



Advanced materials deposition

AltaCVD performs MOCVD, PECVD and ALD of complex material systems at the nanometer scale: high-*k*, noble and refractory metals, metal oxides, binary and ternary alloys, laminates.

Features

- 100-200 mm or 200-300 mm version
- Direct liquid injection of precursors with advanced vaporization system
- Wide spectrum of deposited materials through a wide range of vaporization - up to 280°C - and deposition temperatures - up to 650°C
- Thermal CVD or RF-enhanced deposition (PECVD and PEALD)
- Low-frequency plasma available for tuning materials' mechanical/electrical/optical properties

Specifications

Process performances are application-dependent, however generic specifications are given below:

- **Within-wafer thickness uniformity:** < 1%, 1 sigma, 3 mm edge exclusion (200 mm)
- **Added particles:** < 15 @ 0.16 μm , 3 mm EE
- **Deposition rate:** from 0.2 nm/min to a few 100 nm/min depending on application requirements and process settings



Technology

- Standalone chamber or cluster tool capability with industry standard vacuum handling platform
- Up to three chambers on one platform (150-200 mm or 200-300 mm)
- Low chamber volume for compatibility with ALD
- Proprietary gas-distribution system design for enhanced process performance and repeatability
- Pulsed injection and vaporization of up to four liquid or diluted solid precursors
- Non-contact and high-residence time vaporization for efficient and residue-free vapor formation
- Up to 12 reactive gases
- Uniform substrate heating (< 1%) up to 650°C through the use of a resistive heater
- 13.56 MHz RF generator for plasma-enhanced deposition
- 300-500 kHz RF generator for ion-bombardment control
- Automated liquid and gas delivery systems
- Proprietary PLC control software and user interface

Applications

- High-*k* gate dielectrics
- Metal gate electrodes
- 3D integration: TSV dielectric liner, barrier/seed or seedless barrier deposition
- New non-volatile memory concepts (PCRAM, ReRAM, FeRAM)
- Capacitor (MIM, DRAM, eDRAM) coupling dielectrics
- Capacitor (MIM, DRAM, eDRAM) electrodes
- Advanced materials for microsystems
- Thin-film batteries



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200