

IBS Coating

The ion beam sputtering (IBS) coating process is used in highly demanding coatings. Like no other technology, the process parameters, such as energy input, layer growth rate, and level of oxidation, can be exactly and independently set. The desired layer structures can be produced very precisely and with a high reproducibility.

In the IBS process, precious gas ions are shot at the coating material. The ions strike and disperse the coating material, which is then deposited on the substrate to be coated.

Due to their high amount of kinetic energy, the incoming particles are very agile, fill in voids, and circumvent possible defects in the growing film. This results in extremely smooth and particularly homogeneous layers in terms of optical properties.

Water cannot collect in these dense and compact layers, which leads to drift-free coatings that are not sensitive to temperature changes.

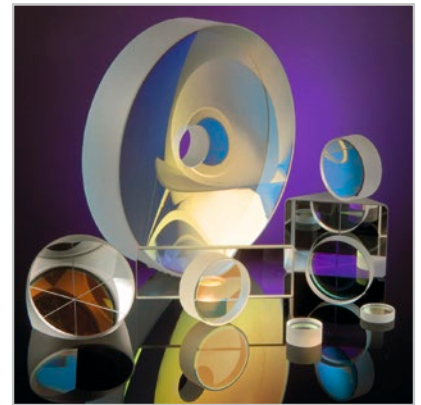
This is also a "cold coating." The coatings are applied at low temperatures. This makes it possible to coat temperature-sensitive materials, such as, for example, laser crystals.

With the IBS process, very complex layer structures with more than one hundred layers can be manufactured. This allows the highest degree of reflection of $R > 99.99\%$ to be achieved.

In Laser Components' specialized IBS coater, the index of refraction can be varied during the coating process. This aids the development of layer structures with a progression in the index of refraction, which in turn makes it possible to develop novel coatings and, more important, very high damage thresholds.

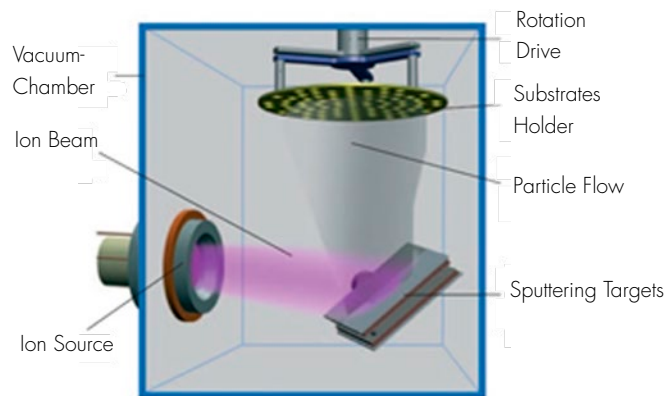
A comparison of all processes available at LASER COMPONENTS revealed that modern IBS coating is the leading method of coating in damage threshold tests. In special coatings in particular, such as, for example, in thin-film polarizers, a significant improvement can be achieved.

Due to the coating material used in the past, the IBS coater had not yet been applied in the UV range. This gap was filled in 2013 with the introduction of a new coating material. It is now possible to offer the positive characteristics of IBS coatings for the spectral range of > 260 nm.



Advantages of IBS Coatings

- Drift-free layers
- Low-dispersion coatings
- "Cold coatings" on temperature-sensitive materials
- Extremely high degree of reflection $R > 99.99\%$
- Coatings with varying indices of refraction (so-called mixed layers) for very high damage thresholds
- Dichroic mirrors with wide transmission bands that have a consistently high transmission
- Chirped mirrors for fs applications
- Very broadband mirrors and AR coatings
- Narrowband coatings for high-power compatible filters
- Wide wavelength range from 260 nm to 3000 nm



Ion Beam Sputtering (IBS)