

DLC for IR Optics

Diamond Like Carbon Deposition



Advantages of DLC for Infrared Optics

- High hardness
- Low Friction
- Electrical Insulation
- Resistance to Wear
- Chemical Inertness
- High Thermal Conductivity
- Optical Transparency in IR λ
- Biological Compatibility

DIAMOND LIKE CARBON

APPLICATIONS

Optics

DLC coating acts as a single-layer anti-reflection coating for high index substrates and it provides wear & chemical resistance for optical elements used in harsh environments.

Bio-engineering

DLC provides advantages of bio-compatibility, wear resistance, and diffusion resistance.

Mechanical Engineering

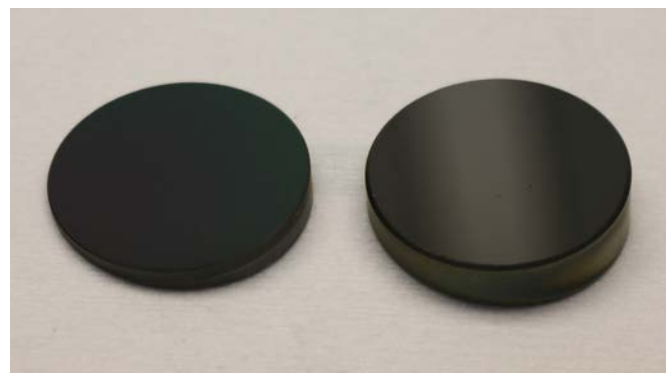
DLC provides wear & corrosion resistance, low friction, and good thermal conductivity.



DLC on chalcogenide lenses

AREAS OF EXPERTISE

- Space Simulation systems for testing of components and micro-satellites
- Dielectric thin films by ion beam sputtering and reactive magnetron sputtering
- Ion beams and plasma to enhance thin film properties
- Surface cleaning and activation for thin film deposition by a variety of processes



SUBSTRATES FOR DLC

IR Optics:

- Silicon, Germanium, ZnS, ZnSe

Chalcogenides

- GASIR, IG-1, IG-6

Plastics:

- Ultem, Polycarbonate, Polyimide, PEEK

Glass:

- BK7, Crown Glass, UVFS, SF11, Sapphire

Metals:

- Aluminum, Copper, High-carbon Steel



sales@intlvac.com

PLASMA ENHANCED CHEMICAL VAPOR DEPOSITION

SYSTEM PERFORMANCE

Uniformity of low index DLC (Thickness, glass slides)

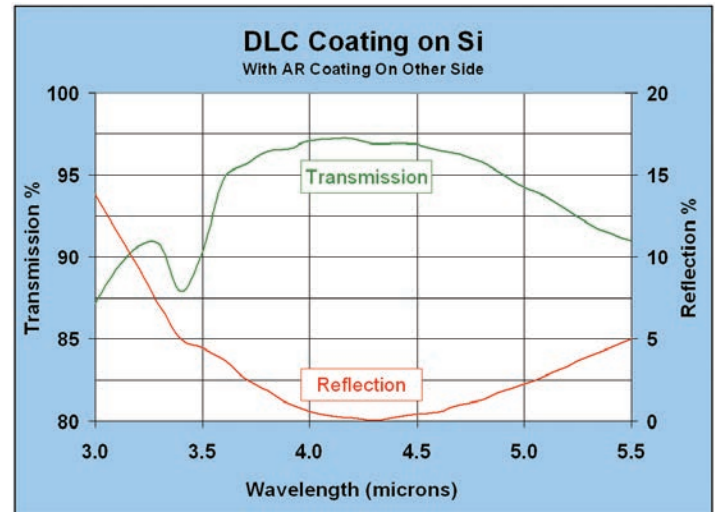
- 13-points along 2 horizontal axes: $\pm 5\%$, 0.7% run-to-run over 5 consecutive runs

Uniformity of high index DLC (Optical, Ge & Si)

- 5-point along the radius: $\%T_{av}$ (8-12 μm) $< \pm 0.2\%$
- $\%T_{av}$ 8-12 μm : $< \pm 0.5\%$ run-to-run over 5 runs
- 3-5 μm : $\%T_{peak} \pm 0.7\%$ run-to-run over 5 runs

Cycle time of less than 2 hours for 8-12 μm coatings

Intlvac Thin Film DLC conforms to TS1888 Wiper Test and all relevant MIL-C-48497A and MIL-C-675C tests.



DLC PROCESSES AVAILABLE

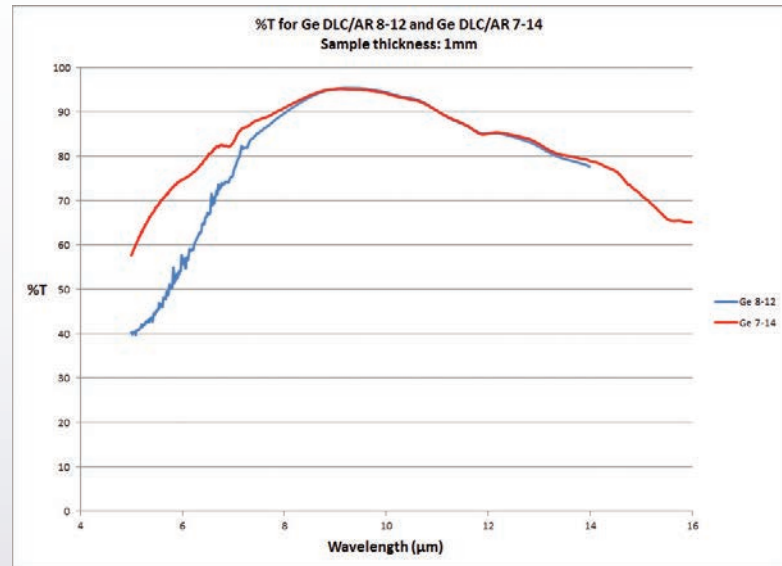
- Low index DLC for adhesion on Ultem plastic substrate for MEMS devices
- High index DLC for IR optics such as Ge & Si
- DLC on GASIR (and similar) utilizing a second hydrocarbon gas with proprietary stress relief techniques
- DLC on IG-6 using a binding layer
- DLC with stress reduction



CONTROL SYSTEM AND AUTOMATION

The Intlvac Thin Film DLC system is fully automated using INTLVAC's AUTOSYS Control System with touchscreen interface; the standard on all INTLVAC systems.

This software package provides a user-friendly, yet comprehensive, graphical interface that allows you to easily view, edit, save, and upload an unlimited number of recipes. The complete history of your system is recorded as well as individual runs in a format ready to import to your favorite spreadsheet software for analysis.



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! Call today to discuss your specific requirements.



Intlvac Thin Film Corporation
1401 Duff Drive, Unit 600, Fort Collins, CO USA 80524
Phone: 970.305.8508 Toll Free: 800.959.5517 Fax: 970.237.4651
www.intlvac.com sales@intlvac.com