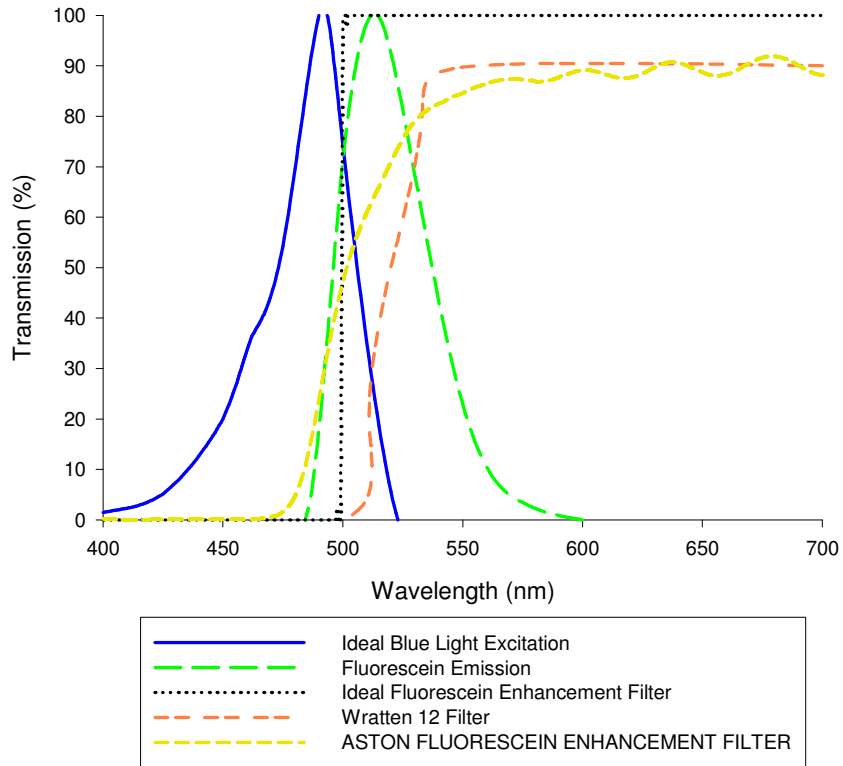


Aston Fluorescein Enhancement Filter

The use of fluorescein, a fluorescent dye which absorbs blue light and fluoresces green, is well established for studying ocular fluid dynamics. Applied topically to the ocular surface, it mixes with the surrounding tears highlighting the dynamics and volume. The change of concentration of fluorescein in the tear film is correlated to ocular irritation symptoms and eyelid and corneal disease.¹ The fluorescein in the tears diffuses into intercellular spaces, such as defects in the tight junctions (zonulae occludens) of the basal epithelial cells or cellular spaces (resulting in punctate staining). Fluorescein cannot penetrate intact cell membranes, but once fluorescein gains entry it diffuses freely into the interior of surrounding cells by passing through junctional surfaces.²

To optimally view the fluorescein mixed in the tear film and staining of the ocular surface, a blue excitatory light source is used. This needs to have a wavelength optimum for absorption by the fluorophore (490-500nm), with minimal power at wavelengths emitted by fluorescence of the fluorophore (510-520nm) or near the peak of the blue light hazard (430nm).³ These wavelength requirements are not altered by the pH of tears within the clinical range.^{4,5} Peterson, Wolffsohn and Fowler (2006) showed that cobalt blue used by many slit-lamps is far from optimal and has a peak transmission close to the blue light hazard wavelength.⁶ A short-wavelength barrier filter to reduce overlap between the excitation and emission spectra is essential to visualising fluorescein. These are often referred to as a Wratten filter, but this is a range of filters by Kodak encompassing a diverse range of colours. A Wratten 12 is the closest of this range to the yellow 500nm cut-off required, but is not optimal.⁶ Hence Wolffsohn and colleagues sourced a better filter, available as the Aston Fluorescein Enhancing filter available exclusively through the Bausch and Lomb Academy of Vision Care.





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