

Dual-Band Infrared Bandpass Filters

Dual-Band IR filters for the MWIR and LWIR provide high performance in-band and out-of-band



Image courtesy of FLIR

DESCRIPTION

Reynard dual-band infrared (IR) bandpass filters provide high in-band transmission in both the MWIR (mid-wave, 3-5 μ m range) and the LWIR (long-wave, 7.5-13.5 μ m range) simultaneously, while providing high out-of-band (OOB) rejection.

In-band transmission levels above 90% have been demonstrated on multiple substrate materials with different wavelength and transmission performance requirements.

MIL-STD environmental testing has verified excellent durability and stable spectral performance. Direct spectral measurement at 80K (LN₂) demonstrates cryogenic temperature durability and minimal wavelength shift from ambient conditions (dx/dT).

Coatings can be applied to small or large substrates with plano or curved surfaces, all with excellent part-to-part and edge-to-edge uniformity.

These coatings are ideal for current and next-generation infrared imaging systems that require high-performance in-band and out-of-band blocking in multiple wavelength bands.

Reynard can customize any filter to meet the performance needs of your system. All manufacturing is done in-house for improved quality, ease of communication and innovative customization.

KEY SYSTEM BENEFITS

REDUCE OVERALL SYSTEM WEIGHT

A dual-band optical system requires fewer optical elements compared to multiple, single-band systems. A smaller solution resulting simpler imaging applications.

BETTER PERFORMANCE

Meets demanding IR system requirements with minimal layers that are stable & durable.

FLEXIBILITY

Allows the use of color cameras for both day and night imaging when there are ambient light conditions.

LOWER SYSTEM COST / AFFORDABILITY

Combining multiple optical functionalities into a single optical path can reduce procurement costs, inventory management costs and assembly costs.

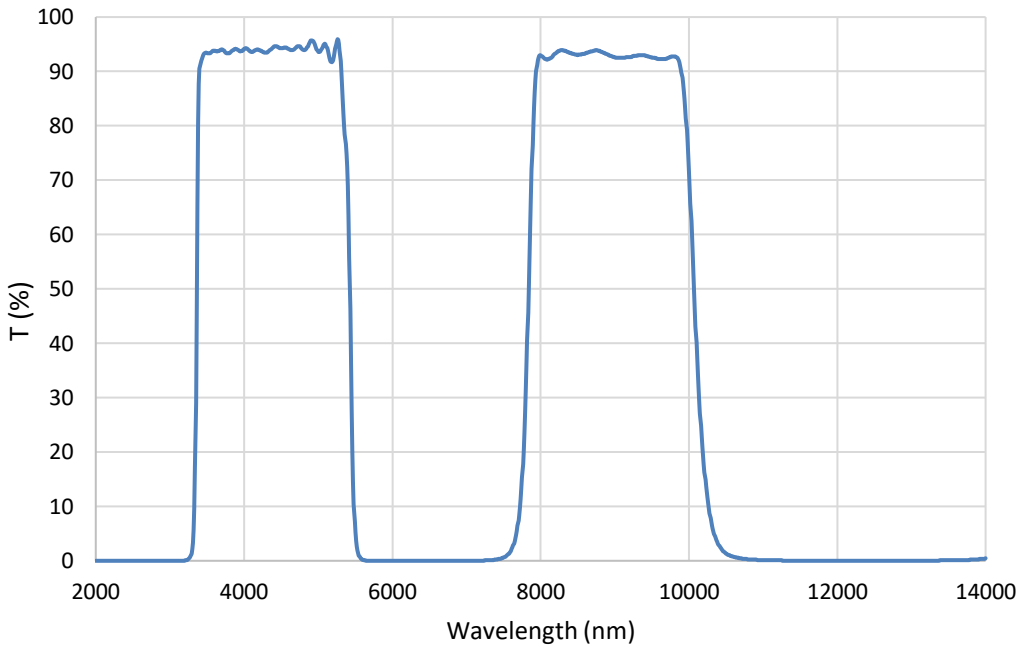
ENVIRONMENTAL

Able to withstand MIL-SPEC environmental testing including humidity, temperature, abrasion (moderate), and adhesion.

BETTER IMAGING

Ensures clear and accurate images under most lighting conditions without using costly filter switching mechanisms.

Theoretical model for dual band pass filter at 80K temperature



SPECIFICATIONS:

Property	Value
Material	Ge, InAs, ZnS, ZnSe and others
Size	Custom upon request
Surface	Plano, Convex, Concave Polished edges/chamfers available
Surface Quality	Per MIL-C-48497/48616(MIL-PRF-13830) Standard: D-C (40-20) Limit: B-A (10-5)
Wavelength Band	3.0μm to 5.0μm 8.0μm to 13.5μm
Spectral Performance	0° AOI T _{avg} (inband) > 85% OD _{avg} (OOB) > 2 T _{max} (inband) > 95% OD _{max} (OOB) > 4
Environmental	MIL-C-48497A 3.4.1.1 – Adhesion 3.4.1.2 – Humidity 3.4.1.3 – Abrasion (moderate) 3.4.2.1 – Temperature Cryogenic cycling to 80K
Damage Threshold	Laser Damage enhanced designs available; design specific. Testing will be provided.

KEY FEATURES:

- MWIR/LWIR spectral discrimination on a single substrate.
- Custom tuning to specific wavelength band requirements available.
- Deposition on a variety of IR materials.
- Substrate configurations include large and small aspherical, lenses, flats, and spherical.
- Environmentally durable.
- Prototype to production volumes.
- Build-to-print manufacturing.

APPLICATIONS:

- Current and 3rd Gen FLIR Instruments
- Night imaging
- Gas sensing
- LIDR
- UAV's
- Imaging through smoke and fog
- Target detection and identification
- Weather Imaging
- Detection
- Thermal Imaging
- Avionics
- Security