scia systems

LARGE AREA COATING AND ETCHING

scia Cube 300

Features & Benefits

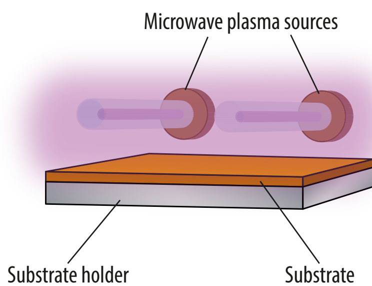
- Large area processing with an array of synchronized linear microwave sources
- Independent RF bias at substrate holder for energetic substrate bombardment
- Substrate cooling (-10 °C) or heating (850 °C)
- In-situ chamber cleaning process

Applications

- PECVD Processes
  - Deposition of dielectric films, e.g. encapsulation, barrier coatings, electric insulation (SiO_2, Si_3N_4, …)
  - Optical and scratch resistant coatings (a-C:H, DLC)
  - Growing of nano-crystalline diamond and carbon nanotubes
- RIE Processes
  - Reactive etching and structuring of metals (Ni, Cr, Pt, …)
  - Etching of gratings and other structures in optical materials (quartz, fused silica)
  - Ashing of photoresist

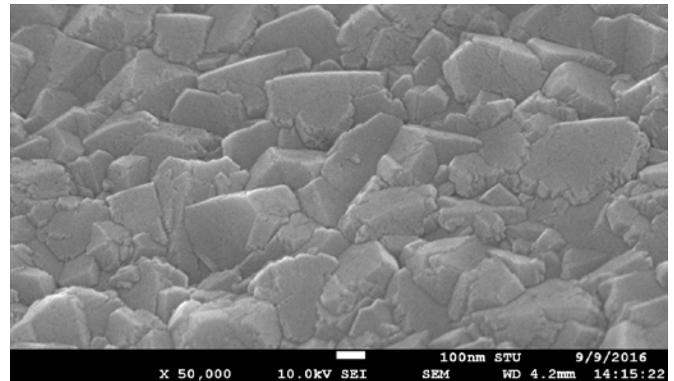
Principle

- Plasma Enhanced Chemical Vapor Deposition (PECVD) and Reactive Ion Etching (RIE)
  - Plasma of reactive gases is created by microwave sources
  - Enhanced ion bombardment with RF bias



Application Example

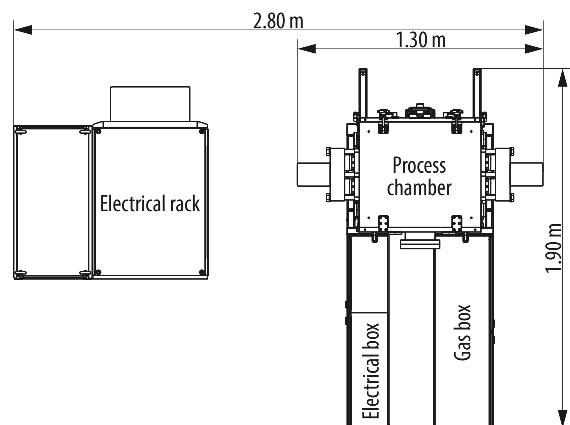
- Growth of boron doped diamond (BDD)
  - Processing at very low temperature (390 °C)
  - Growth rate of high-quality BDD up to 70 nm/h



SEM image of synthesized BDD layers with courtesy of STU Bratislava

Technical Data

Substrate size (up to)	300 mm x 200 mm
Substrate holder	Water-cooled, RF bias
Substrate temperature	Alternatively cryo-cooling down to -10 °C or heating up to 850 °C
Plasma sources	2 linear microwave sources (PL400) and/or RF parallel plate arrangement, 13.56 MHz
Typical deposition rates	Diamond: 30 … 70 nm/h, DLC: 7.5 nm/min
Power supply	MW power: max. 9 kW, RF power: max. 0.6 kW
Base pressure	< 1 x 10^{-6} mbar
System dimension (W x D x H)	1.30 m x 1.90 m x 1.50 m (without electrical rack and pumps)
Configurations	Single chamber, optional single substrate load lock
Software interfaces	SECS II / GEM, OPC



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