



Recent Examples of Advanced Optical Filter Designs Achieved Using PARMs (Plasma Assisted Reactive Magnetron Sputtering)

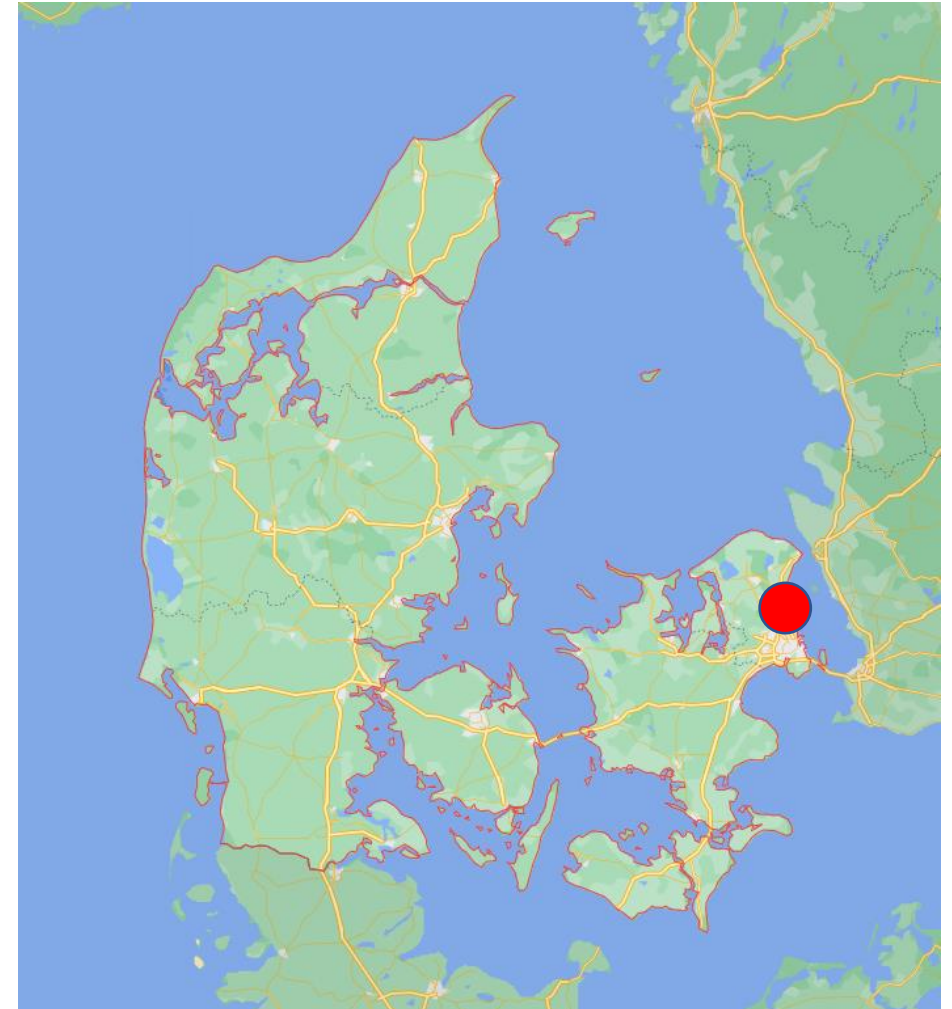
Dr.-Ing. Oliver Pust

Delta Optical Thin Film A/S

WE ARE THE OPTICAL FILTER COMPANY.

Delta Optical Thin Film in brief

- ▶ We focus 100% on design and manufacturing of optical thin film components
- ▶ We focus on volume manufacturing for OEM customers
- ▶ We are a pioneer in interference filters for fluorescence applications – around since 1970
- ▶ Headquarters in Hørsholm, Denmark
- ▶ The leading supplier of Continuously Variable Filters
- ▶ Manufacturing 24/5



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Delta Optical Thin Film Today

- New global 2,300 m² headquarters since August 2020
- Improved clean room with space for further expansion
- Equipped with latest Magnetron Sputter coating technology
- Ultrasonic washing line based on environmentally sustainable chemicals
- 1,000 m² solar panels on roof. All other electricity supplied by wind power for minimum carbon footprint
- Introduction video to our new facility:
<https://youtu.be/kDf-GkWiwqo>



Current technology



- ▶ Proprietary design and control software enables performance not achievable with off-the-shelf solutions
- ▶ Several Bühler Leybold Optics SYRUSpro 1100 with proprietary optical monitoring system
- ▶ Bühler Leybold Optics Helios 800+ enabling for example steep multi-bandpass filters with deep broad-band blocking
- ▶ Factory has room for further expansion



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Why Helios 800+

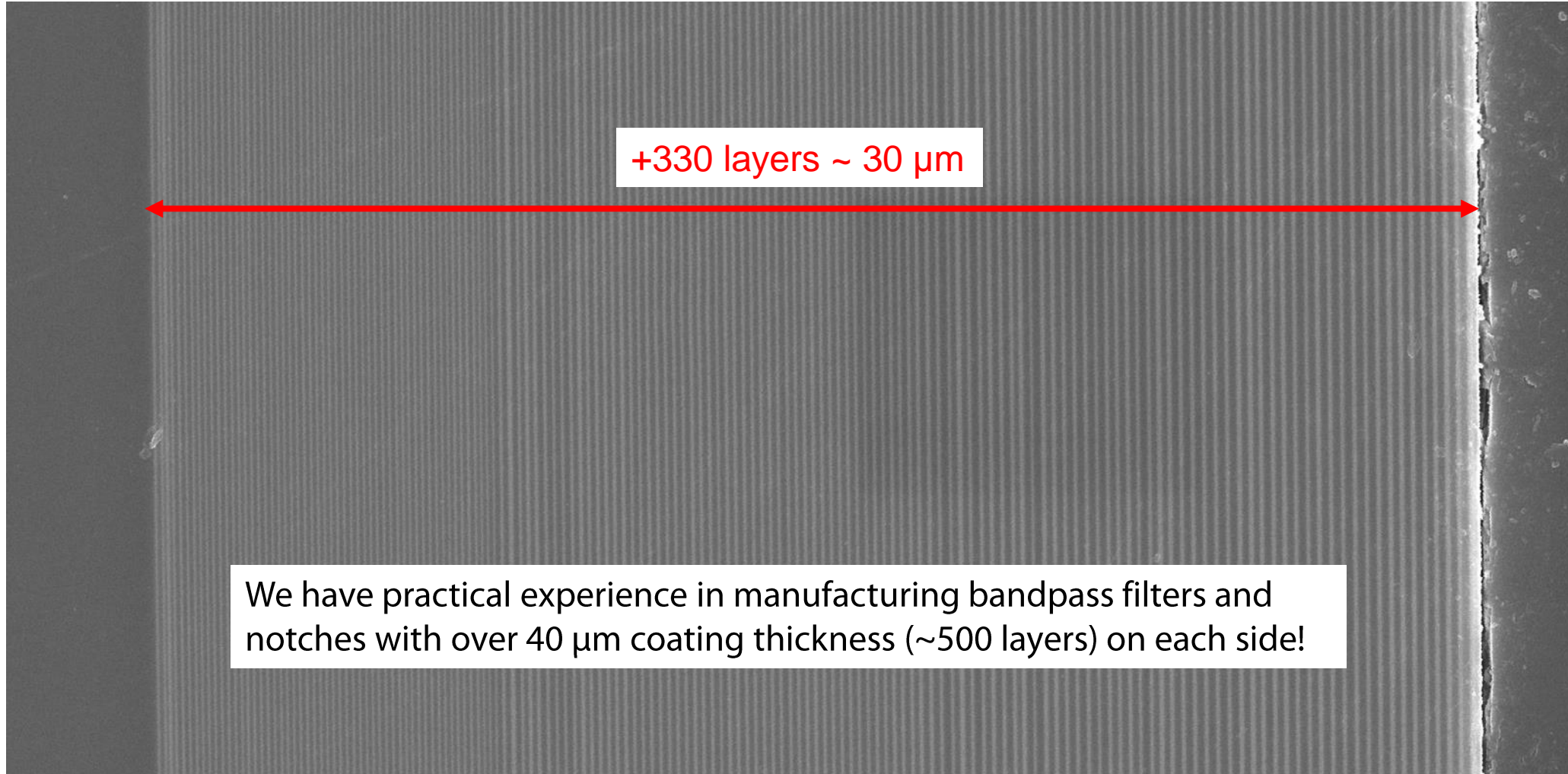


- △ We have long seen an increased demand for fluorescence filters with utmost performance that cannot be manufactured on SYRUSpro coaters
- △ We wanted a solution for providing filters with:
 - △ Transmission approaching 100%
 - △ Very deep blocking (>OD6 in the complete silicon range)
 - △ Very high steepness and narrow FWHM
 - △ Specs comparable to IBS filters at more attractive prices
- △ We have followed the Helios platform for more than a decade, and with the introduction of Helios 800+ we found the technology sufficiently mature



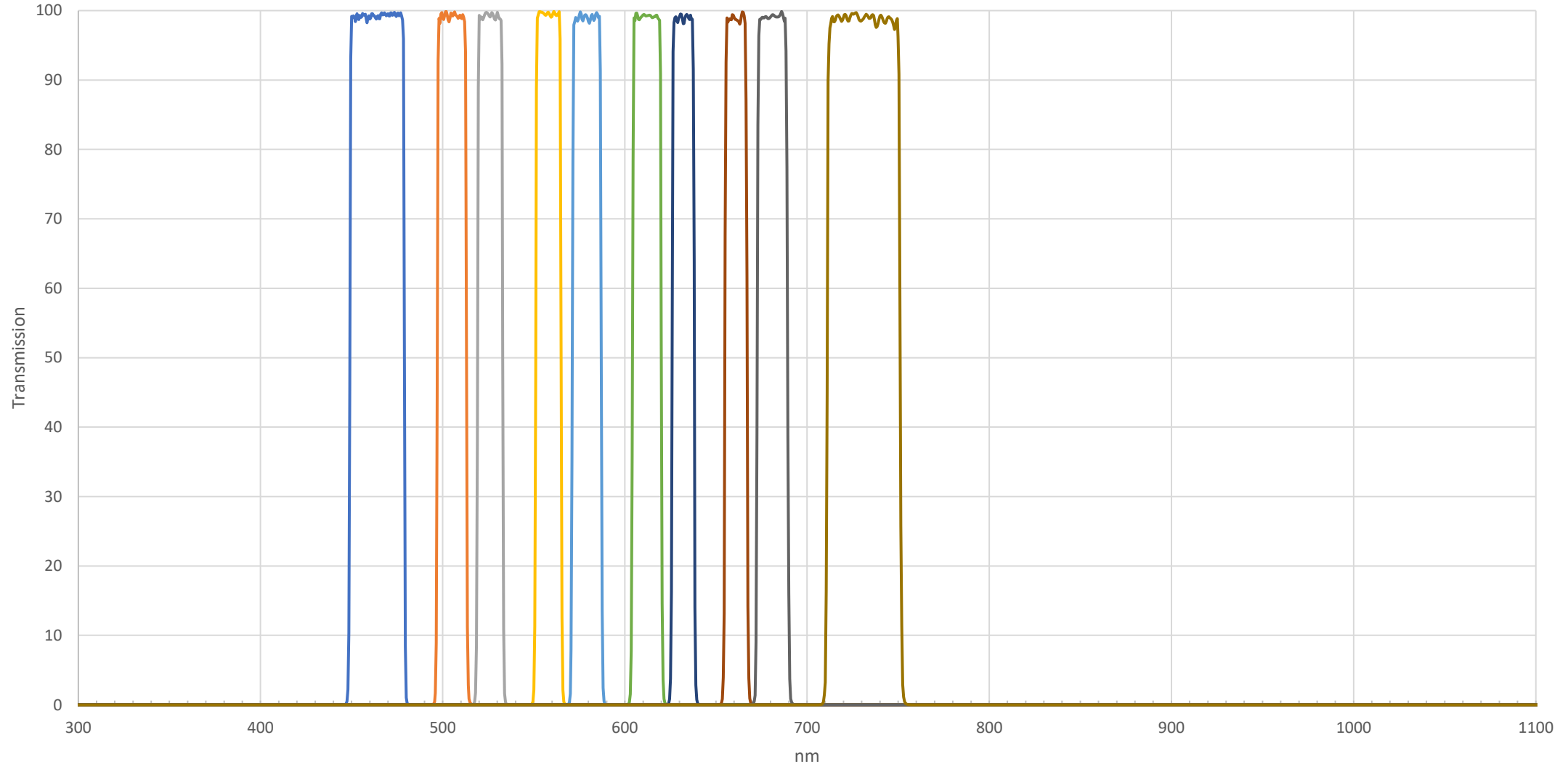
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SEM image of filter cross-section



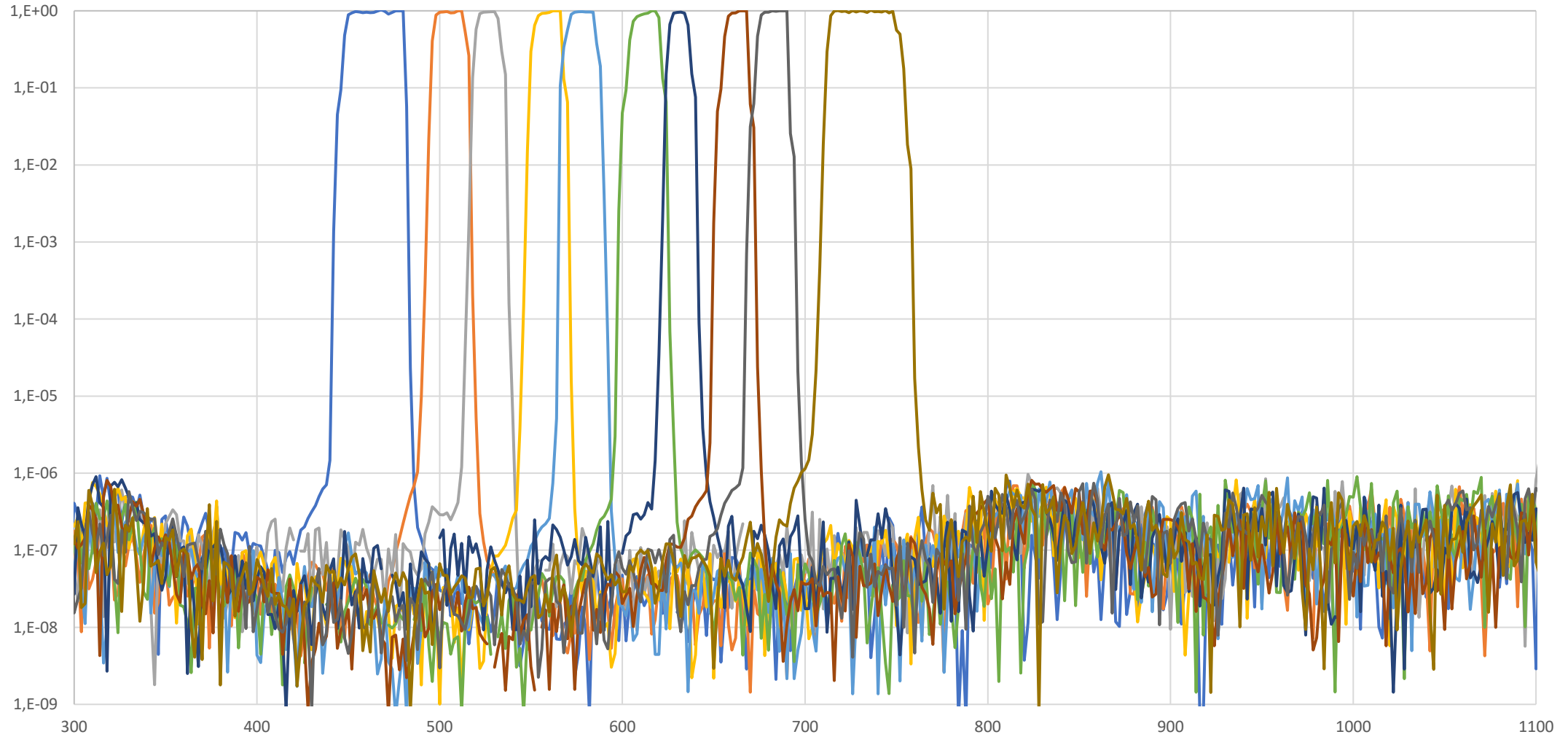
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Recent PCR filter set manufactured on Helios by Delta



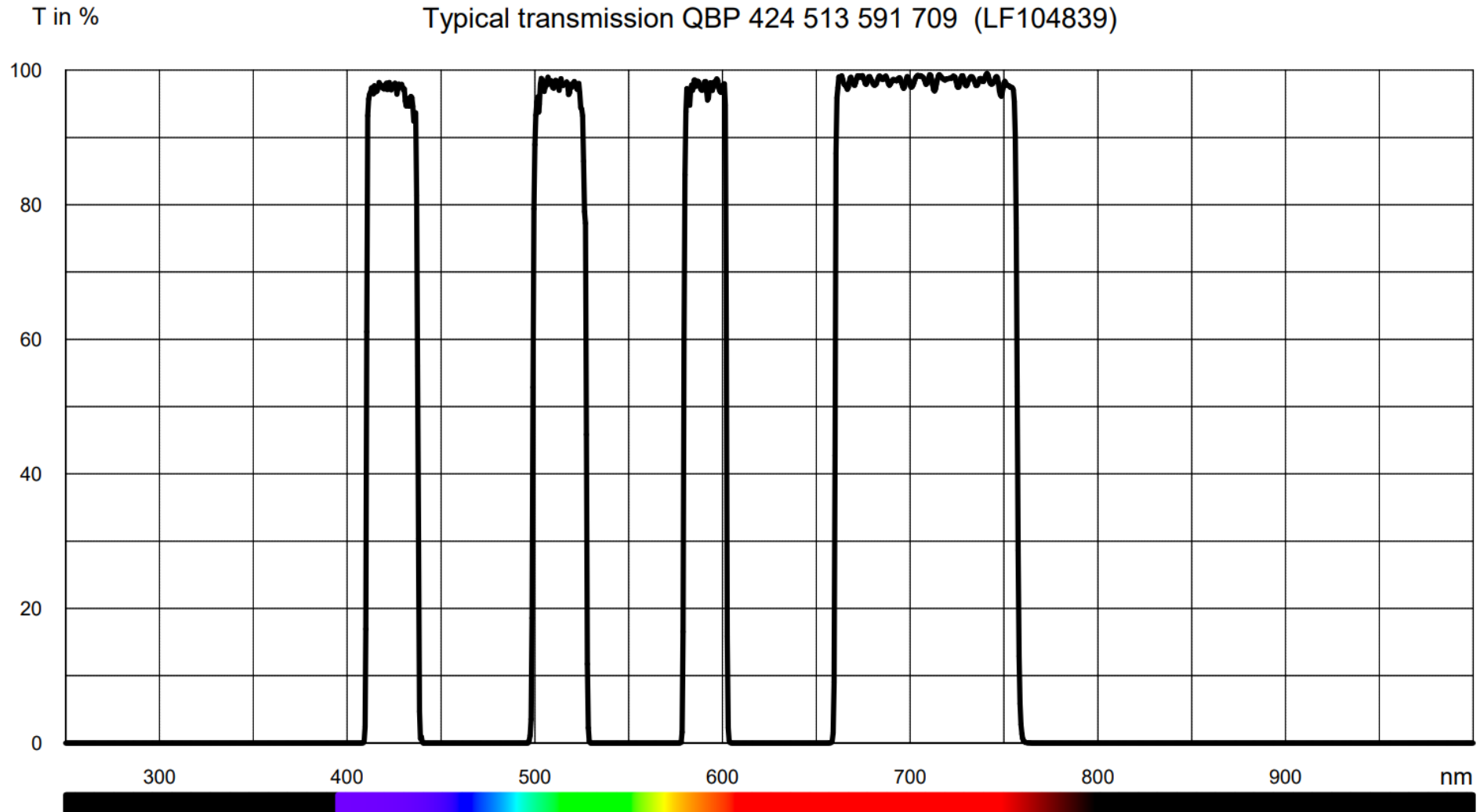
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Measured spectral blocking



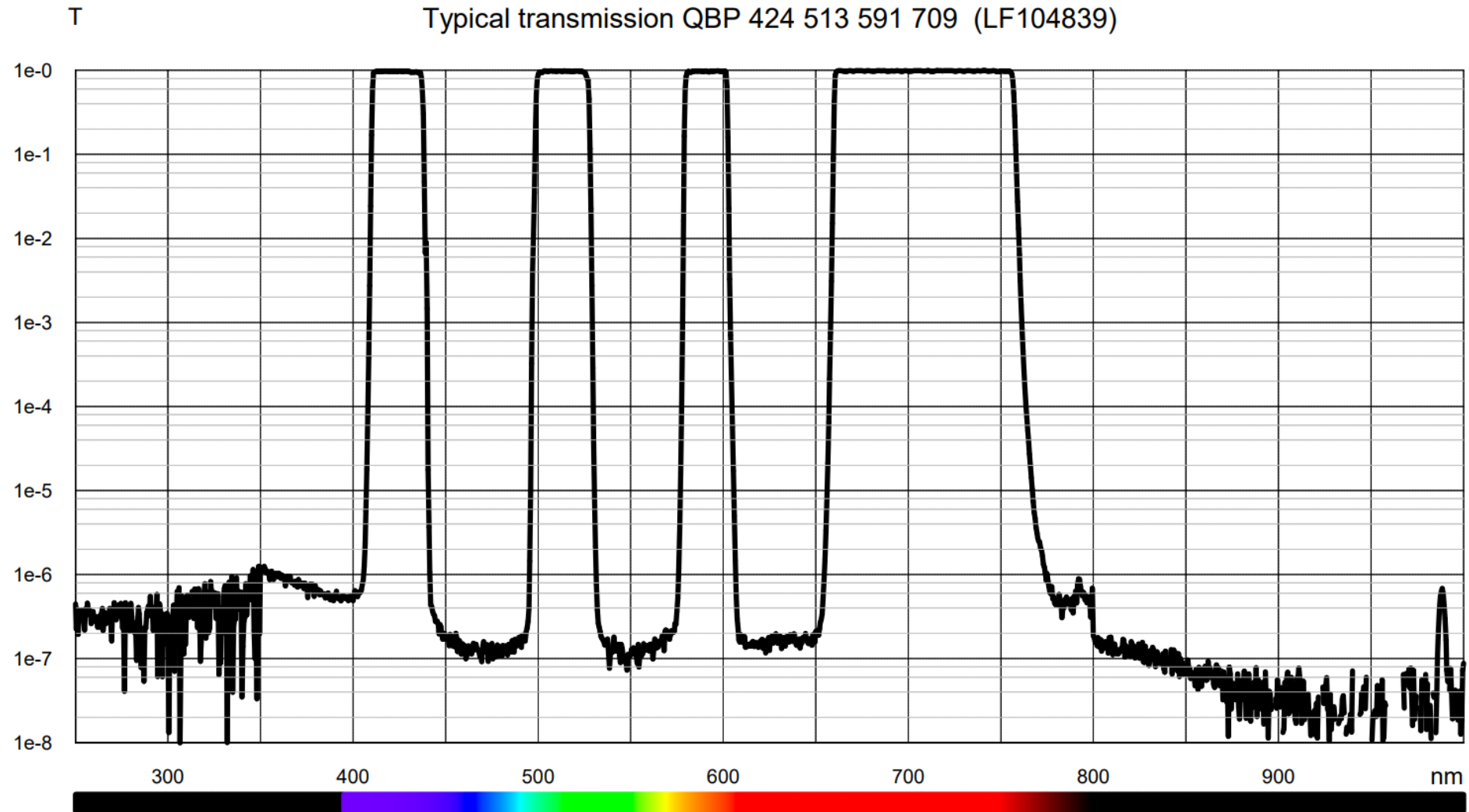
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Recent Multi-Bandpass Filter



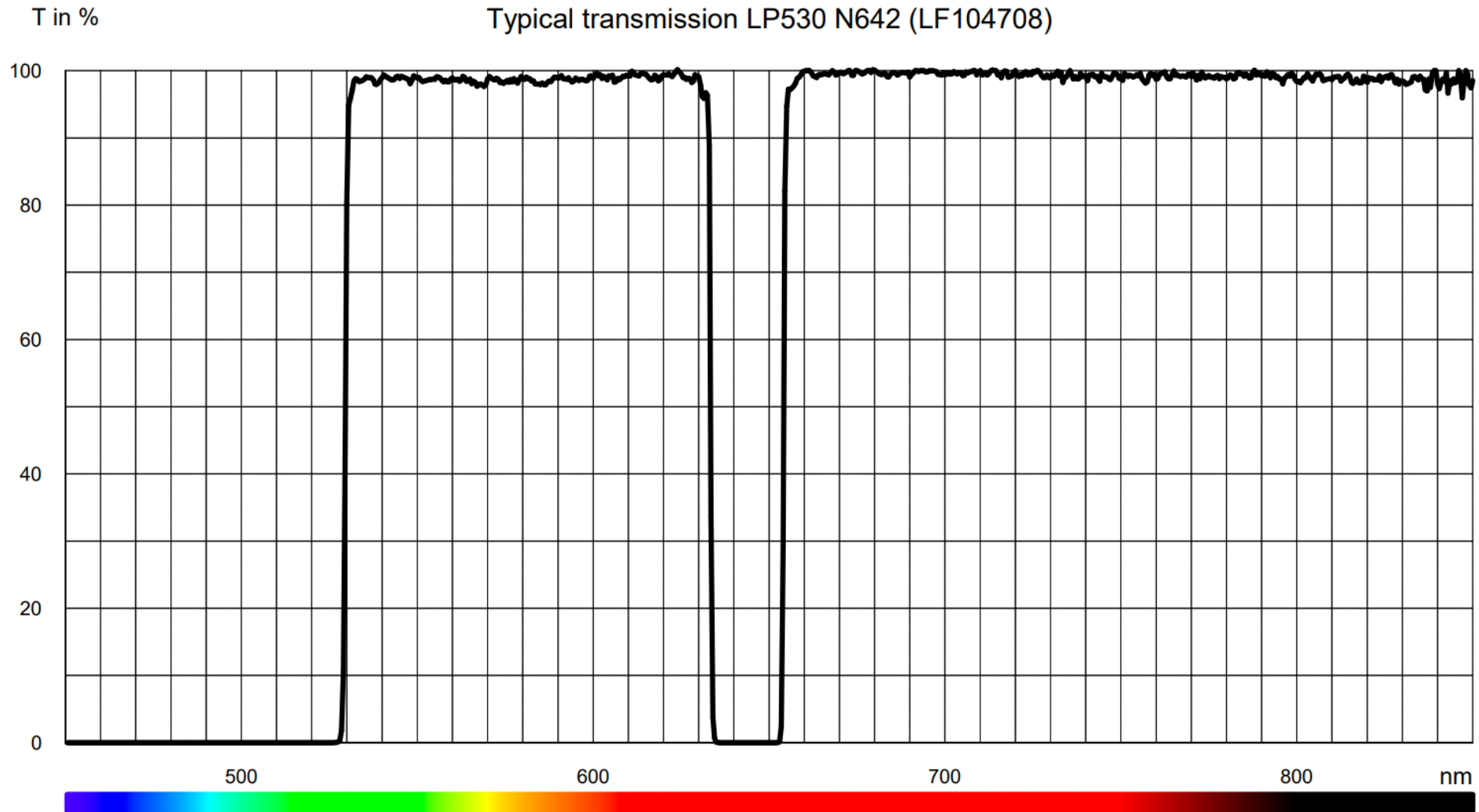
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Measured spectral blocking



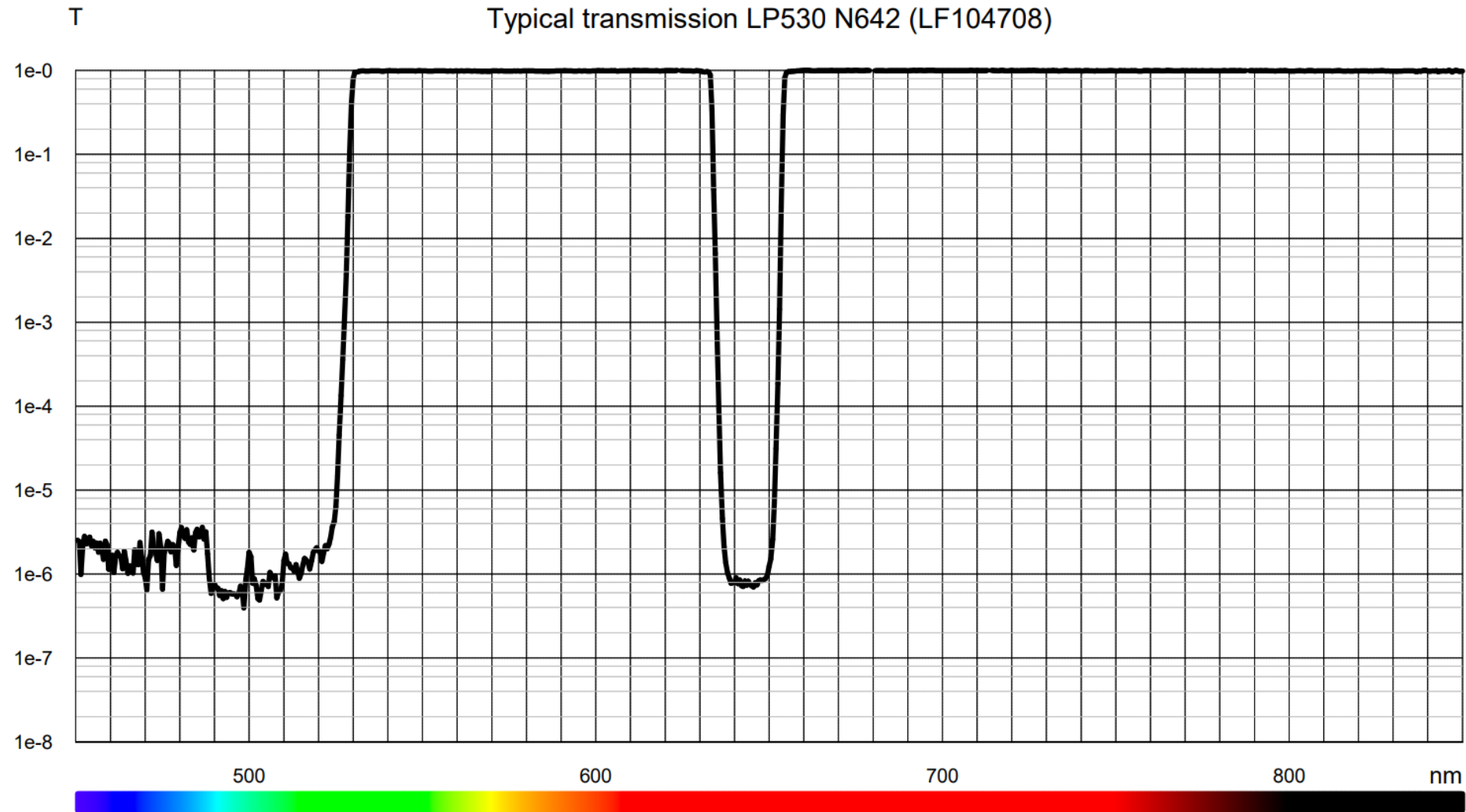
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Recent Notch Filter



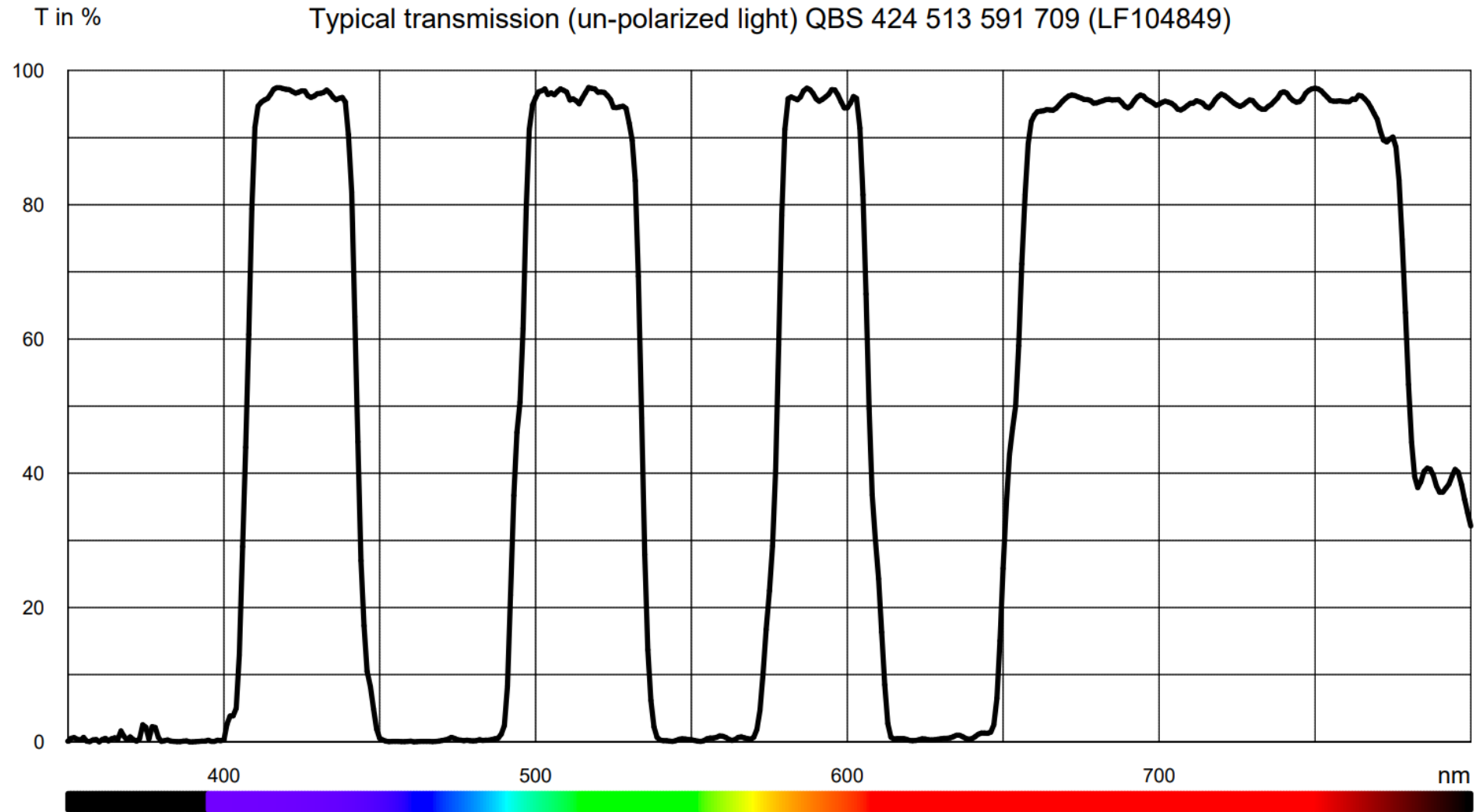
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Measured spectral blocking



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Recent Multi-Band Beamsplitter



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Thank you very much for
your attention!

Questions?

See us at booth E14A!



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