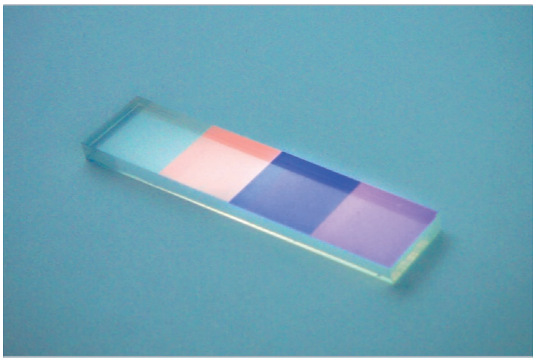
High Precision Order Sorting Filters

High-order suppression in grating-based optical systems

Grating-based optical instruments play a crucial role in a vast range of optical systems. However, the use of diffraction gratings introduces higher diffraction orders that must be addressed. One method to suppress these orders is through a strategic placement of several longpass filters. These filters must have a highly transmitting passband, along with an efficient suppression in the blocking band. Using photolithography, multiple filters with a transition zone of less than 10 µm can be patterned on a single substrate. Additionally, linear variable filters are available for integration into high-end spectrometers. On request, all order sorting filters may be combined with the renowned Gelot™ coating for hermitically sealing the detector.



Benefits

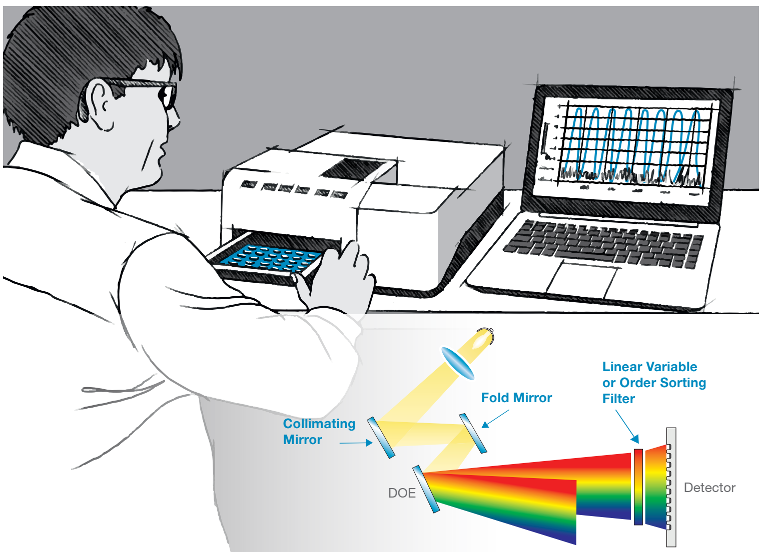
- Customized filter size and design
- Entirely coated, patterned or linear variable filters
- High transmittance in the passband
- Long-term shift-free spectral performance
- Extreme environmental stability
- Compact and cost-effective configuration
- Enables instrument designs with no moving parts for fastest data acquisition

Applications

- «Grating-based» optical devices, e.g. miniature spectrometers
- Sensing, metrology, astronomy

Technical Data

Wavelength	available from UV to NIR range (e.g. 260 nm, 380 nm, 605 nm, 900 nm) or as a continuously variable version (LVF)
Blocking	OD3 – OD8
Transmittance	Tave > 95 % (depending on wavelenght range)
Dimensions	per customer request
Parallelism	< 3 arcmin
Surface Defects	e.g. 5 / 1 x 0.1 per ISO 10110-7 or 20-10 per ML-PRF-13830B
Environmental Stability	Temperature - 100 ... + 150 °C Humidity up to 99 %
Transition zone	< 10 µm (conventional OSF) None (Linear variable Filter)



Application Spectroscopy

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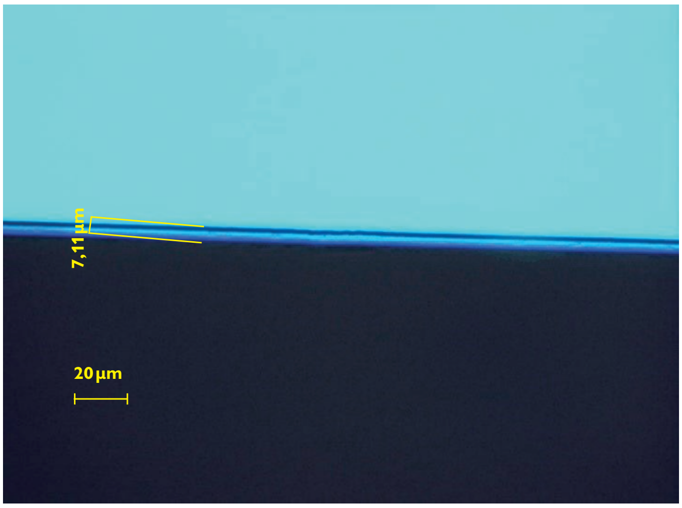

Fig. 1: Using a lithographic approach, a transition region < 10 µm can be achieved between different zones.

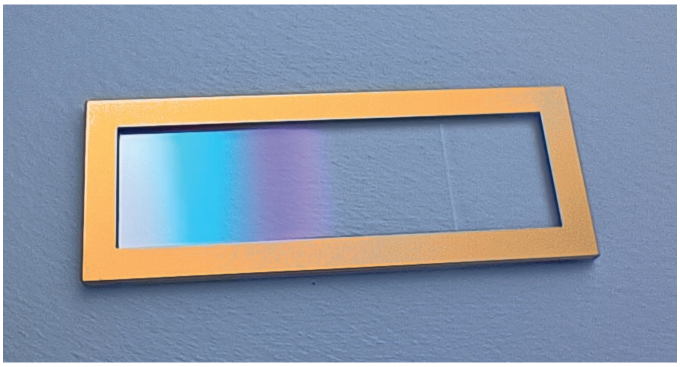

Fig. 2: On request, all filters may be combined with our solderable Gelot™ coating for hermetically sealing the detector.

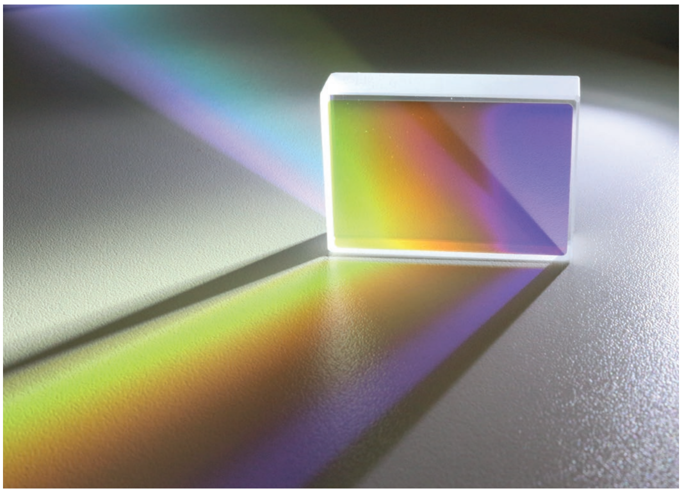

Fig.3: Using a linear variable filter (LVF) instead of a traditional multi-zone filter allows to get rid of all transition regions as the spectral performance varies continuously depending on the lateral position on the filter.

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Highly transmitting Order Sorting Filter with borad transmission band

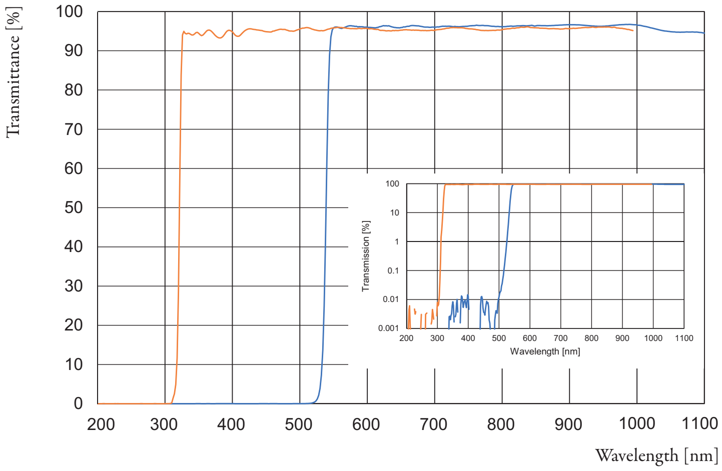

Fig. 4: Measured spectral transmittance of a VIS-Order Sorting Filter with broad transmission bands. Inset: the blocking power is OD4.

High Precision Longpass Filter for IR application

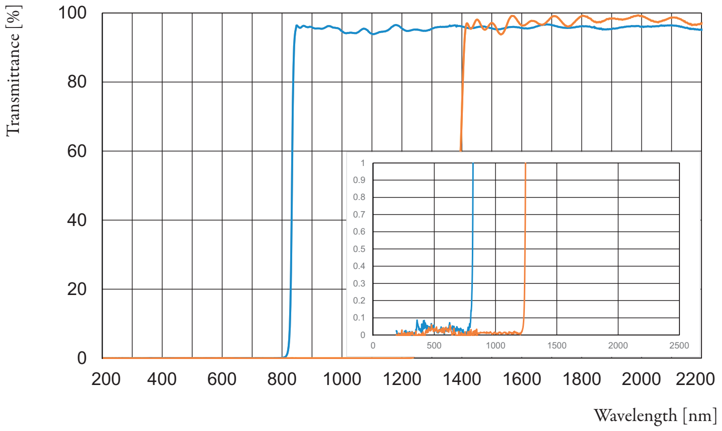

Fig. 5: Measured spectral transmittance of a NIR-Order Sorting Filter. Inset: blocking performance.

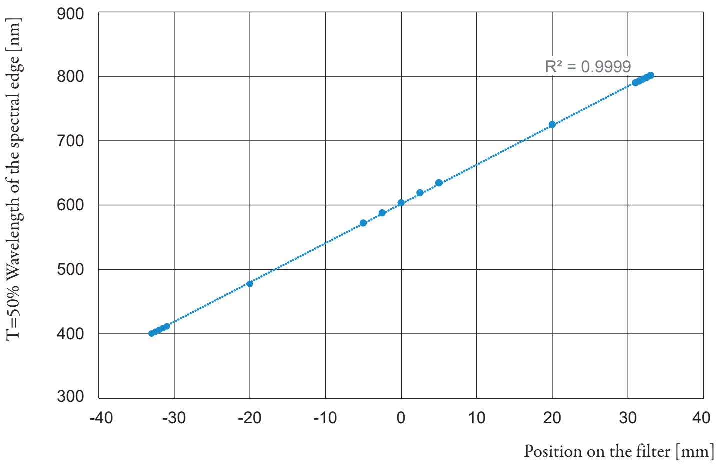

Fig. 6: The spectral performance of an LVF depends linearly on the measurement position.

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