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**Thin Film Coatings and Optics
 for Astronomical Telescopes
 and Instrumentation**



Medical & Laser Coatings

High Reflectors from 193nm-10600nm
 (cavity optics & beam delivery),
 Non-Polarizing Beamsplitters,
 Short and Long Wave Pass Filters
 Multi Spectral & Laser Eye Safe.



**Defense Applications
 for Land, Sea, and Air**

- FLIR Night Vision Systems
- Multi-Spectral / Multi Mission
Sensor Packages
- Fire Control Systems
- Long Range Surveillance Systems
- Helmet Mounted Displays
- Aerial Reconnaissance
- Mirrors & Windows
- Satellite & Space Based Optics
- Complex Electro-Optical Sensors



SWIR-MWIR-FLIR Coatings

FLIR 3-5 μm and 8-12 μm
 on Alcon, CaF₂,
 Chalcogenide Glass,
 Ge, Si, Spinel, ZnSe, ZnS

Metal Coatings

High Reflection Enhanced Al, Ag and Au
 On Glass, Aluminum, Nickel, Beryllium
 from 1 μm to 25 μm

Laser Damage Resistant Coatings

Anti-Reflection, High Reflection
 193, 248, 355, 532, 780, 810, 1064, 1570nm



Thin-Film Coatings

from 160nm to 16µm • high & low temperatures
on flat and curved substrates from Borofloat to Zinc Selenide

High Efficiency

R(abs) < .05%, R(ave) < .15%

High Damage Threshold
up to 2GW / Cm²

Quality Assurance (TQM)

MIL-145208

ISO 90001 Compliant • RoHS Compliant
ITAR Certified • DDTC Registered

Environmental Durability

MIL-PRF-675C • MIL-PRF-13508C

MIL-C-14806 • MIL-C-48497
MIL-F-48616

Applications

Digital Imaging • Information & Communication • Inspection & Detection • Laser Systems • Law Enforcement
Measurement Systems • Medical Imaging • Process Control • Surgical Equipment • Surveillance

Metals

Al • Ag • Au • Cr • Cu • Inconel • Ni • Pt • Ti

Specialty Coatings

for non-standard applications

Standard Coatings

Antireflection UV-NIR

Broadband AR's • MgF₂ • V-Coats • Wide Band AR's (3-1 bandwidth)

Industrial Coatings

Beamsplitters • Cold Mirrors (UV & Vis) • Color Separation Filters • Covert Filters • Detector Trimmers
Dielectric Insulators • Hot Mirrors (UV & Vis) • UV Blocking Filters • UV Transmitting Filters

Infra-Red Coatings

Broadband HR Coatings • Enhanced Multi-Spectral Metal Coatings
FLIR Coatings from 3-5µm, 8-12µm, 3-12µm, on CaF₂, Cleartran, Ge, Si, ZnS & ZnSe

Laser Coatings

High Reflectors from 193nm-2940nm • (single & multiple bands)
Non-Polarizing Beamsplitters • Short and Long Wave Pass Filters

Hard Gold Coatings

Mirror Substrate Materials:

- Silicon, Aluminum, Beryllium
- Fused Silica, Zerodur, Borofloat

Reflectivity (ave) > 98% from 7.0 µm to 14.0 µm

Salt Fog Coatings

"Coatings that resist salt fog"

Mirror Substrate Materials:

- Silicon, Aluminum, Beryllium
- Fused Silica, Zerodur, Borofloat

Reflectivity (ave) > 92% from 0.9 µm to 12.0 µm

Spectro Gold Coatings

"Broad Spectrum Reflectance, very cleanable coating"

Mirror Substrate Materials:

- Silicon, Aluminum, Beryllium
- Fused Silica, Zerodur, Borofloat

Reflectivity (ave) > 95% from 0.750 µm to 1.5 µm
AOI = 0-45 degrees

EMWIR

Substrate Materials:

CaF₂, Cleartran, Germanium, Silicon, ZnSe

%R(ave) < 1% from 2000-5000nm, AOI=0-5 deg

%T(ave) >98% from 2000-5000nm, through two surfaces

MWIR 1

Substrate Materials:

CaF₂, Cleartran, Germanium, Silicon, ZnSe

%R(ave) < 0.5% from 3600-5000nm, AOI=0-5 deg

%T(ave) >99% from 3600-5000nm, through two surfaces

SWIR

Substrate Materials:

CaF₂, Cleartran, Germanium, Silicon, ZnSe

%R(ave) < 1% from 800-2500nm, AOI=0-5 deg

%T(ave) >98% from 800-2500nm, through two surfaces

In-House Capabilities

Custom Coating Design • Prototype Development • OEM Production
Optical Fabrication • Environmental Testing (Humidity & Temperature)

Primarily Electron Beam

High Reflectors, Anti-Reflection • LWP • SWP
BP Filters • FLIR • Non-Polarizing Beam Splitter

Electron Beam with Ion-Assist

Low Temperature AR Deposition
Enhanced Metals for the IR

Metals-Resistance Boats and Electron Beam

Neutral Density Filters • Non-Polarizing Metallic Beam Splitter

Metrology

Perkin Elmer 1050 with URA 8-70 degrees

Shimadzu UV3101 with large optics module. Measure up to %T of 12"x12"

Perkin Elmer Frontier and GX Optical with 12, 16, 22, 30, 45, 55 degree attachments