

■ ■ ■ Gridless end-Hall ■ ■ ■ Ion Sources

*For Ion Assisted Thin Film
Deposition & Substrate Cleaning*



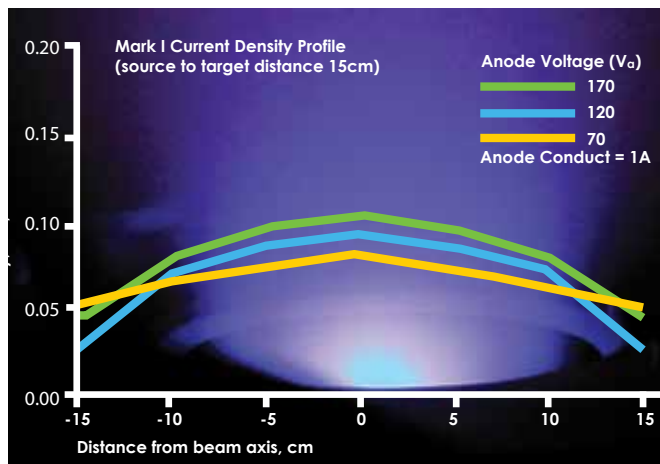
END-HALL ION SOURCES

MARK I ION SOURCE

The Mark I End-Hall is ideal for small research and development and pilot production e-beam coating systems.

FEATURES

- Reactive gas compatible
- Low contamination
- Rugged and reliable
- Ideal for small systems



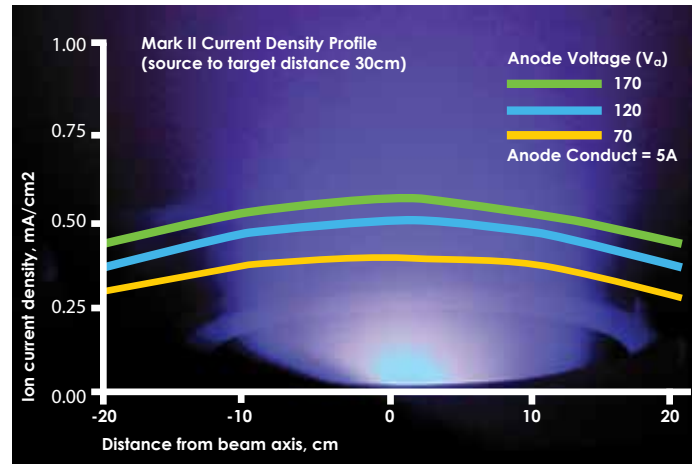
DEVICE/PROCESS	MATERIALS
Source dimensions: (dia. x length)	6.4 cm x 11.4 cm
Chamber size:	up to 60 cm
Throw distance: (source-to-substrate)	up to 30 cm
Ion energy:	50-170 eV
Beam current:	up to 200 mA
Operating pressure:	$<3 \times 10^{-4}$ Torr
Magnet:	High-Curie point permanent
Cathode/neutralizer:	Immersed filament or HCES
Gas requirements:	3-10 sccm

MARK II ION SOURCE

The Mark II is the industry standard source for optical coating systems and is the most widely used ion assist source.

FEATURES

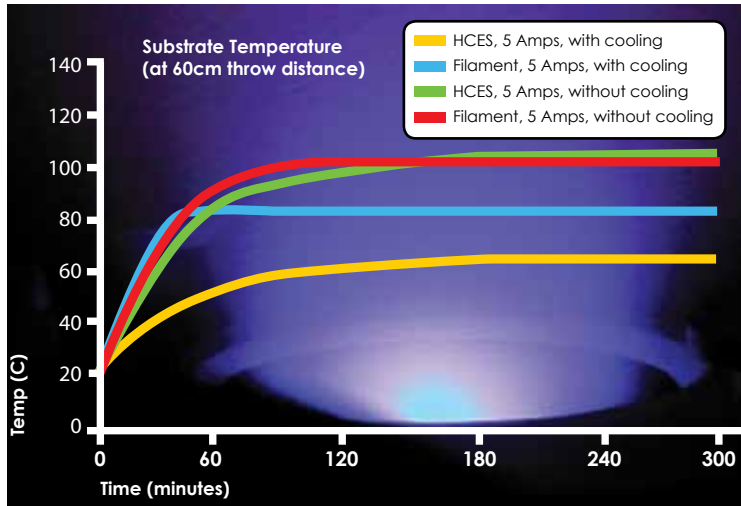
- Production proven design
- Reactive gas compatible
- Low contamination
- Numerous options available



DEVICE/PROCESS	MATERIALS
Source dimensions: (dia. x length)	14 cm x 19 cm
Chamber size:	60-150 cm
Throw distance: (source-to-substrate)	30-90 cm
Ion energy:	60-170 eV
Beam current:	up to 1000 mA
Operating pressure:	$<3 \times 10^{-4}$ Torr
Magnet:	High-Curie point permanent
Cathode/neutralizer:	Immersed filament or HCES
Gas requirements:	10-50 sccm

WATER-COOLED MARK II ION SOURCE

The Water-Cooled Mark II Ion Source adds efficient cooling for processes requiring low temperatures and reduced cycle times. Engineered and tested to withstand rigorous production environments, the Water-Cooled Mark II has a distinctive anode design which promotes excellent heat transfer out of the vacuum chamber and away from substrates.



WATER-COOLED FEATURES & BENEFITS

- Dramatically reduced substrate temperatures
- Elimination of cool-down prior to venting
- Greater ion beam stability/control

RESULTS

- Reduced stress
- Increased production throughput
- Reproducible film properties

MARK II - HCES

The Mark II ion source is configured with a Hollow Cathode Electron Source (HCES) to permit long run times with reactive gases while maintaining consistent and reliable operation. Ideal for oxygen and other long reactive processes, the HCES provides sufficient electron emission for ionization and beam neutralization. When combined with the Water-cooled anode, the Mark II-HCES provides the coolest operation of the Mark II Series.

BENEFITS

- Filamentless operation
- Reduced contamination
- Cool source operation



END-HALL ION SOURCES

GRIDLESS ION SOURCE POWER SUPPLIES

Reverse compatible

- Remote I/O is pin to pin compatible
- Faster operation & response
- Digital & Switching technology
- Quick start (learn)
- More stable operation

- Dual regulation
- More reliable
- Low stored energy & output limits
- Longer filament lifetime
- Filament soft-start
- Triple filament lifetime option

Mark I & Mark II Power Supply



END-HALL ION SOURCE POWER PACK CONTROLLER:

	FILAMENT VERSION	HOLLOW CATHODE VERSION
PRODUCTS:	Mark I and Mark II	Mark I, Mark II, Mark II HO, Mark III
• FILAMENT	7A emission current Soft Start	10A emission current Soft Start
• DISCHARGE	1A or 5A & 170V DC Standard and low voltages	10A or 5A & 300V DC Standard and low voltages
• AUTOCONTROLLER	System Control Gas Control - 4 MFCs Open or closed gas loop control Automatic Start/Stop Sequence	"Autopilot" System Control Gas Control - 4 MFCs Open or closed gas loop control Automatic Start/Stop Sequence
REMOTE INTERFACE:	Isolated analog & RS-232	Isolated analog & RS-232
INTERCHANGABLE:	Mark I & Mark II reverse compatible	Mark I & Mark II reverse compatible
SIZE:	19" rack mount, 3U (13.3cm)	19" rack mount, 3U (13.3cm)

MARK II WATER-COOLING RETRO-FIT KIT

BENEFITS OF A WATER-COOLED ANODE

Promote amorphous/crystalline growth

- Near bulk indices

Increased packing density

- Eliminates water absorption
- Low spectral shift
- Hard, environmentally durable coatings

Improved Step Coverage

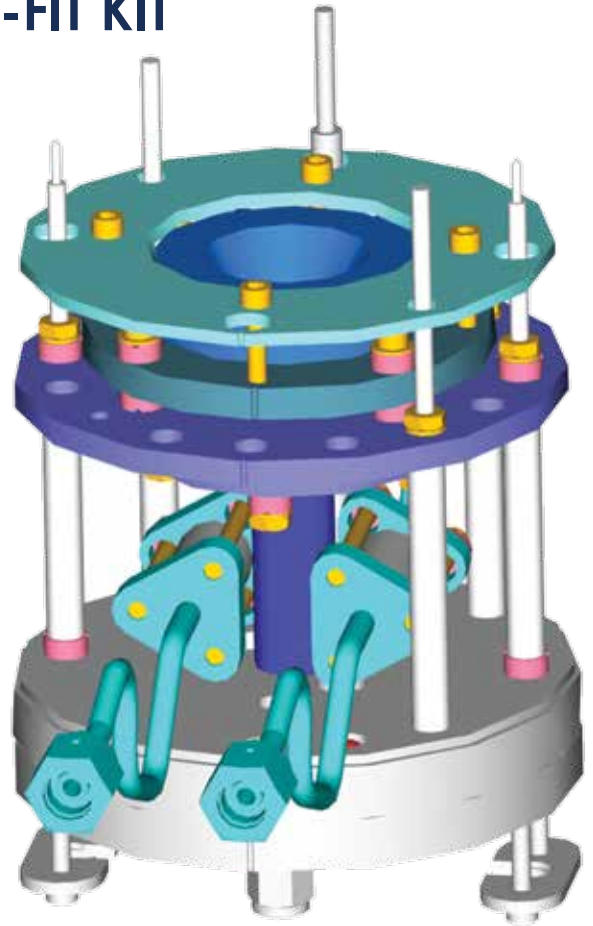
- Preferred grain sizes and boundaries
- Minimizes scatter and absorption

Improved Adhesion

- Films adhere to substrates and each other

Control Stoichiometry

- Predictable and reproducible films



HOLLOW CATHODE ELECTRON SOURCE RETRO-FIT KIT



Used instead of a tungsten filament, the Hollow Cathode Electron Source (HCES) ensures a contamination free environment and reduces maintenance intervals.

Intlvac's new Hollow Cathode Tip can run for over 150 hours before replacement.

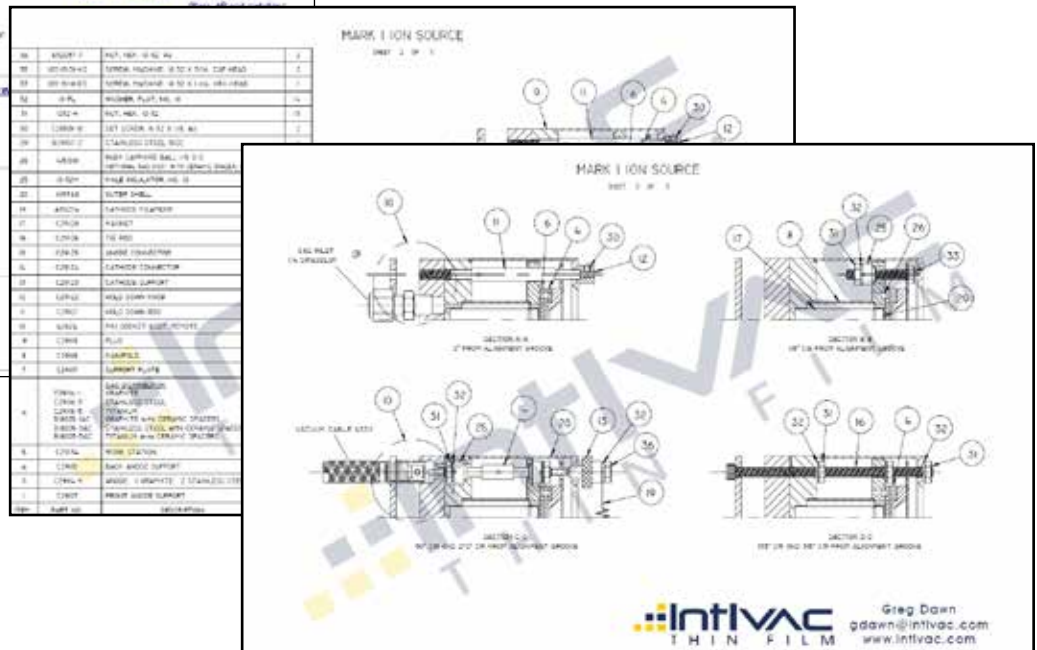
Our retro-fit kits come complete with everything you need to make the switch.

END-HALL ION SOURCES

CONVENIENT ONLINE SHOPPING



- Every part stock
- Next day shipping
- Easy credit card checkout
- Fast, friendly, customer support



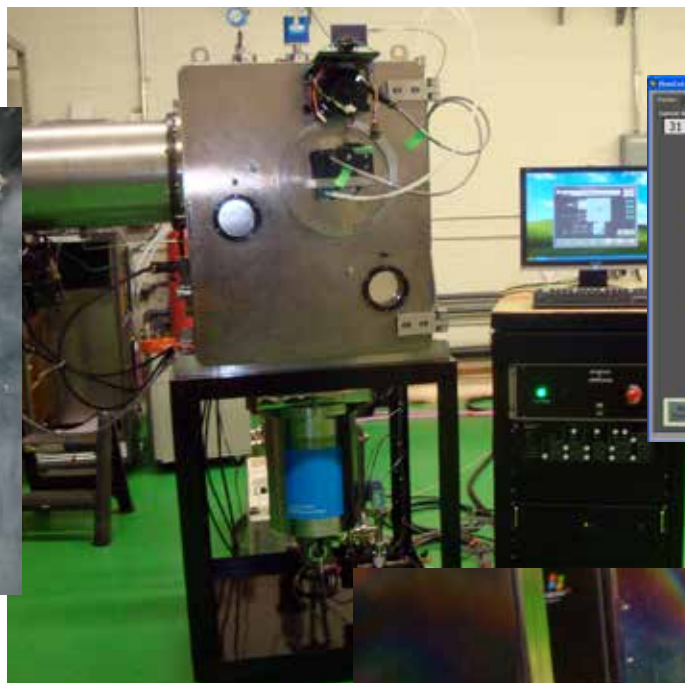
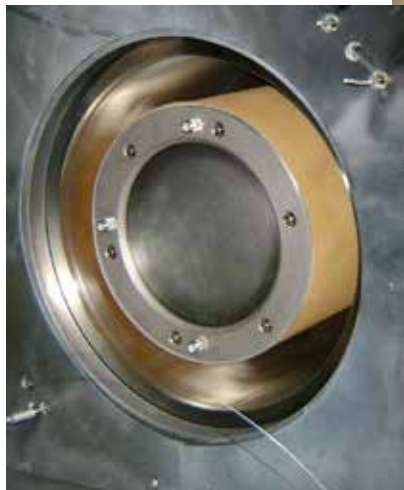
INTLVAC THIN FILM manufactures and has IN STOCK every part for the Mark I and Mark II ion sources at our NY facility. Orders are shipped the same day and there is always someone available to answer any of your questions.

Our website, www.intlvac.com, has a price and picture of every part. Plus we have complete assembly drawings of the Mark I and Mark II ion source to help you determine what parts you require.

REFURBISH & RETROFIT

COMMONWEALTH SCIENTIFIC & VEECO ION TECH

Upgrade your old Commonwealth Scientific or Veeco Ion Tech system to a state of the art ion source and modern control system utilizing a LabVIEW interface and datalogging of your process. Substrate stages can also be refurbished with new parts made to the original specifications



MARK I AND MARK II SOURCES

Intlvac provides full service refurbishing of Mark I and Mark II ion sources using parts made to the original specifications .

PROVIDING LEADING-EDGE TECHNOLOGY SOLUTIONS

Intlvac has a long-standing commitment to quality and excellence in the optical coating industry. Our goal is to deliver value-added solutions that exceed expectations. Research and development play a major role in our technology's edge in the market.

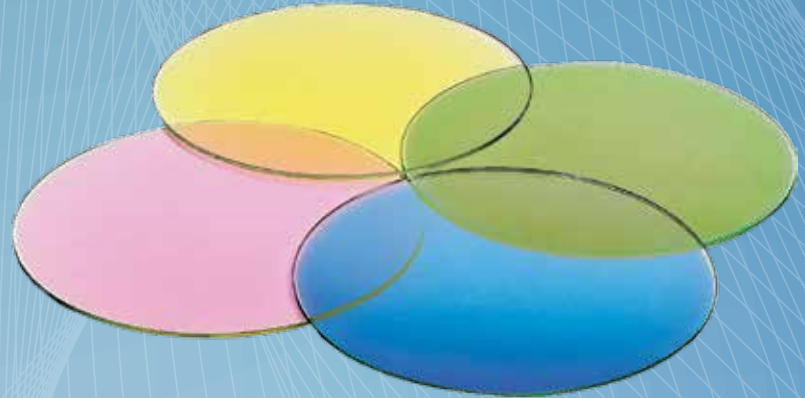
Our in-house development lab designs, engineers and manufactures the systems we use for thin film coatings.



THIN FILM COATING DEVELOPMENT SERVICE

Intlvac has taken advantage of decades of experience in designing and building thin film coating tools. We have our own in-house systems for processes such as E-beam, Thermal Evaporation, and Reactive Sputtering.

We can provide coating services from R&D to pilot production quantities. Our in-house tools include a NC-IV P.A.R.M.S. for development and evaluation.



THIN FILM PVD AND ETCH SERVICES

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 and Thermal Evaporation fiber-optic coating and more!