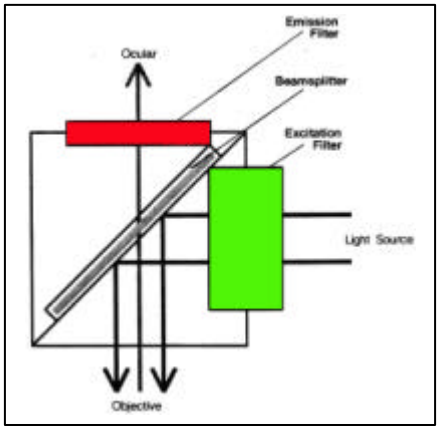
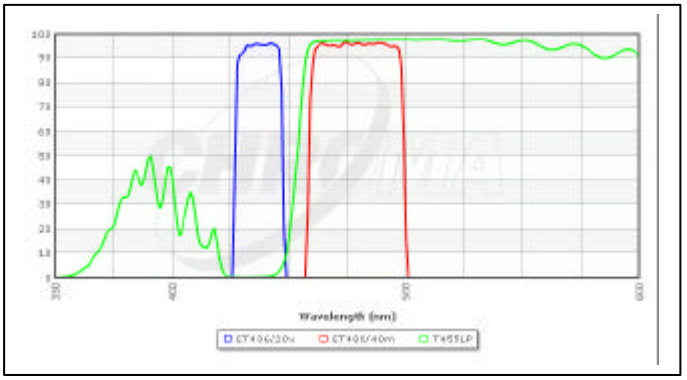
Filterset

Understanding Filter Spectra

More and more demanding fluorecence applications in the field of biology and medicine require better optical filter systems. Increased brightness without a corresponding increase in noise or undesired background is impossible without optimized filtersets. Filters with steep pass bands are essential for new fluorochroms with very short Stoke´s shift. New automatic image acquisition and screening systems need this filter quality for separation of signals from multi-stained samples without loss of throughput.
Visitron Systems GmbH offers a large variety of filtersets for nearly all established applications. On demand we provide the complete mounted filter cube or slider for all major brands of microscopes and filter wheels (Zeiss, Leica, Nikon, Olympus, Ludl, Sutter, Cairn)

A fluorescence microscope usually contain three parts in a filter system. An excitation filter, an emission filter and a dichroic beamsplitter. The dichroic beamsplitter is a coated optics that reflects excitation light and transmit emission light.





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Correct mounting of filterset into filter cube:

Orientation:

Proper orientation of the filter is necessary in order to minimize autofluorescence and maximize performance. Please take a moment to locate the caret (arrow) located on the edge of each filter.

Excitation (x) filters should be positioned with the caret pointing toward the specimen and the inside of the cube, and away from the light source.

Emission (m) filters should be positioned with the caret pointing toward the specimen and inside of the cube, and AWAY from the detector / eye.

Dichroic mirrow (bs) should be mounted with the coating surface TOWARD the light source, excitation filters and specimen. The coating side will be identified with a caret pointing to it, or a bevel. The beveled side is the smaller surface.

Cleaning and Handling of filters

Handle coated pieces by the edges only. Clean gently only if necessary. Loose particle should be removed with bulb puffer filtered pressurized air cleaner. If necessary, gently wipe surface using anhydrous alcohol and lint free lab towels. Use a new surface of towel with each wipe.

Avoid touching or wiping A/R coated or metal mirror surfaces !

Avoid handling exposed coatings with bare fingers !

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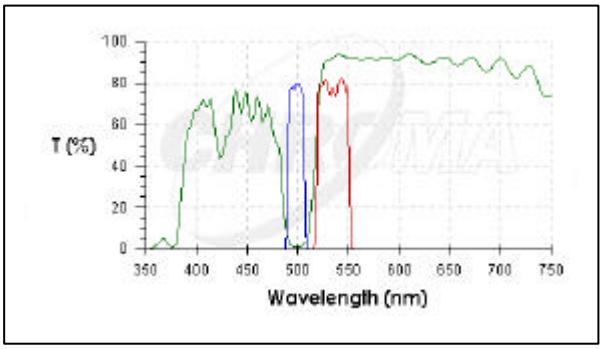
Optical Filter with different quality / transmission – from standard, HQ- quality to hardcoated.

Typical Filter curve for Excitation and Emission Spectra

High-Q – Filterset

- with steepest passband
- recommended for dyes with short Stoke´s shift

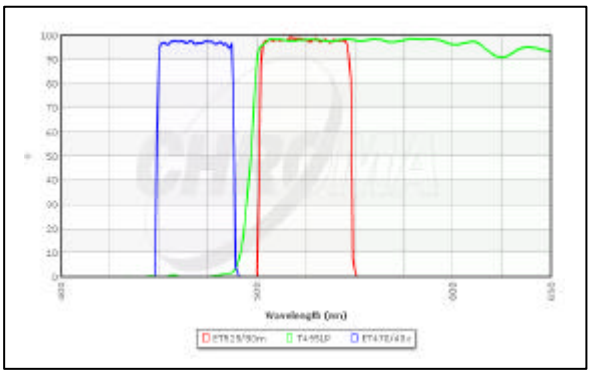
Example: Yellow GFP



Hardcoated Highest Transmission

- optical filters with highest spectral performance
- very steep edges, highest transmission, high blocking
- no pixelshift within one filterseries
- high thermal and mechanical resistance

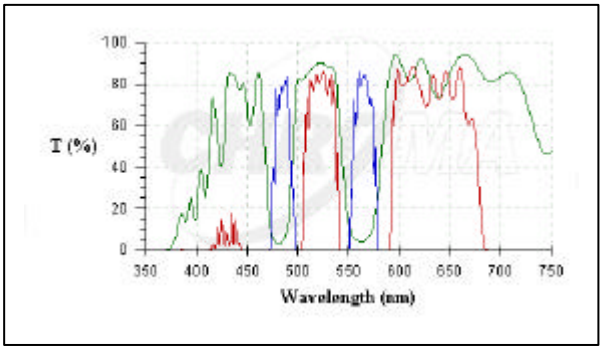
Example: GFP



Dualband – Filterset

- simultaneous measurement
- of two dyes

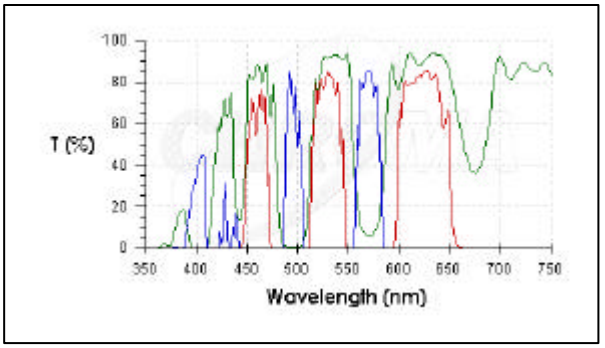
Example: FITC and Cy3



Tripleband – Filterset

- simultaneous measurement of three dyes
- minimum overlap

Example: DAPI, FITC and Texas Red



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