DSI produces a wide variety of highly reliable, durable, and heat-resistant optical coatings. Our exclusive technologies and custom deposition chambers offer coatings from the ultraviolet (UV) through the longwave infrared (LWIR).

In addition to offering standard products, we work in close collaboration with our customers to develop innovative coatings that achieve specific requirements. Known for our strong engineering services, we seek to understand your needs and provide creative solutions for real-world applications.

SPECIALIZED COATING PROCESSES

DSI offers three coating technologies that accommodate the varied and often rigorous demands placed on thin film coatings. This comprehensive toolbox gives us the ability to provide unique solutions, higher performance, increased volume, and more durability in our coatings.

MICRODYN® REACTIVE SPUTTERING

The MicroDyn process is a short-throw reactive sputtering process. The process is highly flexible, with the capability to deposit metals, metal oxides, nitrides, mixed materials with fixed or graded compositions, and semiconductor materials. Selected coatings are capable of operating at temperatures as high as 1000°C and can withstand the thermal shock of direct transition from liquid nitrogen to boiling water. MicroDyn® coatings, including complex filters, can be patterned using both contact masking and photolithography.

ISODYN™ LOW PRESSURE CHEMICAL VAPOR DEPOSITION (LPCVD)

The LPCVD process is a thermally driven organo-metallic process that is configured to deposit multi-layers of silicon dioxide, tantalum oxide, and titanium dioxide. LPCVD is a high-temperature process (~500°C) that provides extremely conformal and seamless coatings on a wide variety of substrates including glass, ceramics, and metals. The unique aspect of the LPCVD process is its capability to uniformly coat all surfaces, even the most complex shapes with a high quality multi-layer optical coating. DSI’s ultra-durable optical coatings also feature laser damage threshold (LDT) levels as high as 25 MW/cm². These are ideal for use in laser and other high-energy systems such as gas, diode and diode-pumped solid-state (DPSS) systems.

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EVAPORATIVE COATING
DSI’s evaporative coating chambers are used for complex infrared coatings. Advanced thin film designs are deposited in precision, cryo-pumped vacuum chambers using electron beam guns and resistance sources with the option of ion assist. Coatings have minimum scatter and absorption, are space-qualified and meet all applicable military specifications. Infrared coatings with spectral performance requirements out to 15 microns can be produced. Metals, dielectrics and semiconductors are deposited on various substrates, including sapphire, silicon, germanium, zinc sulfide, and zinc selenide.

SERVICES
DSI has the expertise to participate at any level of your product development. From engineering to prototyping to full-scale manufacturing, we will work with you to develop practical specifications, designs, and manufacturing techniques to meet your requirements.

TEST AND MEASUREMENT
Quality testing capabilities include measurement of in-house produced materials as well as the independent verification of external coated and uncoated samples for vendor/supplier surveillance, process analysis, and qualification testing. Our quality system is ISO 9001:2015 certified.

A portion of our test and measurement capabilities are summarized here.

Spectral Measurement Capabilities:
- Reflectance and Transmittance
- Spectral Range 0.190 – 50 microns
- Multiple Angles of Incidence
- Temperature Range 15K to 335K
- Polarized Measurements (S&P)
- Hemispherical Transmittance and Reflectance (0.2 – 2.5 microns)

Environmental Testing:
Environmental Testing can be performed in accordance with various military specifications, including MIL-C-48497 and MIL-F-48616.

- Humidity
- Salt Fog
- Adhesion
- Abrasion
- Solubility & Cleanability
- Temperature Cycling
- Surface Quality
- Surface Resistivity
- Dimensional Verification
- Surface Roughness

Physical:
- Flatness, Reflected Wavefront
- Error, & Transmitted Wavefront Error on up to 4” diameter samples

Substrate Materials:
- Ceramics
- Germanium
- Glass
- Flexible Sheets (e.g. Kapton®, Mylar, Halar®, etc.)
- Sapphire
- Silicon
- FPAs
- Zinc Sulfide / Zinc Selenide
- Fused Silica