



## INFINITY Z-FLEX ION BEAM SOLUTION

### TECHNICAL SPECIFICATION SHEET

Denton Vacuum Infinity Z-Flex combines the best of ion beam etching and the best of ion beam sputtering in one tool to provide the flexibility for a wide range of applications.

#### BENEFITS INCLUDE:

- Ion beam etch and deposition in one vacuum chamber
- Wide range of process pressures
- Control of adatom energies
- Atomically engineered thin film interfaces and surfaces
- Low plasma damage etching
- Excellent uniformity and repeatability



Infinity Biased Target Deposition System

FEATURES	BENEFITS	
Ion beam sputtering	Excellent thickness uniformity Dense, defect free films	
Biased substrate	Low plasma damage etch	
Biased target sputtering	Independent control of ion currents and energies, interface engineering	
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

Get the best of ion beam etching and ion beam sputtering in one tool with the flexible Infinity Z-Flex Ion Beam system. The system is fully computer controlled and features an integrated single wafer transfer system, boasting a versatile and optimized geometry for numerous sputtering and etching/milling modes.

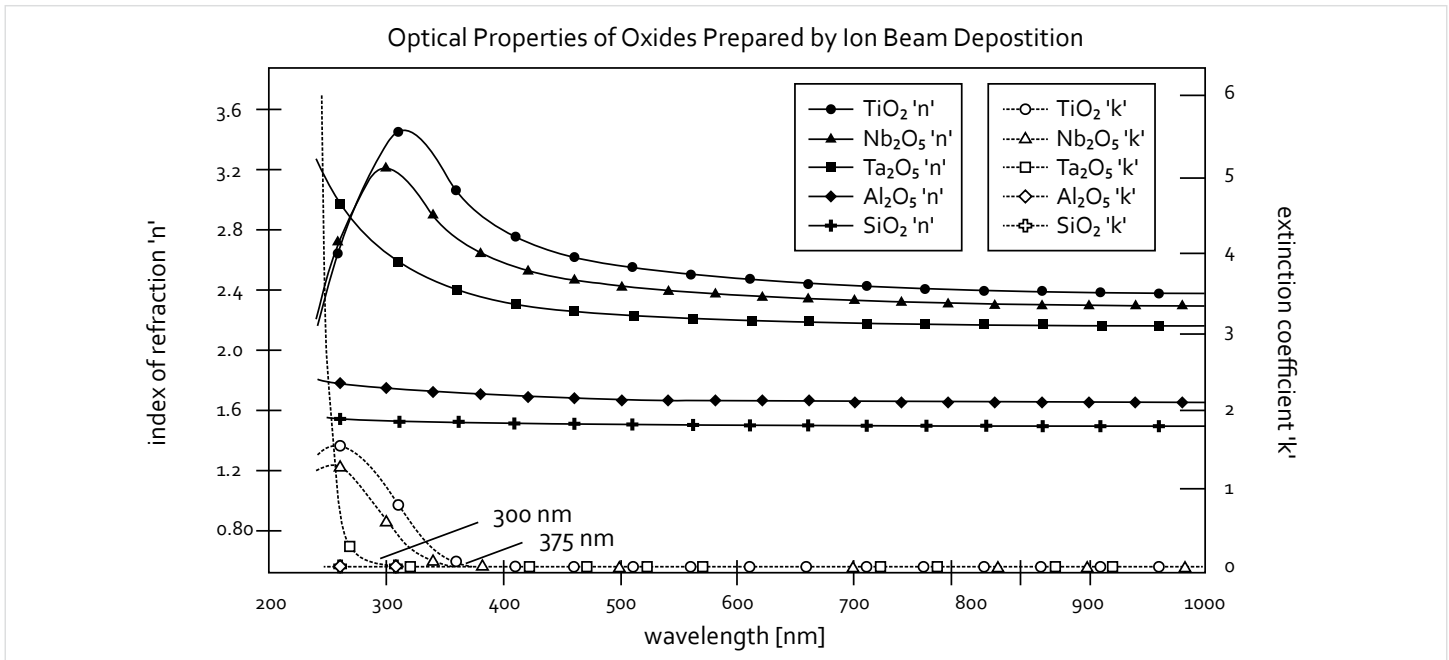
Denton's patented biased target sputtering (BTS), ion beam sputtering and biased substrate etching technologies are available in this package for enhanced thin film engineering and process control. Ion beam etching (IBE) uses an energetic, broad beam collimated and highly directional ion source to physically mill material from a substrate mounted on a rotating fixture with adjustable tilt angle. The ion sources used are gridded ion sources of the Kaufman type and are typically neutralized with an independent electron source.

For ion beam deposition, the Z-Flex contains a 12cm RF ion source, an RF generator, two plasma bridge neutralizers or PBNS, a substrate stage and up to four sputter targets. Other key mechanisms of the process module include several feedback sensors that enable the advanced process controls of the ion beam reactive processing, for dielectric films in precision optics including laser mirrors (e.g., SiO<sub>2</sub>, Ta<sub>2</sub>O<sub>5</sub>, Nb<sub>2</sub>O<sub>5</sub>, TiO<sub>2</sub>).

These technologies enable the deposition of high-quality thin film structures using a common vacuum, making it a perfect solution for semiconductor, MEMS, laser and data storage applications such as HAMR, thin film optics and etching & overcoat processing.

## APPLICATIONS:

- Disk slider fabrication
- HAMR and TMR applications (heat assisted & tunnel magnetoresistance sensors)
- FinFET (fin field-effect transistor) and advanced memory development
- Laser facet coatings



See footnote for reference

## CONFIGURATION OPTIONS

<b>ION BEAM DEPOSITION</b>	Assist Source for Preclean and Densification	In-situ Thickness Control	Residual Gas Analyzer
<b>ETCH METHOD</b>	Ion Beam	Reactive Ion Beam	Chemically Assisted Ion Beam
<b>ETCH MODULE</b>	SIMS	Electrostatic Chuck	Biased Chuck

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).