



stabledge® optical filters

FILTER DESIGN

Superior Wavelength Control at Any Angle

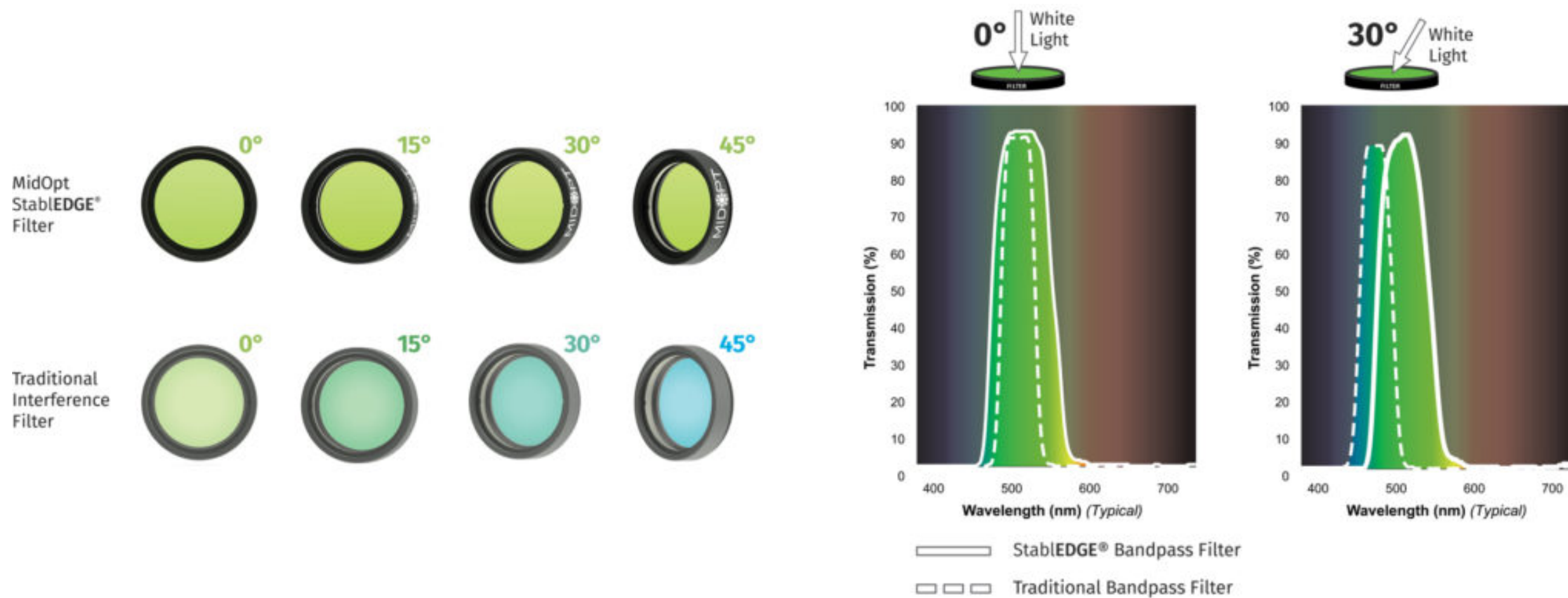


Minimize the Effects of Short Shifting

StableEDGE® optical filters are specifically designed to be less susceptible to effects from angular shifting seen when optical filters are placed in front of short focal length (<12mm) camera lenses.

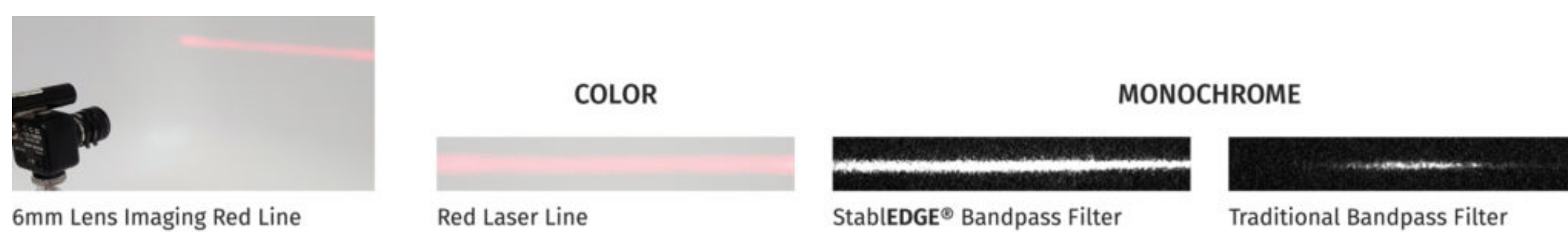
This feature is becoming increasingly important as today's trend in machine vision imaging progresses toward more compact inspection layouts, which utilize less space and force the camera and lens closer to the subject. As a result, short focal length lenses are now more widely used than ever before.

Using a traditional coated interference filter in these more compressed configurations results in contrast loss toward the edges of the image. Because of the angle imposed by the field of view (FOV) of the lens, the passband shifts and allows short wavelength ambient light to overwhelm the subject. Light from LED or laser diode lighting is also cut off. In contrast, peak transmission of StableEDGE® filters is not significantly altered, and effects due to short shifting are minimized.



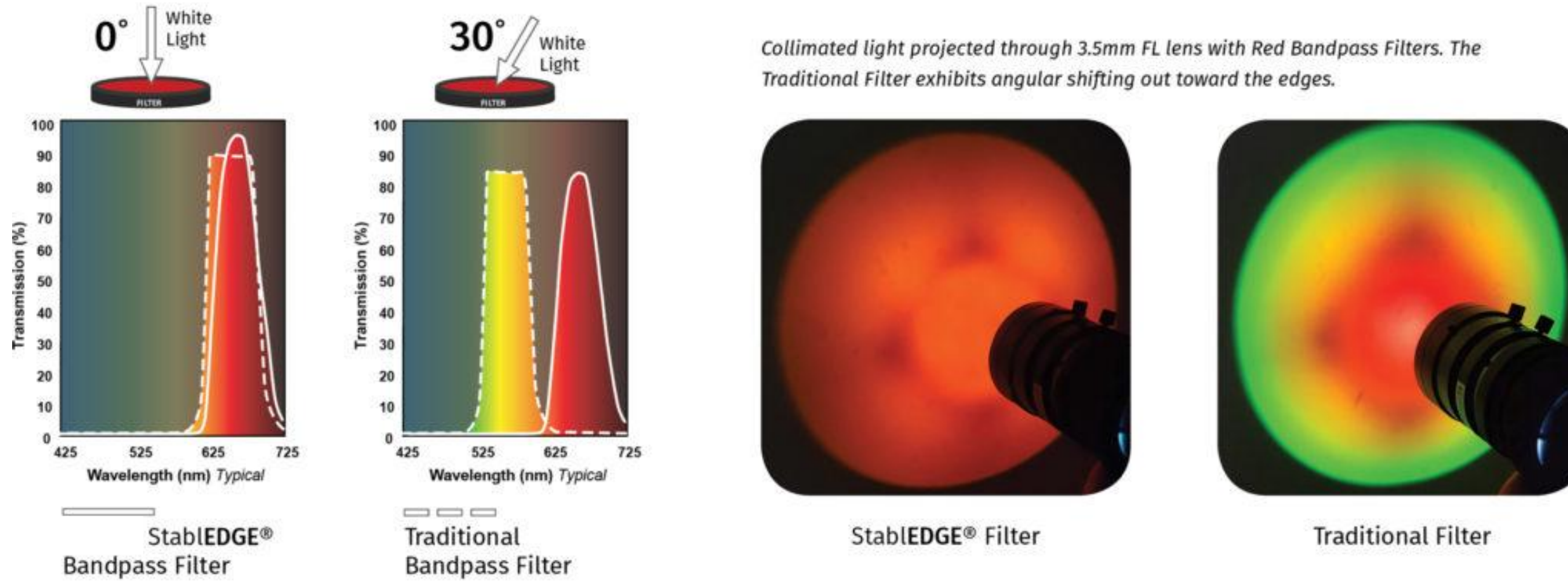
StableEDGE® filters take advantage of absorptive filter glass to form the leading edge of the filter passband. This assures no shifting in this region, even when the lens FOV exceeds 100 degrees. Filter glass also offers superior lower wavelength blocking of ambient light, sharp transition slopes and unmatched durability.

StableEDGE® filter cut-off slopes utilize interference filter coatings; however, the cut-off slope is positioned to be sufficiently broad, and the Gaussian passband profile ensures that excessive ambient light is not allowed to degrade image contrast. Thus, shifting will not significantly encroach into peak transmission, assuring angular insensitivity over the desired range.



Shown above, a monochrome camera with a 6mm focal length lens looks at a red laser diode-generated line in a darkened room. When a StableEDGE® bandpass filter is used, the entire line is visible. When a traditional bandpass filter is used, only the center of the line is visible. The angular field of view (FOV) imposed by the lens causes the outer portion of the filter to "shift short."

In the color photos below, when white light is projected through a lens and traditional filter then imaged with a color camera, only green and orange light are seen at the edges of the projected circle. The StableEDGE® filter exhibits little change, and the projected circle appears red. However, when red laser light is imaged with a monochrome camera, there is no longer any orange or green component to the light. Therefore, with a traditional bandpass filter, the white line simply disappears at the edges.



Traditionally, as the angle degree imposed by the lens' field of view increases, a filter's passband shifts, allowing shorter wavelength light to pass (commonly referred to as blueshifting or short-shifting). In contrast, MidOpt's absorptive filter glass design provides superior lower wavelength blocking, which significantly minimizes the effects of short-shifting.

StableEDGE® designs are less angle-of-incidence sensitive, are inherently more rugged, are environmentally stable, and can be found in the BP and BN (Bandpass) series; AC (Acrylic) series; LA, LB and FL (Light Balancing) series; SP (Shortpass) series; and LP (Longpass) series filters. –

