

High Performance Thin Film Optical Coatings Technical Capabilities

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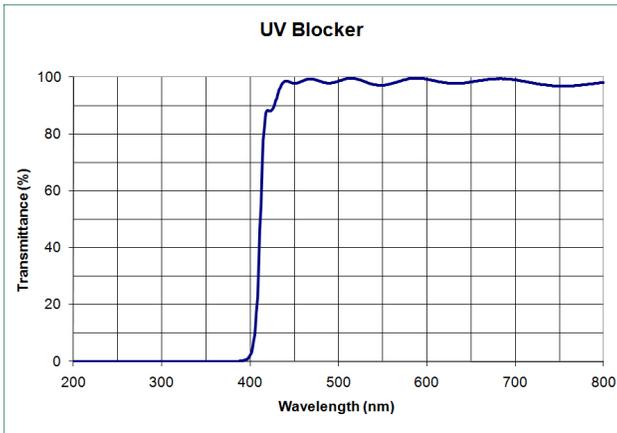
Coatings Capabilities

UV Filters - Blocking, Blacklite™ and 470 Short Wave Pass (SWP)

Managing ultraviolet (UV) light exposure is critical in a wide variety of applications including some necessary to life. ZC&R has a several standard coatings designed to manage UV light for a wide variety of applications. Overexposure to UV can cause skin and eye damage requiring windows and other glass surfaces to be used for protection. Similarly, UV exposure can also damage artwork, documents, and other ink based items we might expect to find behind UV blocking glass generally found in museums. On the other hand, there is our need for UV exposure in moderation for processes such as vitamin D synthesis. UV exposure is also used in curing applications, fluorescence microscopy for cellular imaging, and even Blacklite lamps for entertainment venues.

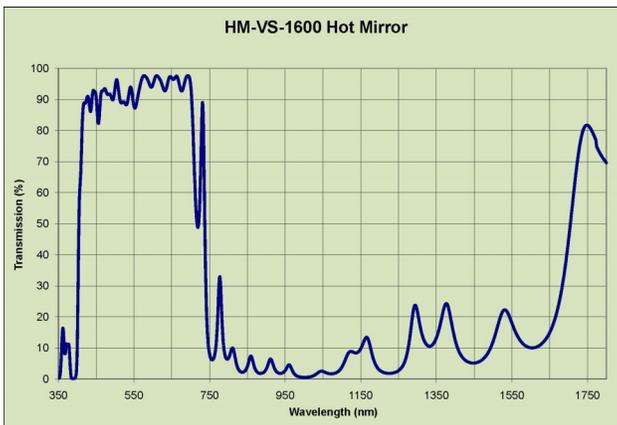
Specifications:

Substrate: Borofloat[®] - Borosilicate and other standard glass substrate materials
Thickness: 0.125" (3.175mm) - custom thicknesses available
Size: Up to 24" (609.6mm) diameter max.



UV Blocking Filters

Our UV Blocker coating is used in a variety of UV sensitive applications. Examples include protection of artwork in museum displays, liquid crystal devices, and UV sensitive optical fibers.
 Average T ≤ 1% 200-390nm
 Average T ≥ 90% 430-700nm



HM-UV-1050 UV Pass Hot Mirror

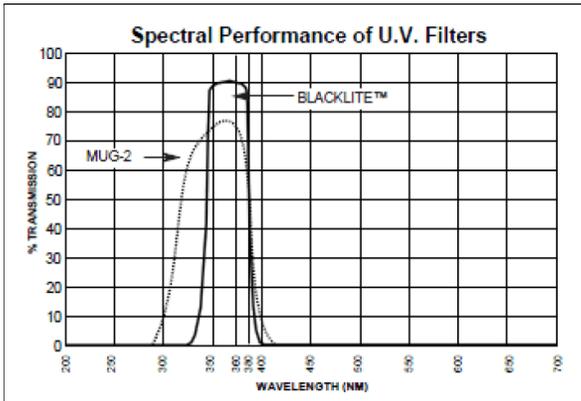
UV Hot Mirror filters are specially designed to transmit more than 80% on average from 245-460nm and reflect more than 70% in average from 800-1050nm at normal incidence. Custom angles of incidence can be designed to specification.

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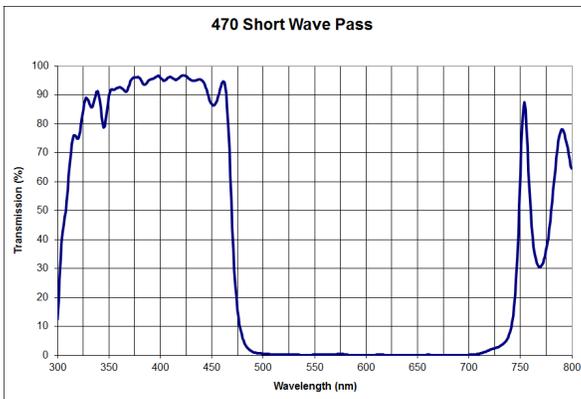
Coatings Capabilities

UV Filters - Blocking, Blacklite™ and 470 Short Wave Pass (SWP) - *continued*



Blacklite™ UV Filters

Blacklite™ filters are all dielectric thin films on borosilicate glass and offer some additional features over MUG-2 filter glass. The transmitted efficiency is superior, which is critical in areas such as forensics, fluorescence and inspection. Because this is a coated filter, rather than an absorption based filter glass, heat produced by the light source is allowed to exit through the filter. This lowers overall system temperature and can extend lamp life. Additionally, in high temperature applications where tempered MUG-2 is not adequate, Blacklite™ may be suitable due to its Borofloat[®] substrate.



470 Short Wave Pass (SWP) Filters

470 SWP filters are often used in fluorescence microscopy and other applications where near UV and blue pump wavelengths are required. Our 470 SWP filter passes an average of 85% of energy from 340nm-450nm wavelengths. Average transmittance from 500nm-700nm is reduced to less than 0.5%. Performance is specified at normal incidence. This coating is typically provided on Borofloat[®] glass but can also be coated onto fused silica or other UV transmissive glass materials.