NorthStar ALD System

- The NorthStar Atomic Layer Deposition (ALD) system is a versatile research deposition tool for thermal or energy enhanced ALD
- With up to 8 precursor lines and a hot wall deposition chamber, a wide range of applications may be performed by a single system
- Sample introduction is rapid and convenient with a quick hatch or the optional load lock
- The NorthStar ALD system can be interfaced with other deposition and metrology tools
- Integration of in-situ metrology tools and the RoboALD™ software/system automation increases process reproducibility
- Fully UHV Upgradable
- Demo and deposition services available

Applications

- High-k Dielectrics
- Nanocoatings
- MEMS
- Photonic Crystals
- Diffusion Barriers
- Device Encapsulations
- Surface Modification Layers

SVT Associates, Inc.

- Leading manufacturer of thin film deposition equipment since 1993
- In-house laboratory for materials research and process development
- Established a diverse range of deposition components, systems, integrated sensors, and process control
- Developed strong combination of equipment manufacturing and process know-how
- Seven Applications Laboratory deposition systems producing world class materials
- Diverse system product line spanning the thin film deposition market
- Leading supplier with over 190 systems in the field
Specifications Model ALD-P-200B

**ALD REACTOR MODULE**

**Reactor Chamber**
- Up to 8" (200 mm) Wafer Capacity (Optional 300 mm)
- Hot Wall Chamber Design – Temperature Controlled
- Three Gas Inlet Injection Ports
- (Two for Precursor Manifolds and One for Gas Inlet)
- Close Coupled Sample Heater to 500°C
- Load Lock Flange, Pumping Port
- Provision for Quartz Crystal Monitoring and RGA

**Reactor Pumping**
- Dual Stage Rotary Vane Pump – 7 cfm (200 l/min)
- Heated Pumping Line Isolated with Valve
- (Optional Hot trap, Particle Filter, and Cold Trap in Pumping Line)
- Other Pumping Options Available

**Base Pressure**
- <1 x 10⁻³ Torr or better

**Vacuum Gauge**
- Convectron® Gauge

**Electronics**
- Control Electronics
- Sample Heater Power Supply and Controller
- Chamber walls Heater Power Supply, Thermocouple and Temperature Controller
- Gas Line Heater Power Supply, Thermocouple and Temperature Controller

**ALD Console**
- Clean Room Compatible Metal Enclosure

**PRECURSOR MANIFOLD(S)**

**Carrier Gas Line**
- One for Each Manifold (Typically N₂)
- Mass Flow Control

**Precursor Admission**
- Precursor sources from Liquid, Solid, or Gas phase
- Heated Precursor Manifolds with up to 4 Precursors
- Each (Option for second Manifold for up to 8 Precursors)
- Fast ALD High Temp Valves (15 msec)
- Metal VCR® fittings
- Gas Line Heating to 200°C

**PROCESS CONTROL**

**Robo-ALD™**
- Software and Firmware – PLC
- Based on NI LabVIEW® platform
- Recipe Entry and Operation Loops
- Logging of parameters – T, P, Flow, (Optional RGA)
- Log files can be exported to Excel®
- Automated pumpdown / vent to atmosphere

**Deposition Uniformity**
- < ±1 % over 200 mm – Reference – Al₂O₃, thickness > 20 nm

**Deposition Mode**
- Standard, or “soak” mode for high aspect ratio samples

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**LOAD LOCK (OPTIONAL)**

**Load Lock Chamber**
- Sizes available up to 300 mm Wafer Capacity
- Manual Gate Valve

**Safety**
- Software safety interlocks
- Smoke detector in cabinet
- Low voltage Emergency Off (EMO)
- Single point power connection

**EXTERNAL SERVICES**

**Electrical Service**
- 220/380 VAC, 50A, Single or Three Phase, 50-60 Hz

**COMPRESSED AIR/N₂/Ar**

**Valve Manifold**
- 75 PSI CDA at 0.1 cfm (500 kPa at 2.8 liter/min) pressure regulated
- Relative humidity < 20% Dry N₂ may be substituted

**Carrier Gas**
- 5 PSI (35 kPa) Research Grade N₂ or Ar
- Also used to vent reactor

**Exhaust**
- Vacuum pump and Cabinet

**COOLING WATER**

**Reactor Chamber**
- 2 l/minute at approx. 20 °C, or a water chiller when inner chamber wall is run >150 °C