

# Nanochrome™ II

*Thin Film Deposition System*

## Process Methods

- Ion Beam Assisted Deposition (IBAD)
- Co-sputtering
- RF, AC, & DC Planar Magnetron Sputtering

## Applications

- Precision Optical Coatings
- Optical Filters
- Anti-reflective Coatings
- Semiconductors & Dielectric Materials
- Superconductors



# NANOCHROME™ II

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INTLVAC THIN FILM's Nanochrome™ II system is an ideal platform for Physical Vapor Deposition. A variety of configurations are possible, all tailored to your specific needs. With its small footprint, low cost, and ease of operation, the Nanochrome™ II (NCII) system is an ideal choice for your thin film coating needs.

Graphic display by LabVIEW shows the system status at every step of your process whether you are standing in front of the system or at your desk.

Electron beam, Thermal Evaporation, Magnetron Sputter deposition can be easily configured into the NCII .

## CHAMBER DESIGN

The Nanochrome™ II is built around a vertical "clam shell" design that gives you easy access to all parts of the chamber. Water cooling/heating traces speed pump down times. A periscope assembly permits full viewing of your PVD sources while operating. The chamber has several optical paths to allow viewing of thin films as they grow to enable real-time measurement and control of your optical coatings.



## MULTIPLE PROCESS OPTIONS

### *Hard Coatings*

Electron Beam Evaporation for metals or dielectrics with ion assist, magnetron sputtering of metals, or reactive sputtering by pulsed RF, DC or AC, with ion assist easily configured into the system. INTLVAC THIN FILM's Nanochrome™ II utilizes the latest in Ion Beam technology with next generation gridless Kaufman & Robinson Ion Sources.

### *Soft Coatings*

Careful attention to temperature control allows the most delicate thin films to be deposited automatically. Indium, Tin, Cryolite and Zinc Sulfide are only a few of the materials that benefit from a cold wall, high vacuum environment.



# Thin Film Deposition

## FIXTURING

Your system can be designed for a number of different substrate holders such as: flat plate planetary, rotating hub, flip fixture planetary, or planetary dome. Substrate revolution and planetary rotation ensures uniform coatings. Inside the Nanochrome™ II, you'll find quartz halogen lamp heaters, quartz crystal sensors, thermocouples and fully automated shutters for total process control.



## HIGH VACUUM CAPABILITIES

Our systems easily achieve ultimate pressures of  $5 \times 10^{-8}$  Torr without heating, careful attention to details such as low surface area construction, electropolish, and elimination of trapped volumes ensure fast pump down times. INTLVAC THIN FILM's high vacuum pumping standard is with all dry pumps.

## SPECIAL OPTIONS

### *Low Temperature Operation*

The latent heat of fusion can be a limiting factor in depositing many thin films. Cooling options can allow you to increase deposition rates. Use INTLVAC THIN FILM's family of Ion Beam substrate stages to directly cool your substrates while depositing films on them. Single or double axis planetary motion, with cooling fluid circulating directly under the substrates is available.

### *High Temperature Options*

IR back side heating element, quartz lamp arrays, and oxygen resistant heating elements may be selected to achieve temperatures as high as 800°C.

### *Ion Sources for Precleaning, Assist & Reactive Operation*

High beam currents and low energy are ideal for film densification or cleaning or assist over large areas.

Completely filament-less, the new generation of sources we offer are ideal for your coating needs. End Hall gridless sources with up to 10 amps of ion current at energies below 300eV, to gridded, RF sources with up to 1 amp and ion energies selectable from 100 to 1000eV are available.





# PROVIDING TECHNOLOGY SOLUTIONS

At Intlvac, we design and manufacture a wide variety of systems for Thin Film PVD and Etch. Our product line ranges from small R&D/pilot project systems to large production systems utilizing processes such as Ion Beam Etching, Sputtering, E-beam, Thermal Evaporation, Fiber-optic coating, and more!



*Clockwise from left: Nanochrome™ Plasma-Enhanced Reactive Magnetron Sputtering (PARMS) / PECVD-DLC System / Nanoquest II Ion Beam & Magnetron Sputter Plus Etch.*

Our line-up of Nanochrome™ Thin Film Deposition systems covers a wide range of needs starting with our Nanochrome™ PICO for R&D or Engineering quantities up to our Nanochrome P.A.R.M.S. for production of high performance interference filters. Contact INTLVAC to learn more about which tool might be suitable for you.



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