DIAMOND LIKE CARBON COATINGS

DLC PROCESSES FOR 3-5µm AND 8-12µm INSIDE YOUR BAK
THE NEW WAY TO MAKE DLC COATINGS
Evatec brings conventional PVD and PECVD processes together within the same system to enable high performance protected AR coatings on Si or Ge.

REDUCE YOUR MANUFACTURING COSTS FOR HIGH PERFORMANCE IR COATINGS
PVD and PECVD processes can now be brought together in the BAK platform. Save time and costs in the coating of DLC type layers used to protect thermal imaging and guidance systems for high performance consumer, industrial and military applications.
- Eliminate the vacuum break required between conventional PVD and PECVD processes
- Coat the whole batch of optics together for best process repeatability
- Low temperature processing <150°C (compared with 300-600°C for conventional DLC processes) to prevent substrate damage
- Reduce the number of manufacturing steps - eliminating the need for an additional DLC tool and saving cleanroom space

**Step 1: PVD Process(es)**
Multilayer stack deposition for high performance AR coatings using Evatec digital e gun technology

**Step 2: PECVD**
Deposition of hydrogens containing carbon films of controlled refractive index using proprietary plasma source technology

**Process Control**
Combination of quartz and broadband optical monitoring for layer end point termination with “in situ” direct measurement of optical properties

**TYPICAL BAK1101 TOOL SET UP**
- Throw distance approx. 1000mm
- 2 x Digital E-Gun ESQ212
- 4 x Quartz front side heaters
- Proprietary plasma source
- Enhanced gas throughput vacuum pumping system. DLC process in range $10^{-4}$ to $10^{-3}$ mbar
- 4 MFCs for process gases
- Integrated quartz and optical thickness monitoring

**WANT TO KNOW MORE**
For more information contact your local Evatec sales office or visit us online at:
www.evatecnet.com/markets/precision-optics

CONTROLLING THE DEPOSITION PROCESS

DLC is not one material but refers to a whole class of amorphous hydrogen containing carbon materials with various degrees of cross linking, hydrogen content and stress. Evatec processes technology delivers films with a hybridisation between sp² and sp³ in the range 0.07 to 0.72 at H contents of around 40at%.

**TAKE A LOOK AT THE RESULTS**

**TYPICAL FILM PROPERTIES**
- Film Hardness: >20 GPa
- Intrinsic stress: <100MPa
- Refractive index : 1.67
- Compatibility: “Bio & Blood” (stable against acids & alkalis)
- Environmental & durability performance tested according to UK military tests TS1888 (water/sand wiper TS)