

## **Atomic Layer Deposition: a 3D surface engineering technique for nanomaterials**

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This general introduction to atomic layer deposition (ALD) will explain how this technique enables 3D surface engineering on the nanoscale. Since the invention 40 years ago, ALD has attracted researchers from many fields to benefit from its unique properties. Due to the layer-by-layer growth mechanism, thin films can be grown with a thickness down to the subnanometer scale. In addition, an exceptional degree of uniformity and conformality on 3D structures such as fibrous or nanoporous materials and nanosized particles can be achieved. ALD can therefore be considered as an ultimate method for controlling surface properties (adhesion, hydrophobicity), surface functionalization (catalysis) and surface passivation (diffusion barriers, encapsulation, anti-corrosion). Although ALD is a slow technique that often limits the applicability, its future is very promising because the technology is still developing and ALD is taking entrance in fields that are just learning how to take advantage of this 3D surface engineering technique.