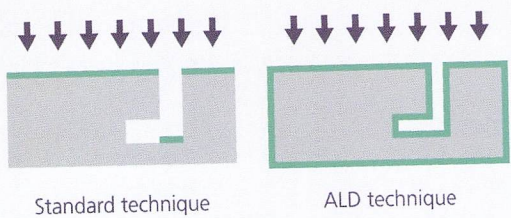


Image courtesy of Mato Knez research group

Custom-made solutions: services and systems

“We work very close to our customers to satisfy their specific needs”

- CTECHnano provides thin-film coating solutions:
- Development of new processes and products.
 - Design and manufacturing of coating tools.
 - Coating services.

We believe on helping customers oriented to innovation, to create new product functionalities or trying to improve their existing processes and products. Our equipment design is adaptable and versatile, to better adjust to the customers needs.

Our R&D system with Adaptable Chamber



Allows changing the chamber volume according to substrate size.

Control console with a user-friendly interface.





Applications and targeted sectors

“Our vision is to provide our customers with ALD knowledge and tools, inspiring novel solutions and applications”

ALD potential applications are highly multidisciplinary. In addition to the electronic industrial-scale solutions already implemented, there are other emerging ones for lighting (e. g. OLEDs encapsulation), energy (e. g. solar photovoltaic cells encapsulation), hybrid materials (e.g. flexible electronics) and optics (e.g. ultra reflective, anti reflective or anti scratch coatings).

Metallurgy, glass, paper and textile industries, decorative coatings, new generation sensors and biosciences, specially in lab-on-a chip tools and biosensors, are also proving to be good candidates to benefit from ALD potentialities.

The limits are in our imagination




Biosciences Sensors Glass Metallurgy
Optics Energy Lighting Electronics

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Vapor Phase Infiltration

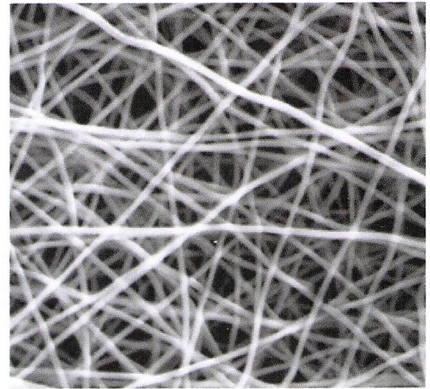
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Vapor Phase Infiltration (VPI)



VPI is a modified version of an ALD process that does not target coating of a material, but rather incorporation of metal ions into a soft substrate, such as a polymer



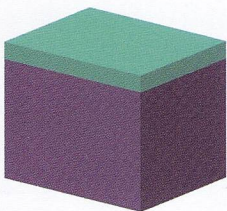
Electrospun Fibers

In contrast to a defined interface between substrate and coating, this process can fabricate material blends often with exciting physical or chemical properties. Depending on the chemical and/or physical characteristics of the chosen substrate and the match with a metal precursor, the mechanical, electronic, catalytic, or optical properties of a polymer can be altered. VPI includes various processing modes and each mode can be further tuned to obtain homogeneous infiltration, gradients of densities, embedded nanoparticles or material blends with controlled ratios of inorganic and polymeric phases. Typical application fields of the resulting materials include mechanical reinforcement of fibrous materials, tuning of electronic conductivities, enhancing of etching resists upon lithographic processes, and many more...



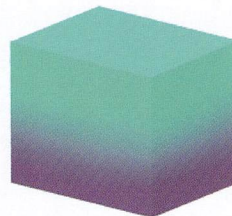
Kevlar Fibers

ALD



No modification
of Rigid Material

VPI



Modification
of Soft Material