



Extreme Performance Optical Coatings

SPECIALIZING IN PRECISION ION BEAM SPUTTERING AND ATOMIC LAYER DEPOSITION COATINGS

Across the most demanding industries—defense, aerospace, medical, semiconductor, industrial, and scientific—customers rely on General Atomics Electromagnetic Systems (GA-EMS) for advanced optical coatings and components. From high-energy laser systems to FDA-approved medical devices, GA-EMS delivers optics that push the boundaries of performance.

As a fully integrated partner for precision optical coatings, GA-EMS provides a one-stop solution, sourcing raw materials and precision optical components from pre-qualified, trusted vendors. By combining world-class coating design, advanced manufacturing, and comprehensive metrology, GA-EMS ensures exceptional performance, reliability, and consistency at every stage.

ENGINEERED FOR PERFORMANCE. BUILT FOR RELIABILITY.

Ultra-high reflectivity — >99.999% R with <1 ppm absorption in the 1 μm band and <0.2% coating non-uniformity across a 152 mm optic

Ultra-low absorption and scatter coatings for high-power laser performance

Industry-leading Ion Beam Sputtering deposition technology

Advanced metrology and process control for consistent, repeatable coating quality

Prototype-to-production expertise supporting OEM-scale manufacturing

ADVANCED METROLOGY

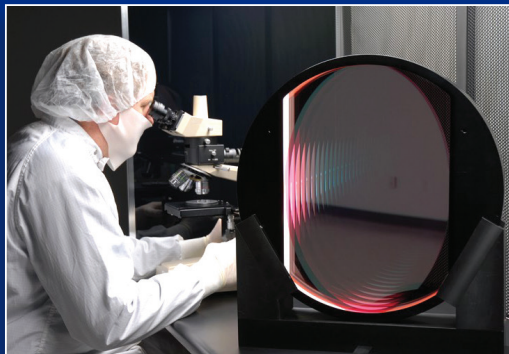
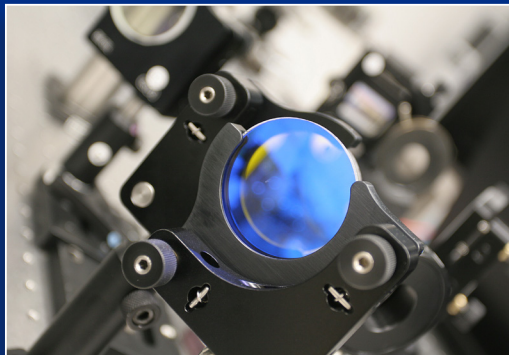
Spectral measurement from UV to far IR

Laser-based reflectance/transmittance testing

Absorption sensitivity <1 ppm

Surface characterization up to 12" apertures

High-resolution interferometry and profilometry



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GA-EMS designs coatings prior to quotation to refine specifications, reduce risk, and optimize system performance. Supported by precision manufacturing at scale, GA-EMS delivers everything from prototype development to high-volume production, including coating of customer-supplied optics, operation of eleven Ion Beam Sputtering chambers (with large-format capability), and custom process adaptation for complex requirements.

Our large-optics capabilities support substrates up to 28" in diameter, with <1% non-uniformity, reflectivity exceeding 99.998%, and broadband performance across a 200–5000 nm range (UV through NIR with reach into the MIR).

ION BEAM SPUTTERING (IBS)

Ideal for high-energy lasers, aerospace systems, and precision photonics.

CHARACTERISTICS	BENEFITS
<ul style="list-style-type: none">• Precise control of film properties• Exceptional stoichiometry• Smooth film boundaries• Low process temperatures• Fully dense, robust films	<ul style="list-style-type: none">• Predictable and repeatable optical performance• Ultra-low absorption and scatter• Laser damage resistance• Space qualified

ULTRAFAST OPTICS & DISPERSION CONTROL

Advanced solutions for femtosecond laser systems:

- Precise Group Delay Dispersion (GDD) control
- Measurement accuracy up to $\pm 10 \text{ fs}^2$
- High-resolution spectral performance

ATOMIC LAYER DEPOSITION (ALD)

Hybrid IBS + ALD coatings provide enhanced durability for harsh environments and high-energy applications.

- Monolayer-level thickness control
- Fully dense, pinhole-free films
- Uniform coatings on complex geometries
- Chemical and environmental resistance



CONTACT INFORMATION

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