

Atomic-Layer-Deposition (ALD)



The full-fledged research atomic-layer-deposition (ALD) system, model Picosun SUNALE R-200 Advanced, is featuring a hot wall reactor for temperatures of up to 500 °C, an ozone generator, a plasma generator as well as the capability to handle three liquid and three solid precursor materials at the same time. The “Picoflow” mode allows for coating of highly irregular surfaces with high aspect ratios of up to 1:2000. A powder holder enables coating of micropowders. Sensitive samples can be handled in an argon filled glove-box and loaded into the process chamber through a load-lock. For this purpose the carrier gas can be switched from N₂ to Ar.



Contact

See KNMF website or contact the KNMF User Office.

Features

- conformal 3D coatings (maximum aspect ratio 1:2000)
- 2D thin films
- multilayers
- graded coatings, powder coatings
- ALD is attached to an argon filled glove-box
- Process gasses:
 - N₂ or Ar as carrier gas / purge gas
 - H₂O / O₃ for thermal / ozone assisted ALD
 - NH₃ for thermal ALD of nitrides
 - N₂, O₂, H₂/Ar (5/95), H₂/N₂ (5/95), H₂/Ar (5/95) gases for plasma assisted ALD processes
- Processes available: Al₂O₃ and AlN, TiO₂ and TiN, TaN, HfO₂, SiO₂, Ag, Nb₂O₅

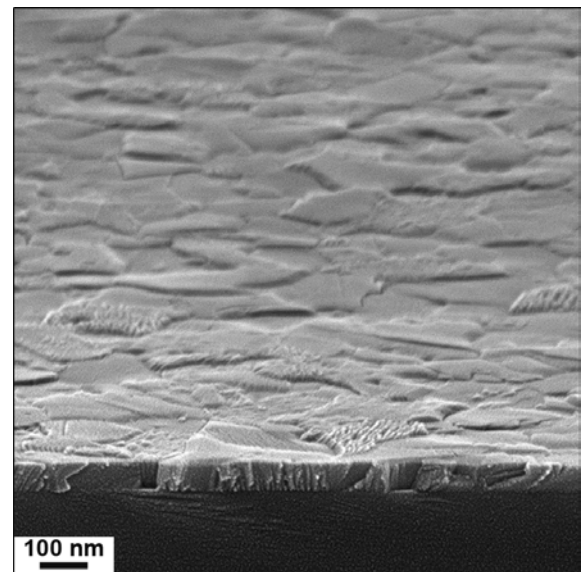
Design rules

- Max. sample height 15 mm
- Max. diameter 200 mm (8" Si-Wafer)
- Max. 28 cm³ volume for powder coatings (max. 300 m²/g specific surface area)

Materials

metals, ceramics, nitrides

Typical structure



SEM image of an approx. 75 nm thick TiO₂ thin film coating on a (100)-oriented Si-Wafer