

Ion Beam Sputtering

Our Sputtering machine is a Dual Ion Beam Deposition system equipped with fully automated, state of the art, software control. It is equipped with two RF powered ion sources and three target materials allowing the production of the most complex of coatings.

Film deposition is achieved using the 16cm diameter RF ion source. This source is highly energetic and therefore generates films with excellent adhesion and high packing density. The 12cm diameter RF assist source is focused on the substrate and primarily serves to correct film stoichiometry and alleviate stress. Together these two sources operate in unison to produce films with optimal optical and physical properties.

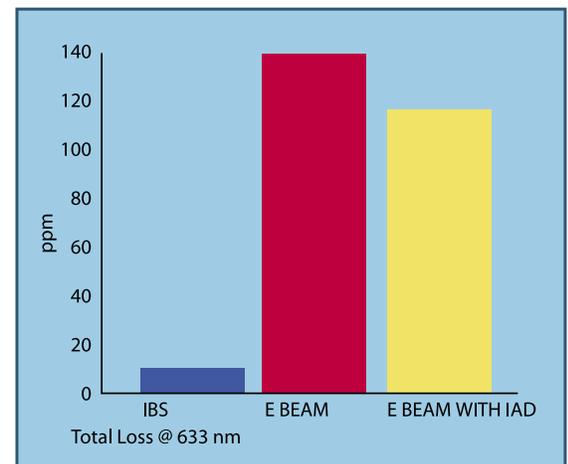
Surface Roughness

Rough surfaces typically indicate a higher degree of columnar growth and growth nuclei. Smooth surfaces tend to have a characteristic dense microstructure and low defect density. Ion Beam Sputtering produces extremely smooth films as compared to electron beam deposition and/or ion assist.

Due to the high energy of sputtered atoms, Ion Beam Sputtered films have a high density very similar to the bulk density of the target materials used. This high density is consistently reproducible run to run.

An Important feature of an optical coating is its surface quality. The quality of the surface determines the performance of the optical device itself. High quality optical coatings start with a smooth super-polished optical substrate with roughness typically in the order of 0.05 nm rms. A conventionally deposited film will add roughness to the surface of the optical substrate, the degree of the roughness dependant upon the technique used. For example a film deposited by evaporative techniques produces a surface roughness of 1 nm rms typical, while ion assisted deposition techniques produce a surface roughness of 0.4 nm rms typical. Ion beam sputter deposition adds very little or no roughness of its own, producing films with a surface roughness equal to that of the super-polished substrate, 0.05 nm rms.

The IBS is operated in a temperature and humidity controlled, clean room environment.



www.spectrumthinfilms.com

e-mail: info@spectrumthinfilms.com



100-E Knickerbocker Avenue, Bohemia, NY 11716
• TEL 631-589-3502 • FAX 631-589-3514
• Toll free No. 1-800-815-8184

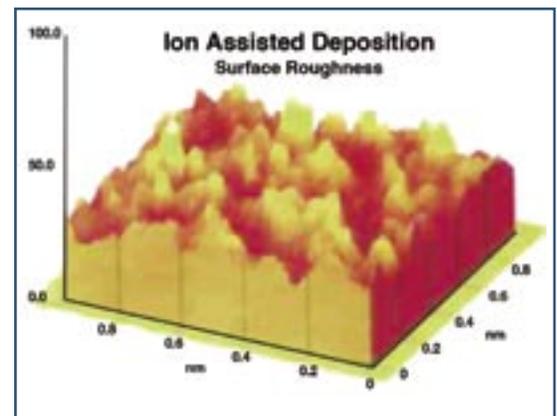
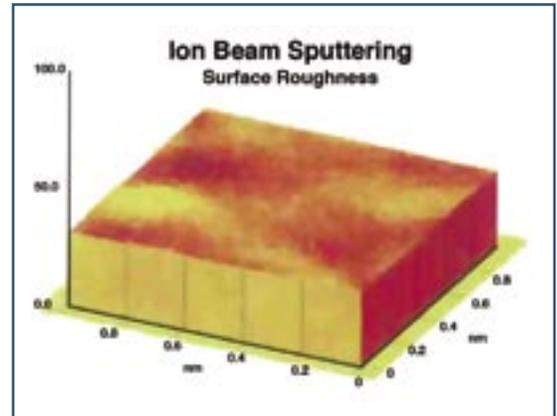
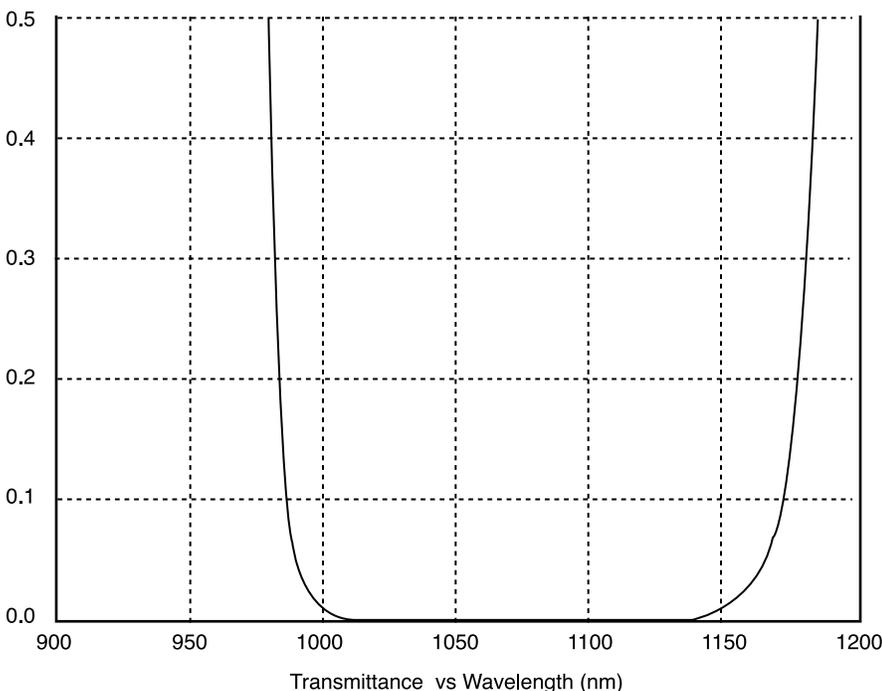
Ion Beam Sputtering

WHY IBS?

- Ultra low loss coatings where very low scattering is needed. Dielectric coatings with reflections greater than 99.99% can be achieved. We also offer in-house and custom designed tooling.
- The fully computer controlled IBS system maintains precise layer matching, producing the most complex coating designs conceivable. The IBS system can produce complex non-quarter wave coatings with absorption and scatter ppm levels down to single digit.
- The IBS system pushes the envelope of manufacturing capabilities and permitting the most rigorous optical coating specification to be achieved. Many advanced applications requiring ultra low loss and ultra high precision can only be achieved using this IBS system.

This IBS unit is a proprietary system, designed for extreme uniformity and high capacity. This high capacity allows for more parts per run and a lower cost to you.

Illuminant :	White	Angle:	0.0 (deg)
Medium:	Air	Reference:	1064.0 (nm)
Substrate:	FQTZ	Polarization:	Ave —
Exit:	FQTZ	First Surface:	Front
Detector:	Ideal	Remark:	High Power Ultra Low Loss Laser Mirror



100-E Knickerbocker Avenue, Bohemia, NY 11716
TEL 631-589-3502 • FAX 631-589-3514
Toll free No. 1-800-815-8184
www.spectrumthinfilms.com