



Deposition Sciences, Inc.
Quality Coating Solutions

PATTERNED THIN FILM OPTICAL FILTERS

Technical Data Sheet



PROCESS/PRODUCT DESCRIPTION

DSI's photolithography capability produces patterned thin film coatings (including bandpass filters, dark mirrors, and metals) on substrates up to 8 inches in diameter and either plane parallel or wedged.

DSI's processes enable high placement accuracy, the ability to accurately maintain coating spectral properties at the smallest geometries, and two-sided patterning capabilities (for windows). DSI utilizes both positive and negative resist processes, and particularly specializes in supporting customers in the development of coatings for unusual or challenging geometries.

PATTERNED FUNCTIONALITY

- Apertures/Picture Frames
- Fiducials
- Slits

APPLICATIONS

- Multispectral sensing/imaging
- Remote Sensing
- Aerospace

TECHNICAL SPECIFICATIONS

When developing a patterned filter, several variables must be considered, including:

- Spectral requirements for the coating(s) being deposited
- Feature sizes
- Alignment requirements of the features
- Substrate size
- Substrate material
- Number of different filters/coatings being deposited and patterned

Spectral requirements of the filter can affect the size and positional accuracy of the features. More challenging optical filters require more layers to achieve required spectral performance. These layers result in coatings with significant physical thickness. Generally speaking, as the coatings become thicker, they are more challenging to pattern.

General characteristics of DSI's patterned filters are summarized in the table below.

Parameter	Specifications*
Minimum Line Width	20 μm
Dimensional Accuracy	$\pm 5 \mu\text{m}$
Feature Placement	$\pm 5 \mu\text{m}$
Front to Back Alignment	$\pm 10 \mu\text{m}$
Largest Substrate Size	200 mm Diameter, 127mm Square
Substrate Thickness	0.0762mm to 8mm
Common Substrates	Fused Silica, Glasses, Gallium Arsenide, Germanium, Indium Phosphide, Sapphire, Silicon, Zinc Sulfide
Maximum Coating Thickness	20 μm
Resist Types	Positive and Negative

*The above specifications are to be used as nominal values only. Filter complexity, physical thickness and uniformity requirements need to be considered before actual values can be determined.

All patterns and optical thin films are designed for specific applications. DSI engineers work closely with customers to design the optimal combination of performance, delivery, and cost. Let us engineer a solution for you.