



## 45 years of ALD

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Atomic Layer Deposition (ALD) process was devised in 1974 for the manufacturing of thin films with ultra-high dielectric strength needed in electroluminescent flat panel displays. The basic idea in ALD was to affect the structure of the thin film material right in the buildup phase – rather than in possible post-treatment. In the presentation, we discuss the theoretical and practical aspects of controlling material buildup in atomic layers, and the demands of a commercially applicable manufacturing process. We follow the timelines related to the development of the process, machinery, application areas, commercialization, and scientific activities related to ALD. It is often thought that innovations are triggered by scientific findings or fancy ideas. In the case of ALD, the trigger was the identification of a real need and efforts to an in-depth understanding of the problem. Significant scientific activities on ALD and the related surface chemistry were activated first the practical value of the process had been proven. ALD is an example of long-term developments behind the fast technical progress seen in monthly or weekly renewing models of mobile phones, computers, and many other products.