



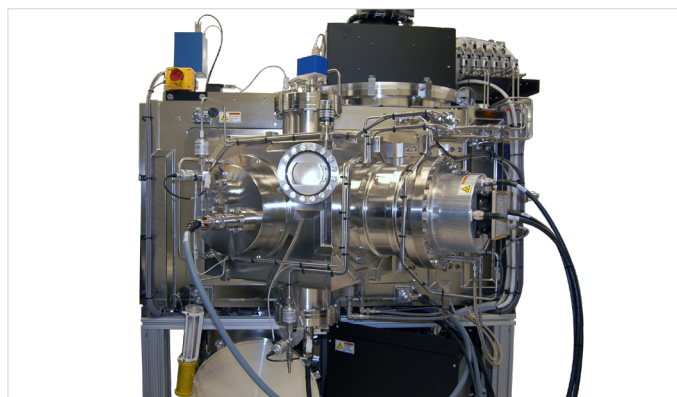
## INFINITY ION BEAM SPUTTERING SOLUTION

### TECHNICAL SPECIFICATION SHEET

Patented ion beam sputtering technology provides higher performance than traditional thin film deposition technologies.

#### BENEFITS INCLUDE:

- Wide range of process pressures
- Control of adatom energies
- Excellent uniformity and repeatability
- Low defect and low contamination
- Atomically engineered thin film interfaces and surfaces
- Able to accommodate multiple substrate sizes up to 8"



FEATURES		BENEFITS	
Ion beam sputtering		Extreme thickness uniformity Dense, defect free films	
Low process pressure		Large mean free path Collimation Dense films	
Compatible with front-end options		Easily scalable to meet throughput demands	
Automation software		Enhanced process control	
Short MTTR/Long MTBF		High system uptime and ease of maintenance	

## SYSTEM OVERVIEW

The Denton Infinity Ion Beam Deposition System employs an energetic beam of inert gas ions harnessed from an RF ion source to bombard a target material. The resulting sputter plume is deposited on a rotating fixture. Thin films created through ion beam sputtering are of a high quality and have very precise thickness due to the monoenergetic ion beam used. This process is often used to create coatings for precision optics and semiconductors, where the utmost precision is required.

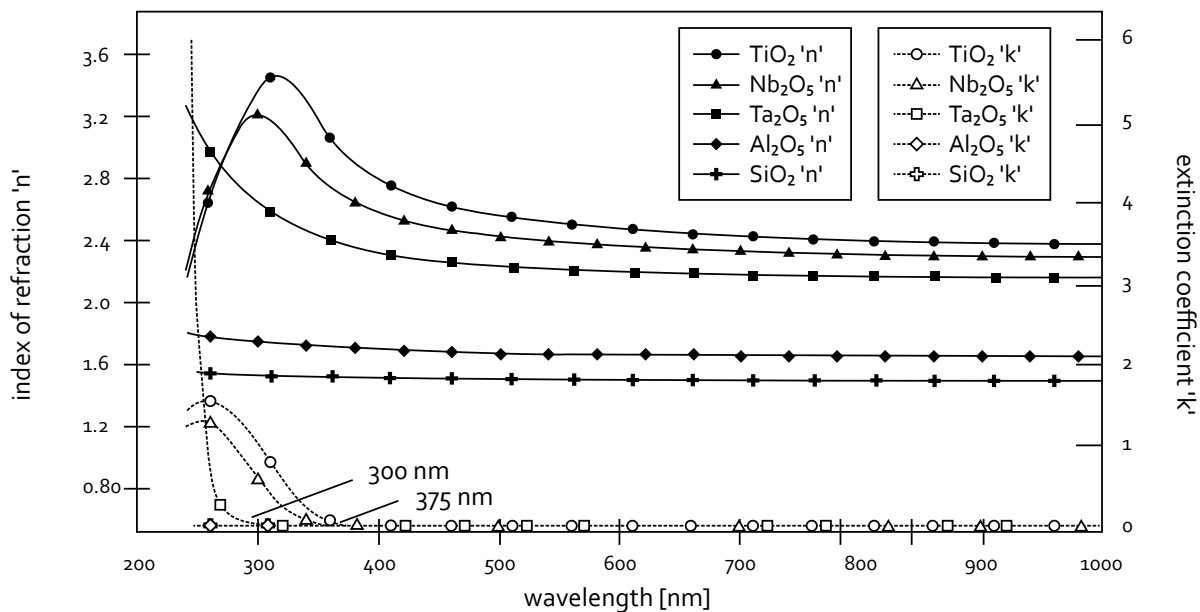
The major components of the Denton Infinity IBD System are the cassette elevator and the processing module. Each of these modules is fitted with independent vacuum control mechanisms including a roughing pump (dry pump), cryogenic pump, compressor and the various isolation valves and smart gauges.

The PM is the main processing chamber for vanadium oxide and is fitted with a larger high vacuum pump and compressor. In addition, the PM contains a 12CM RF ion source, an RF generator, two plasma bridge neutralizers or PBNs, a 200mm substrate stage and a two-sided 16" target assembly. Other key mechanisms of the process module include several feedback sensors that enable the advanced process controls of ion beam reactive processing, for dielectric films in precision optics including laser mirrors (e.g.,  $\text{SiO}_2$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{Nb}_2\text{O}_5$ ,  $\text{TiO}_2$ ).

### APPLICATIONS:

- Precision optics (Lasers, IR detectors)
- VCSEL anti-reflective coatings
- VOx microbolometers
- High-efficiency solar cells
- Spin valves for magnetic recording

Optical Properties of Oxides Prepared by Ion Beam Deposition



See footnote for reference

## CONFIGURATION OPTIONS

### ION BEAM DEPOSITION

Assist Source for  
Preclean and Densification

In-situ Thickness Control

Residual Gas Analyzer

### FRONT ENDS

Single Wafer Load Lock

Cassette Load Lock

Cluster Tool Front End

Devasahayam, A.J., Agatic, I., Druz, B., Hegde, H., Zaritsky, I., Das, S. R., Boudreau, M., Yin, T., Mallard, R., and LaFramboise, S. "Material Properties of Ion Beam Deposited Oxides for the Optoelectronic Industry," American Vacuum Society (2002).