CARBON GUN

The Manufacturing Solution For Ultrathin Carbon Overcoats

- **PECVD process for wear and corrosion protection with layer thicknesses below 5 nm**
- **Thickness uniformity £ 5 %**
- **Carbon deposition rate up to 2.5nm/s proportional to acetylene flow**
- **Fully integrated in-situ oxygen plasma cleaning to prevent particle generation**
- **Available for CIRCULUS M12 and M14 systems**

Process Information

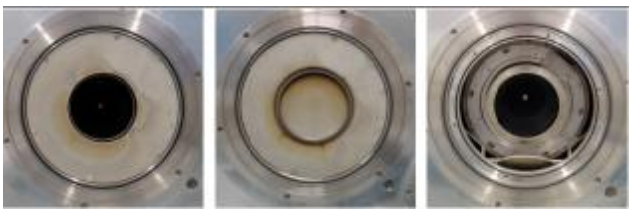
- Coupled capacitor RF discharge at 27MHz
- Carbon deposition by using Acetylene (C_2H_2) as process gas
- Inherent homogeneous neutralization of beam (substrate not part of RF circuit)
- Ion acceleration by RF self bias (approx. 100 eV per C-atom)
- Magnetically enhanced discharge at operating pressure of $8x10^{-4}$ to $4x10^{-3}$ mbar

Film Properties

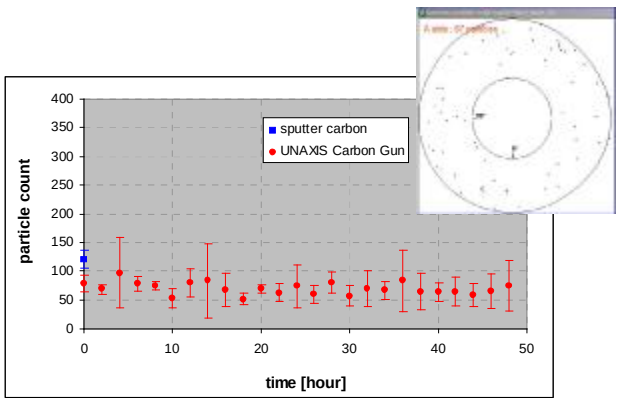
Thickness uniformity	± 5% (FF95 disk)
sp^3 content	55 - 60 %
Hydrogen content	25 - 30 %
Density	2.4 g/cm³ (RT) 2.1 g/cm³ (200°C)
Roughness	≈ 0.12 nm
AFM Scratch resistance	2.7 times higher than CNx films

Integrated Oxygen Cleaning

- In-situ oxygen plasma cleaning (ashing) prevents particle generation throughout the system
- Isolated Carbon Gun cleaning cycle prevents oxygen contamination throughout the system



Carbon deposition | Oxygen cleaning | Removed shielding



Candela particle measurement during 48h long run test (24 480 cycles) (courtesy Ming Yang, HGST)

www.datastorage.unaxis.com