

About us

We specialize in design and fabrication of plasma and charged particle beam sources as well as complete vacuum electronic equipments. As the first innovative product of our startup, we have developed a versatile vacuum coating system, named IONEX, based on the ion beam deposition (IBD) technology. IBD produces the highest quality thin films with excellent precision. This state-of-the-art technology for PVD coating is used when tight control over film thickness and stoichiometry is needed. Adhesion, density, non-porosity, uniformity and smoothness are some important characteristics of a thin film which are significantly enhanced by IBD.

IONEX is the most advanced PVD platform and also the first IBD system manufactured in Iran. Its capabilities include direct ion beam deposition, single and dual ion beam sputter deposition, ion beam assisted or enhanced deposition [together with traditional methods such as resistive evaporation, electron beam evaporation, magnetron sputtering], ion beam cleaning, ion beam etching and so on. This all-in-one deposition system provides a unique opportunity for researchers to develop the next generation multilayer coatings.

IONEX IS A VISION EXPANSE



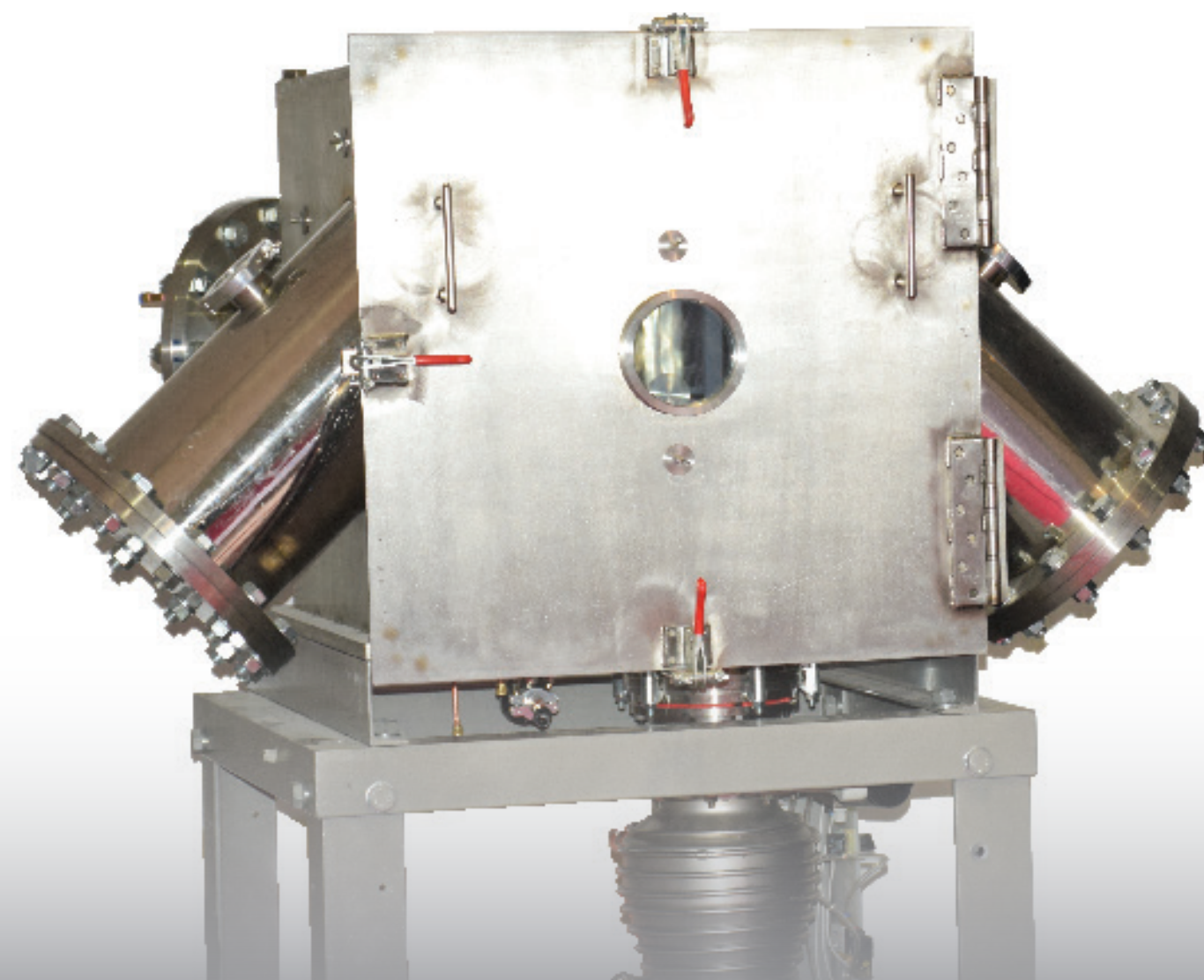
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IONEX Ion Beam Deposition System

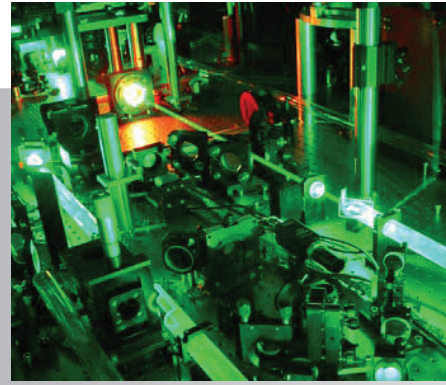
A versatile **ion experimental** vacuum coating system for R&D and pilot production





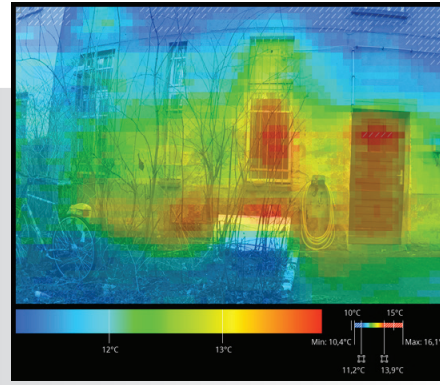
Precision optics

Dense and stable films with optimized refractive indices and low absorption.



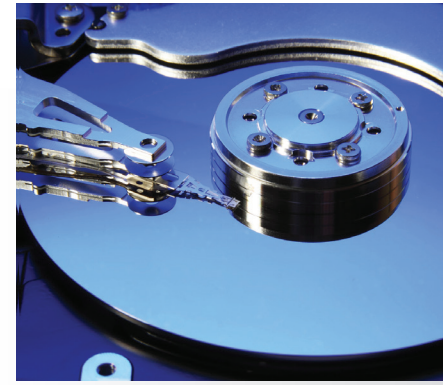
Photonics and lasers

Smooth, low-scatter, and optically pure films with high laser-induced damage thresholds.



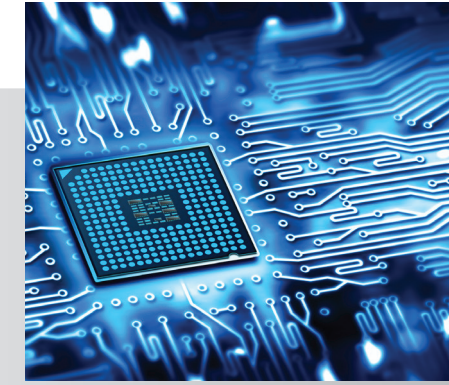
MEMS, Sensors, Displays

Surface modification and texturing to amplify surface work functions.



Magnetic data storage

Anisotropic and uniform etching of nanometer features in metal and dielectric multilayer stacks.



Semiconductors

Reproducible adhesion of metal coatings for high yield lift-off processes.

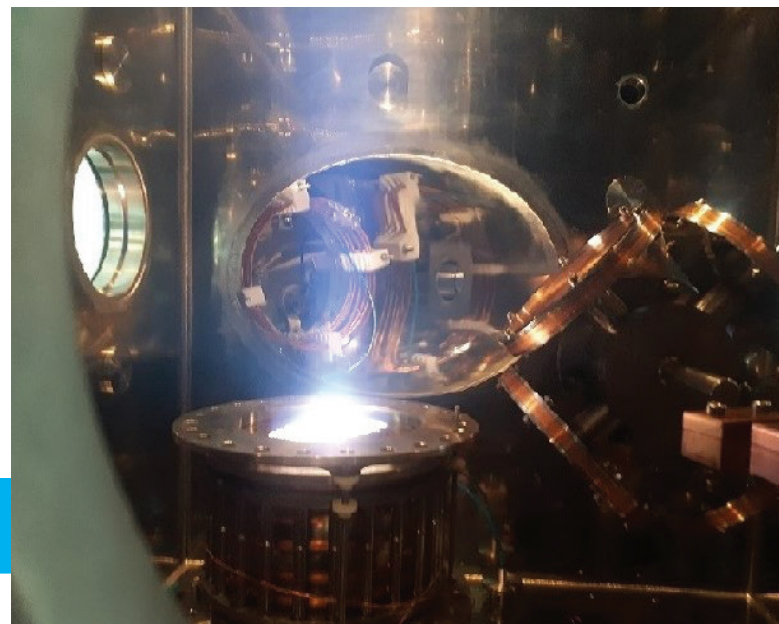


Medical devices

Hard and corrosion-resistant organic coatings which exhibit designable biological activity.

Highlights

- Separation of the physical phenomena involved in deposition process including plasma generation, ion acceleration, target sputtering and film growth
- Independent control of ion's parameters such as energy, current density and incident angle
- Lower operating pressure [1-2 order of magnitude lower than that of magnetron sputtering]
- High target utilization and more uniform coating
- Low contamination and high purity thin film
- High density thin film due to high energy sputtered atoms
- Increased adhesion of the film to the substrate
- High accuracy in control of deposition rate and film thickness
- Deposition of a broad range of materials such as metal, dielectric, semiconductor and ferromagnetic
- Deposition of alloys and compounds by high energy reactive ions
- The unique solution for advanced dielectric multilayer coatings



What you desire for
ALL-IN-ONE

Specifications

► Vacuum chamber:

Material: 304L stainless steel, Shape: cube, Volume: ~ 350 liter, Access: front hinged door, Leak rate: $\sim 10^{-5}$ mbar.l/s, Base pressure: $\sim 10^{-6}$ mbar, 3× ISO-F250 flange, 3× ISO-K50 flange, 3× ISO-K25 flange, 50× 1" hole, 4× 2" hole, 3× 140 mm view port

► Vacuum pumps and gauges:

1× dry or oil-sealed backing pump, pumping speed: ≥ 25 m³/h
1× cryo or turbomolecular or diffusion pump with a cold trap, inlet flange: ISO-K200
1× Pirani gauge and 1× cold cathode full-range gauge

► Equipment:

- 4× water-cooled gridded ion source, source type: FCP or ICP, beam diameter: 12 cm, ion energy: 100-1200 eV, ion current: < 400 mA, extraction system: 3-grids accel-decel, grid shape: flat or concave or convex, space charge neutralization: filament or hollow cathode
- 2× water cooled 4" magnetron sputtering cathode, power: 1kW DC or 600W RF
- 1× water-cooled 4-crucible electron gun, power: 3 kW, energy: 6 keV
- 2× water-cooled 400 A resistive evaporator
- 3× 1 kW radiant heater
- 1× substrate holder, capacity: 4×8" or 6×6" or 12×4" samples
- 1× water-cooled target holder, capacity: 4×6" target
- 3× water-cooled quartz crystal holder
- Shutters for all equipment

► Control system:

PLC and 12" touch screen HMI
Control modes: manual, semi-automatic
Process recipe control and data logging
Safety interlocks

