

Ion Beam Technology

Ion Beam Sputter Deposition

Ion Beam Sputter Deposition (IBSD)

Reactive Ion Beam Sputter Deposition (RIBSD)



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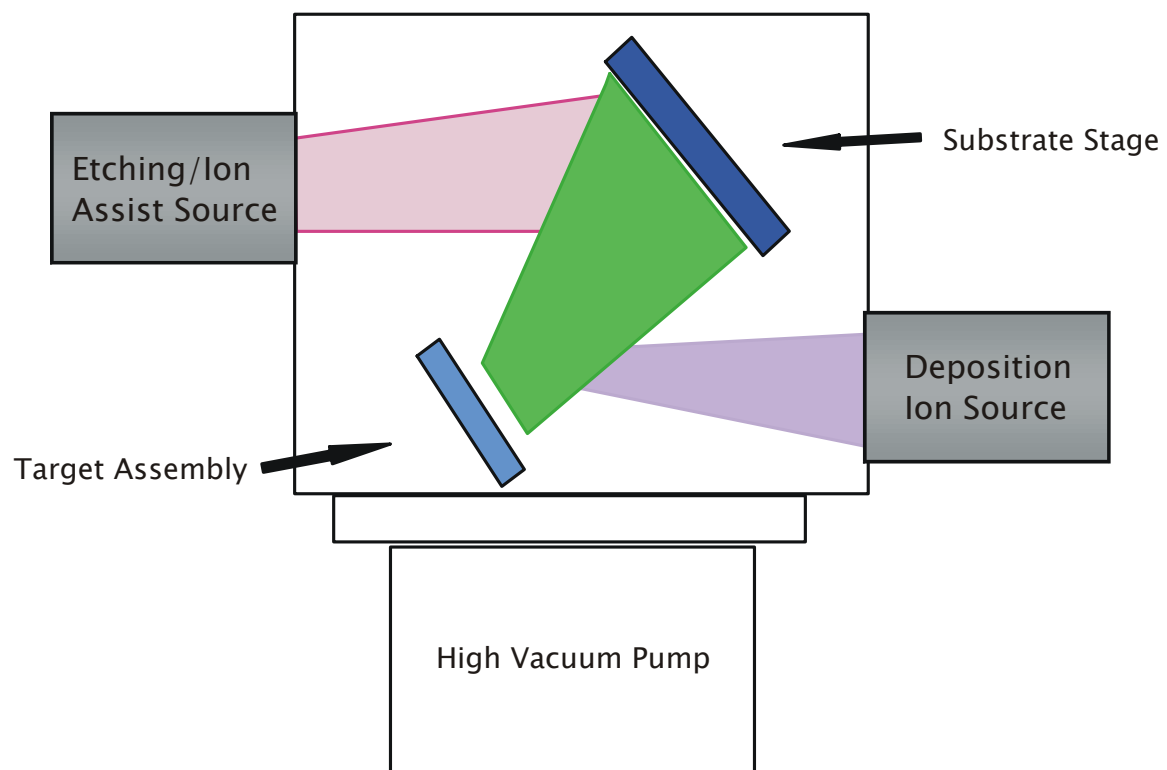
Ion Beam Sputter Deposition (IBSD)

- ◆ **High-End Thin Film Deposition Process**
- ◆ **Lower Pressure Sputter Deposition (10^{-4} Torr), Sputtered Atoms Retain Kinetic Energy Due to Minimal Scattering in Low Pressure Environments**
- ◆ **High Quality, Smooth, Pin Hole Free Films**
- ◆ **Enhanced Adhesion and Micro-structure Control**
- ◆ **Yields Excellent Coverage at Small Thicknesses and on High Aspect Ratio Features**
- ◆ **Independent Control of Ion Beam Parameters Allows User to Engineer Film for Desired Properties**
- ◆ **Low energy ion assist with end-Hall ion sources**
- ◆ **Typically, Film Properties from Ion Beam Deposition Exceed those Deposited by Evaporation or Magnetron Sputtering**



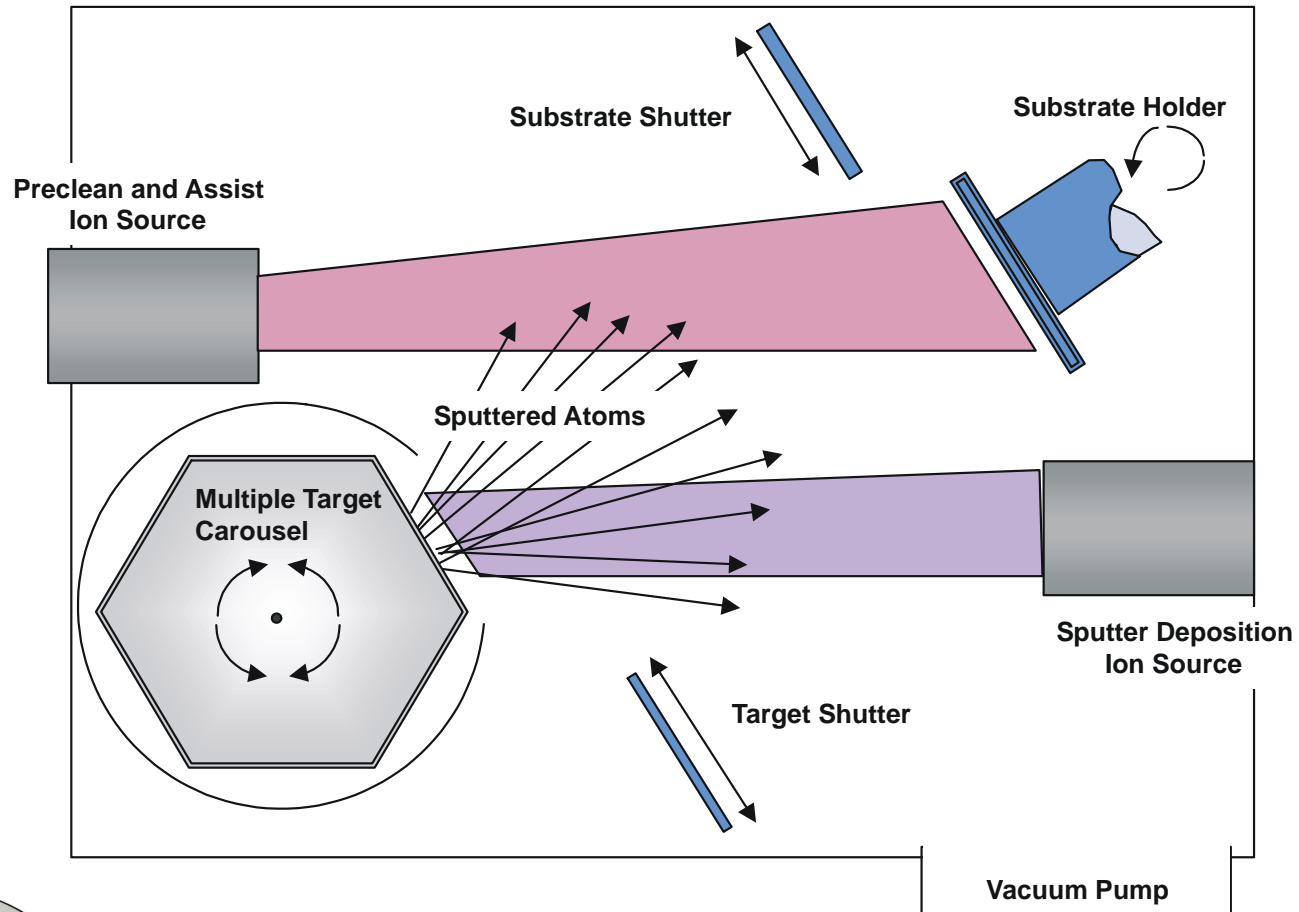
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Typical Dual Ion Beam System Configuration



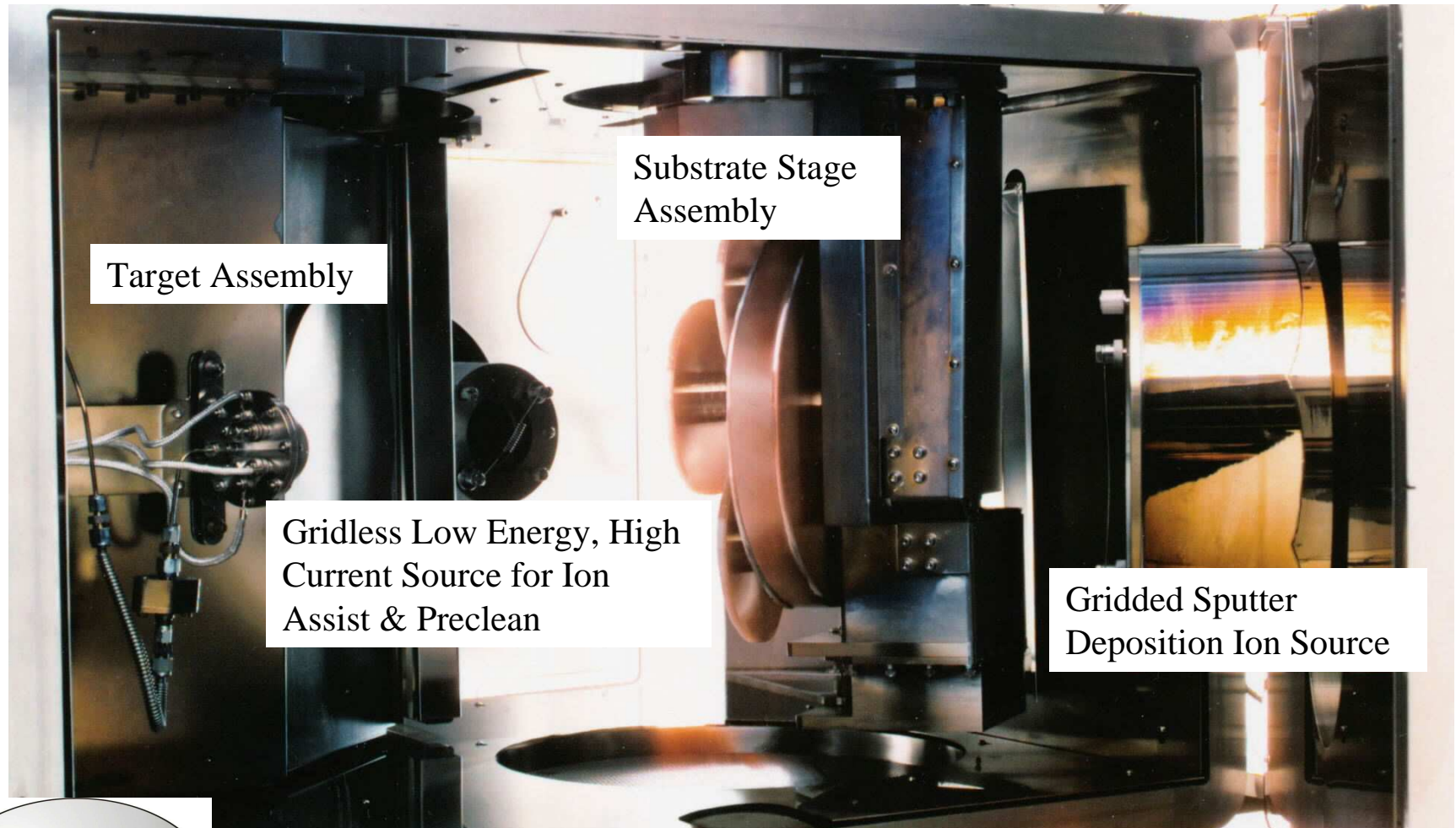
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Typical Ion Beam Sputter Deposition System with ion beam assisted deposition capability for Cluster Tool Configuration



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Ion Beam Sputter Deposition with Gridless End Hall Ion Assist Source



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Ion Beam Sputter Deposition Applications

Device / Process

Superconductors
Thin Film Heads
Optical Thin Films
Ring Laser Gyro Mirrors
Dielectric Films
Encapsulation Films
Anti-reflection Coatings
Interconnect Films
Sensors
Advanced Magnetic Heads
Semiconductor
X-ray Optics
Laser Facets
High Reflectance Mirrors
Divisional Wave Multiplexers
Laser coatings

Materials

YBaCuOx, LaSrTiOx
NiFe, CrCo
Al₂O₃, Ta₂O₅, TiO₂, SiO₂
Multilayer SiO₂/TiO₂
SiO₂, TiO₂, AlN, etc.
Si₃N₄, Al₂O₃
MgF₂, SiO₂, Ta₂O₅, TiO₂
W, Au, Cu
Composites or Alloys
NiFe, Ta, Cu, Co, FeMn
Si₃N₄, DLC
W, Cu, Mo, Si, B4C, Ni, C
Si₃N₄, SiO₂, Al₂O₃, Si
Refractory Oxides, Si
Refractory Oxides, Si
Nb₂O₅, Ta₂O₅, HfO₂, SiO₂



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