

Equipment for Atmospheric, Spatial Atomic Layer Deposition in Roll-to-Roll Processes

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Abstract

Amongst thin-film deposition techniques, Atomic Layer Deposition (ALD) has unique properties like high conformality, high layer quality and thickness control down to Å level. Deposition rate however, is very low in conventional ALD reactors. To achieve high throughput and to reduce costs, there have been recent developments regarding spatial ALD. Whereas in conventional ALD precursors are dosed separated in time, in spatial ALD precursors are dosed simultaneously and continuously at different physical locations. This spatial process can be operated at much higher speeds, limited by layer deposition chemistry rather than pumping times. This has led to the development of high-throughput, industrial-scale ALD tools for surface passivation of crystalline silicon solar cells. A new field of applications is flexible electronics, including system-in-foil, flexible displays, OLEDs and solar cells.

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