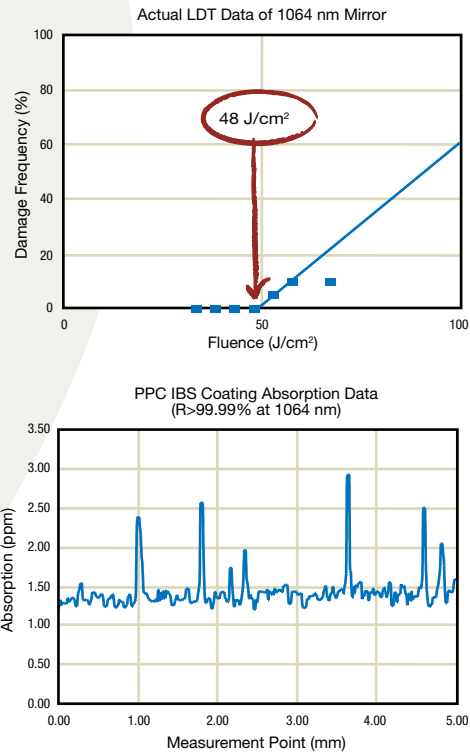


# Why Choose PPC Coatings?

At PPC, our advanced ion-beam sputtering (IBS) technology is a repeatable and controllable process that results in dense, durable, high-damage-threshold thin films. Since the materials are directly sputtered onto the substrate, the process are precisely controlled and easily automated so that films are deposited with extremely high accuracy and repeatability.

Unlike conventional evaporative and ion-assisted films that have porous microstructures, IBS films have densely packed structures that make them impervious to water vapor. Consequently, our IBS coatings are completely insensitive to changes in environmental conditions such as heat, humidity and pressure.

In addition to a variety of off-the-shelf laser optics, PPC offers custom high-energy UV to MWIR coating design and manufacturing from 250 nm to 5 microns. Custom IBS coatings can be done on customer supplied materials or we can provide you with complete finished optics in as little as 48 hours!



## Advantages of Our Ion-Beam-Sputtered (IBS) Dielectric Thin Films

- Durable coatings are easy to clean and chemically resistant
- Dense and non-porous structure is insensitive to moisture and other environmental factors
- Superior adhesion eliminates delamination
- Low scatter and absorption losses result in high damage thresholds and long lifetimes
- Repeatable, highly controlled process for precise layer control

### Coatings Comparison

	Electron Beam Evaporation	Ion Assisted Deposition	Magnetron Sputtering	PPC's Ion Beam Sputtering
Deposition Rate	>10 Å/sec	~10 Å/sec	~10 Å/sec	~3 Å/sec
Laser Damage Threshold (1064 HR)	~5 to 30 J/cm², 20 ns	~5 to 30 J/cm², 20 ns	~10 J/cm², 20 ns	>40 J/cm², 20 ns
Absorption	>100 ppm	>50 ppm	10 ppm	<2 ppm
Thermal Conductivity	Low	Medium	High	High
Number of Layers	1-50	~50	~50-100	200
Surface Micro-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	<100 MPa	~100 MPa	Yes, few 100 MPa	Yes, few 100 MPa, reproducible

\* These values are typical values indicative of average industry standards. They in no way represent a specific supplier other than Precision Photonics and exceptions may exist.

### Coating Types

- High reflectors
- Anti-reflection (ARs)
- Beamsplitters
- Polarizers
- Partial reflectors
- Dichroic mirrors
- Non-polarizers
- Low dispersion
- Broadband dielectric