

Advantages of ATF IBS Coatings:

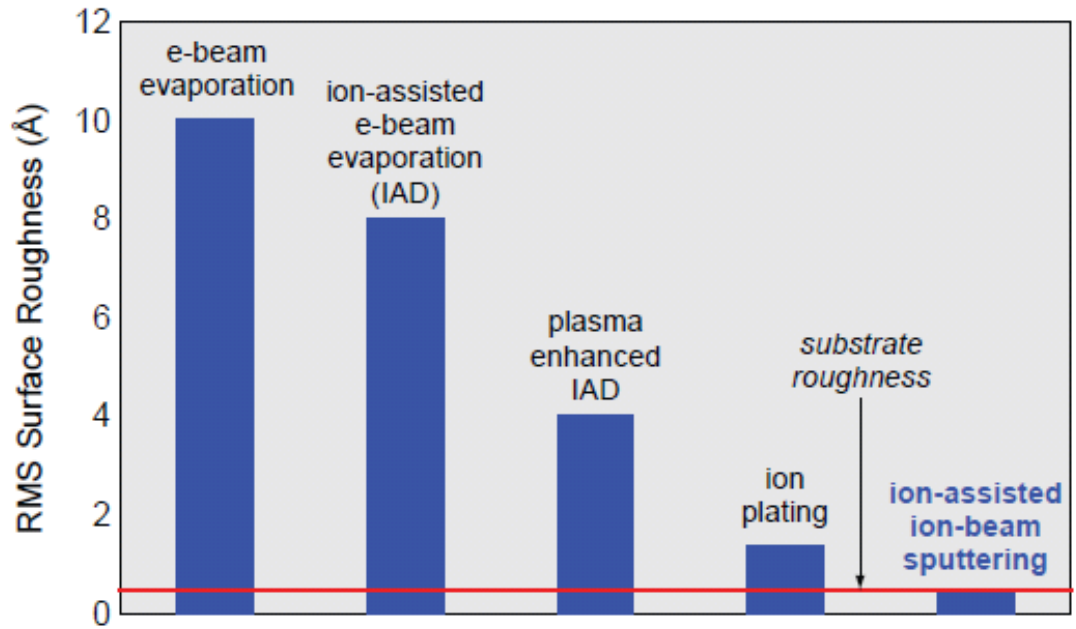
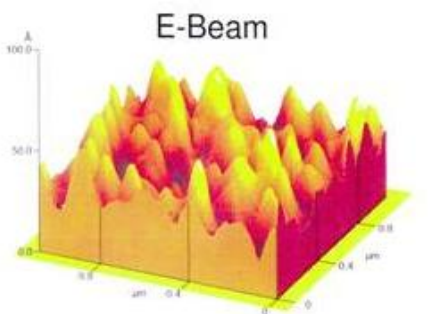
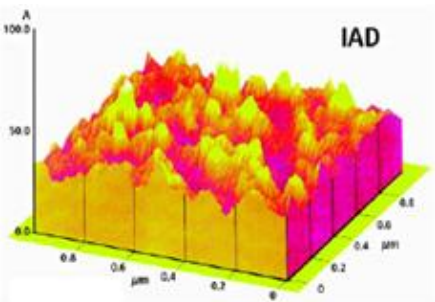
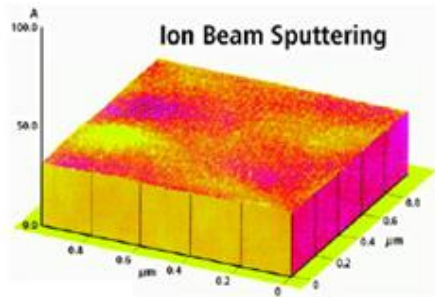


- High damage thresholds $> 70\text{J}/\text{cm}^2$
- Tight tolerances:
 - $\text{AR} \leq 0.01\%$ for single wavelength
 - $\text{HR} > 99.999\%$
- No moisture shifts
- Excellent durability
- Absorption $< 1\text{ppm}$
- Covering 260 nm to 3000 nm

COATING COMPARISON

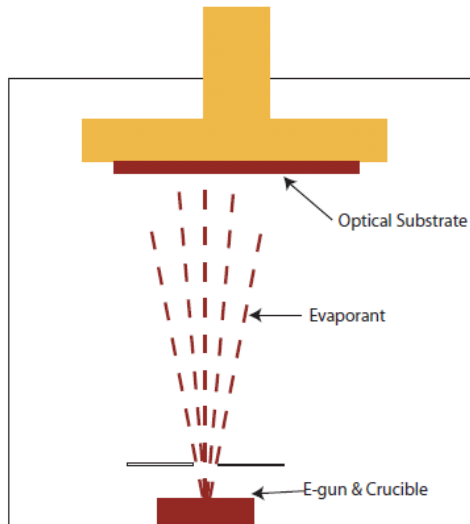
	Electron beam evaporation	Ion Assisted Deposition	Magnetron Sputtering	Ion Beam Sputtering
Cost	\$	\$\$	\$ - \$\$	\$\$-\$\$\$
LDT (1064 HR, 20ns 20 Hz)	~ 5 to 30 J/cm ²	~ 5 to 30J/cm ²	~ 10 J/cm ²	>70 J/cm²
Absorption	Up to 100 ppm	>50-100ppm	~10ppm	<1 ppm
Number of Layers	1-50	~50	~50-100	>200
Surface Roughness / Scatter	+10Å RMS	+8Å RMS	< 5Å RMS	< 1Å RMS (conformal)
Density / Porosity	Porous	Dense	Near bulk	Near bulk
Adhesion / Durability	Low	Good	Very good	Excellent
Humidity Sensitivity	Yes	Yes, small	No	No
Aging Effects	Yes	Yes, small	No	No
Intrinsic Stress	< 100MPa	~100MPa	few 100MPa	few 100MPa
Wavelength Range	193nm-10000nm	200nm-10000nm	250-3000nm	250-3000nm

Surface Micro-Roughness

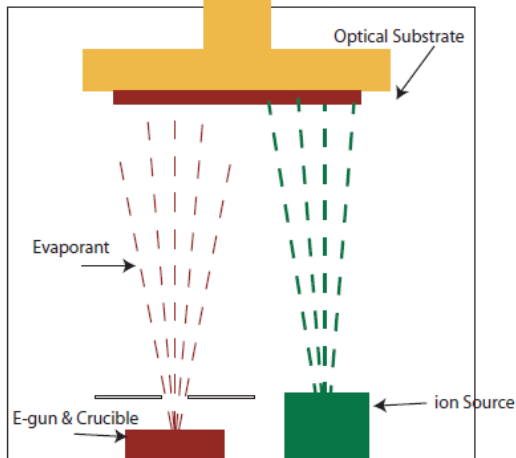


[1] "Optical Morphology: Just How Smooth Is That Surface?,"
C. Langhorn and A. Howe, *Photonics Spectra* (Laurin Publishing),
June 1998.

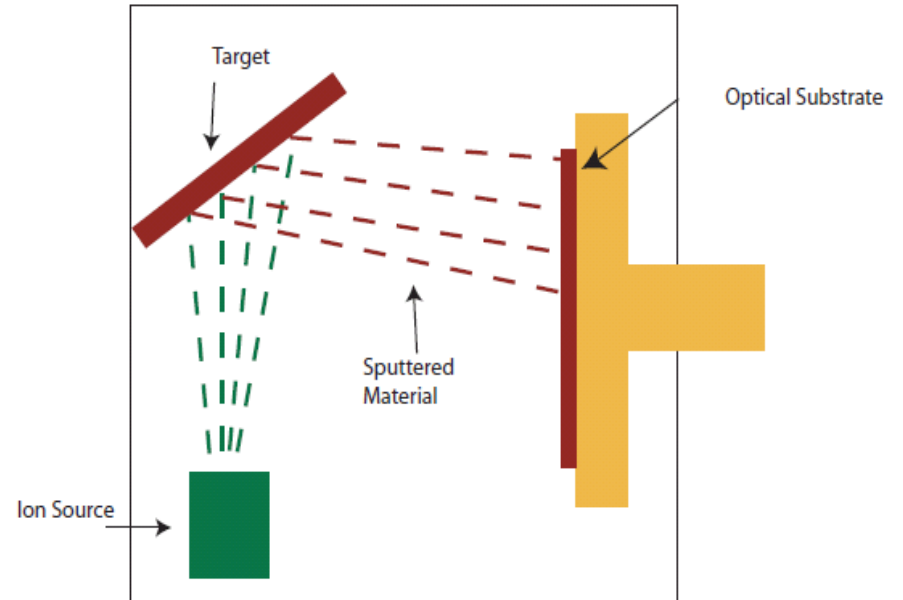
Electron beam evaporation



Ion Assisted Deposition (IAD)



Ion Beam Sputtering (IBS)



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