LP418 UV BLOCK A/R PROTECTIVE WINDOW

MidOpt Protective Filters

MidOpt specializes in manufacturing custom made Protective Windows, which can be designed for nearly any type or size application at any wavelength range requirement. MidOpt custom windows can be manufactured from different substrates and include various coatings depending on the application requirements.

- Glass, acrylic, polycarbonate, sapphire and other substrates
- Oleophobic, anti-reflection, anti-smudge, anti-fog and hydrophobic coatings available
- Chemically strengthened glass options, including Gorilla Glass®
- Wavelength and polarization filtering
- Adhesive backing for easy fastening
- Custom silk screening service for borders, masking, fiducial marks, logos or patterns
- Available with various mounting configurations based on need

Protective Filter Applications

MidOpt Protective Filters are used to protect expensive or fragile optical elements from environmental hazards such as liquids, dust, dirt, and other debris.

LP Series - Protective Filters

- Variety of materials available with different physical properties
- Sapphire option for weld resistance
- Fused Silica option for low thermal expansion and high shock resistance
- Borofloat option for excellent strength, thermal, mechanical and solar properties (similar to that of Pyrex)
- Glass options for low-cost protection where dust covers are required
- Anti-Reflective coated glass offers low cost dust protection with improved optical properties
- UV Absorptive and Blocking Options to protect UV sensitive imagers from damaging Ultra-Violet light
- Germanium option for thermal imaging and LWIR (long-wave infrared)

APPLICATIONS: Protective filters are useful in nearly all imaging and sensing applications where optical protection is necessary from environmental contaminants

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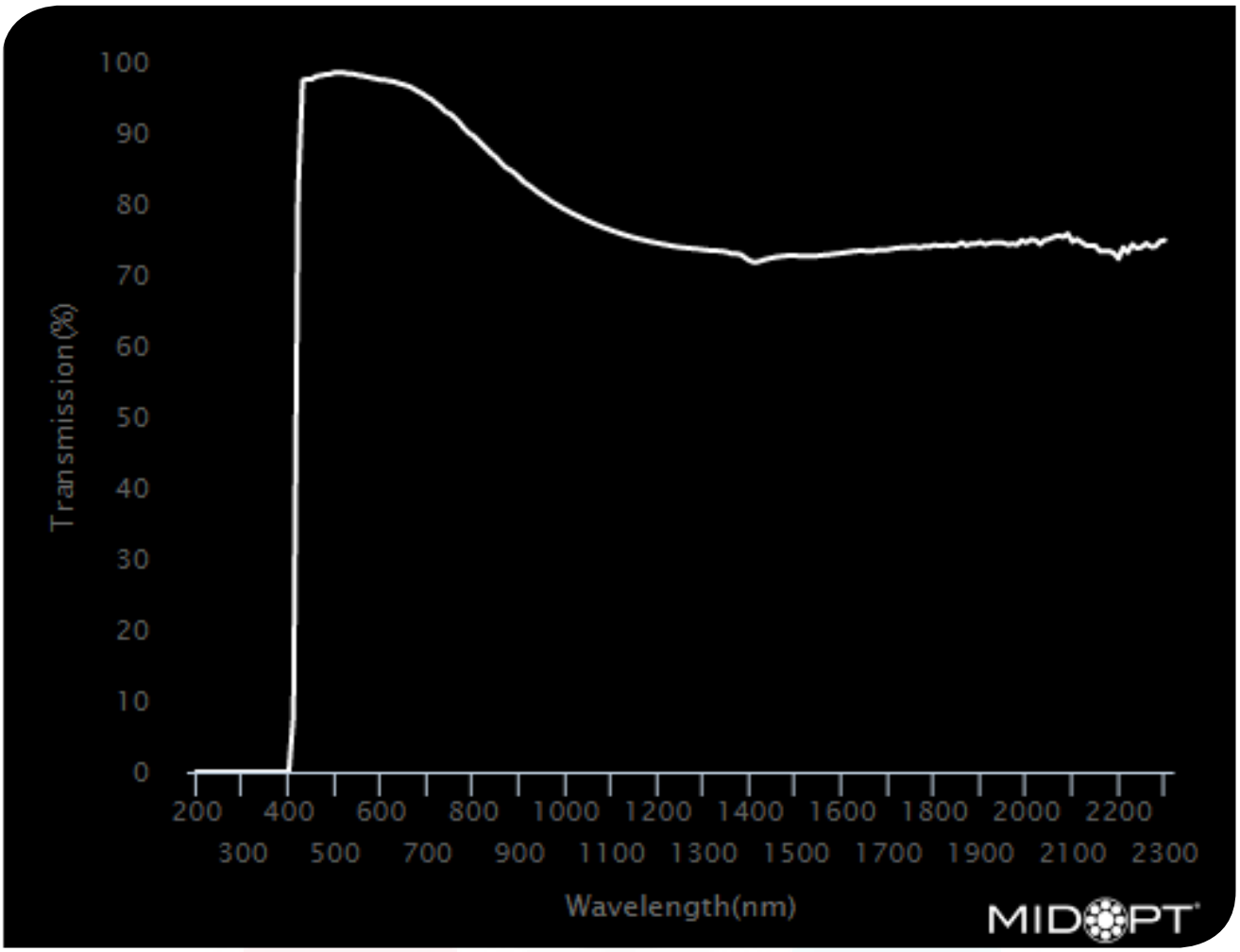
LP418

Protective Filters



Useful Range:	425-1100nm
Cut-on Wavelength 50% T:	418nm
Tolerance:	+/- 10nm
Peak Transmission:	≥90%
Surface Quality:	40/20

LP418 filters are absorptive filters used to block unwanted ultraviolet (UV) light while allowing high (>90%) visible and near-IR light transmission. Camera sensors typically will have some sensitivity in the UV spectrum. This light can at times be recorded by the camera as if it is blue light, resulting in an exaggerated bluish tint. These filters are well suited for color imaging applications as they absorb UV light, are angle insensitive, and are precision ground and polished to exceptional flatness and parallelism. They are also frequently used in UV fluorescence applications to block interference from a UV excitation source, thereby increasing image contrast in the visible range. This material is unique in that it contains almost no phosphorus, and therefore does not autofluoresce when exposed to intense UV light.

MIDOPT
MIDWEST OPTICAL SYSTEM, INC.

LP418 TRANSMISSION DATA (TYPICAL)

Wavelength (nm)	Transmission (%)
200	0.01
210	0.00
220	0.00
230	0.00
240	0.00
250	0.00
260	0.00
270	0.00
280	0.00
290	0.00
300	0.00
310	0.00
320	0.00
330	0.00
340	0.00
350	0.00
360	0.00
370	0.00
380	0.00
390	0.00
400	0.00
410	8.04
420	81.80
430	97.41
440	97.62
450	97.59
460	98.02
470	98.12
480	98.26
490	98.32
500	98.55
510	98.54
520	98.50
530	98.35
540	98.33
550	98.16
560	98.08
570	97.93
580	97.79
590	97.64
600	97.47
610	97.46
620	97.33
630	97.22
640	96.96
650	96.81
660	96.59
670	96.27
680	95.86
690	95.54
700	95.08
710	94.73
720	94.15
730	93.67
740	93.01
750	92.72
760	92.12
770	91.48
780	90.68
790	90.02
800	89.63
810	89.00
820	88.34
830	87.72
840	87.07
850	86.56
860	85.82
870	85.17
880	84.81
890	84.36
900	83.74
910	83.11
920	82.66
930	82.20
940	81.67
950	81.24
960	80.80
970	80.33
980	79.97
990	79.56
1000	79.21
1010	78.86
1020	78.53
1030	78.21
1040	77.88
1050	77.59
1060	77.29
1070	77.03
1080	76.76
1090	76.53
1100	76.29

LP418 TRANSMISSION DATA (TYPICAL)

Wavelength (nm)	Transmission (%)
1110	76.06
1120	75.83
1130	75.62
1140	75.44
1150	75.25
1160	75.08
1170	74.93
1180	74.77
1190	74.63
1200	74.51
1210	74.36
1220	74.25
1230	74.12
1240	74.00
1250	73.91
1260	73.84
1270	73.77
1280	73.71
1290	73.65
1300	73.56
1310	73.49
1320	73.45
1330	73.41
1340	73.36
1350	73.25
1360	73.01
1370	73.01
1380	72.90
1390	72.44
1400	72.01
1410	71.79
1420	71.89
1430	72.13
1440	72.30
1450	72.44
1460	72.57
1470	72.64
1480	72.72
1490	72.72
1500	72.72
1510	72.70
1520	72.66
1530	72.68
1540	72.70
1550	72.72
1560	72.81
1570	72.85
1580	72.95
1590	73.02
1600	73.10
1610	73.19
1620	73.30
1630	73.38
1640	73.44
1650	73.40
1660	73.33
1670	73.39
1680	73.58
1690	73.51
1700	73.57
1710	73.71
1720	73.81
1730	73.86
1740	73.87
1750	73.96
1760	73.94
1770	73.86
1780	74.08
1790	73.99
1800	74.25
1810	74.12
1820	74.12
1830	74.26
1840	74.08
1850	74.22
1860	74.60
1870	74.16
1880	74.42
1890	74.38
1900	74.65
1910	74.29
1920	74.47
1930	74.61
1940	74.54
1950	74.53
1960	74.29
1970	74.40
1980	74.27
1990	74.90
2000	74.58
2010	75.01

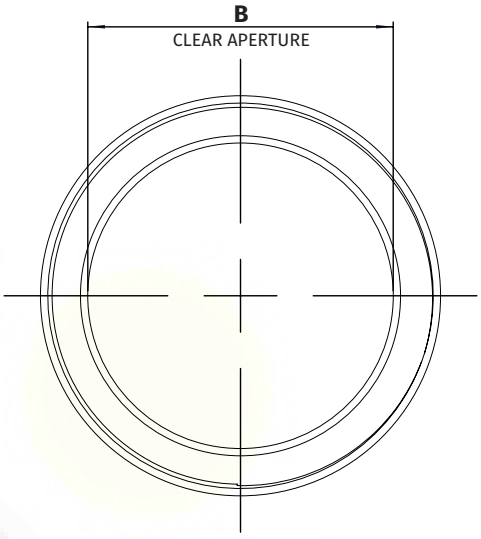
LP418 TRANSMISSION DATA (TYPICAL)

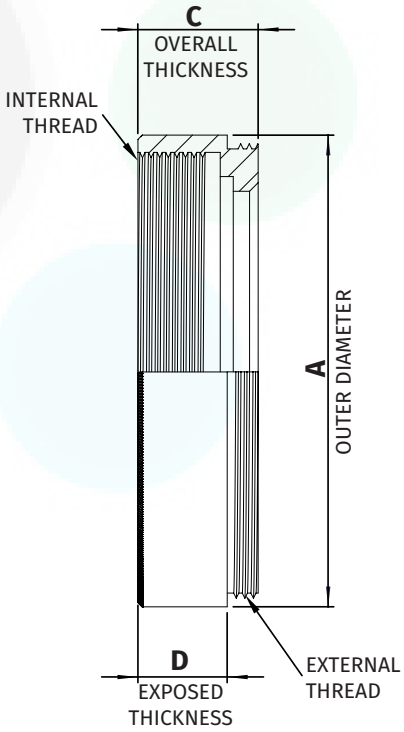
Wavelength (nm)	Transmission (%)
2020	74.89
2030	74.35
2040	74.95
2050	75.07
2060	75.38
2070	75.55
2080	75.36
2090	75.81
2100	74.68
2110	75.05
2120	74.59
2130	74.17
2140	74.14
2150	74.10
2160	73.32
2170	73.40
2180	73.38
2190	73.06
2200	72.32
2210	73.88
2220	73.22
2230	74.31
2240	73.77
2250	73.93
2260	74.45
2270	74.00
2280	74.01
2290	74.75
2300	74.90

STANDARD THREADED MOUNT DIMENSIONS

NOTES:

1. Inner and outer threads are of the same size and pitch.
2. Filter mount and retaining ring are black anodized aluminum.
3. All dimensions indicated in mm.
4. Tolerance: +/-0.3mm.

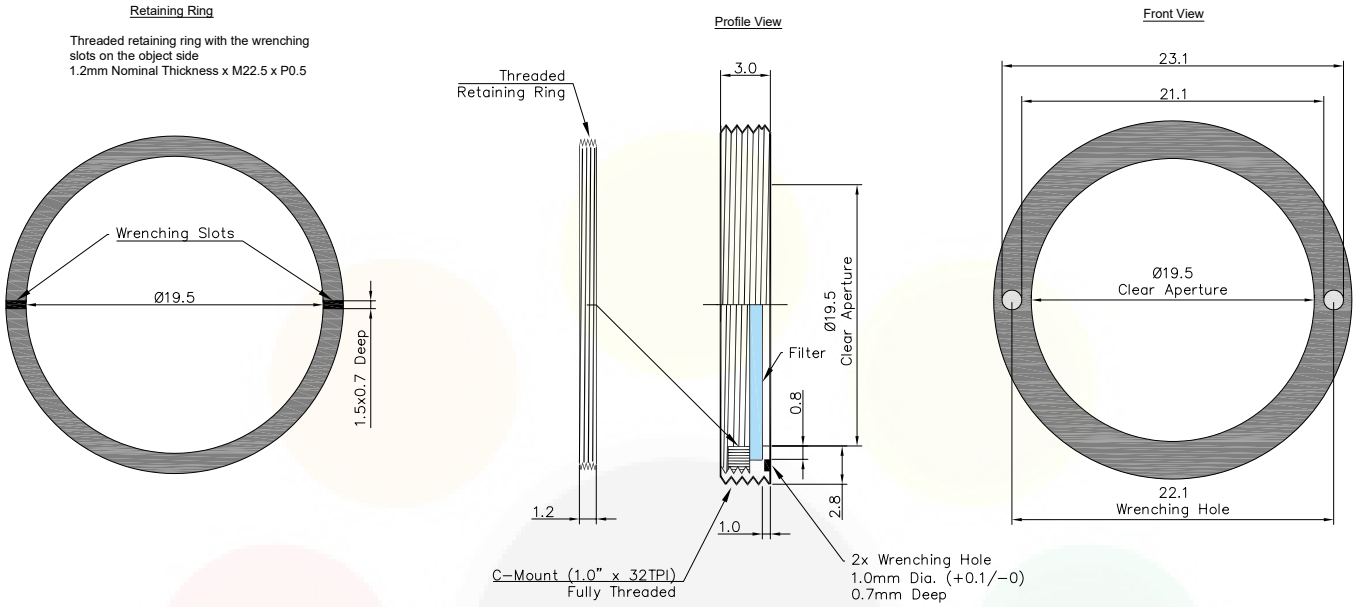




Mount Size	A	B	C	D
M13.25 x P0.5	14.3	10.6	7.5	5.7
M22.5 x P0.5	24	18.5	7	5.2
M25.5 x P0.5	27.5	21	7	5.2
M27 x P0.5	29	22.5	7	5.2
M30.5 x P0.5	32.5	25.5	7	5.2
M34 x P0.5	36	29	7	5.2
M35.5 x P0.5	37.5	30.5	7	5.2
M37 x P0.75	39	31.9	6.5	4.5
M37.5 x P0.5	39.5	32.5	7.2	5.2
M39 x P0.5	41	34	7	5.2
M40.5 x P0.5	42.5	35.5	7	5.2
M43 x P0.75	45	38	7	5.2
M46 x P0.75	48	41	7	5.2
M48 x P0.75	50	43	7	5.1
M49 x P0.75	51	44	7	5.2
M52 x P0.75	54	47	7	5.2
M55 x P0.75	57	50	7	5.2
M58 x P0.75	60	52.9	6.5	4.5
M62 x P0.75	64	57.1	7	5.2
M67 x P0.75	70	61.8	6.5	4.5
M72 x P0.75	75	66.9	6.5	4.5
M77 x P0.75	80	71.9	6.5	4.5
M82 x P0.75	85	76.8	6.5	4.5
M86 x P1.0	89	80.8	6.5	4.5
M95 x P1.0	98.2	89.9	10	7.1
M105 x P1.0	109.8	100	11	8

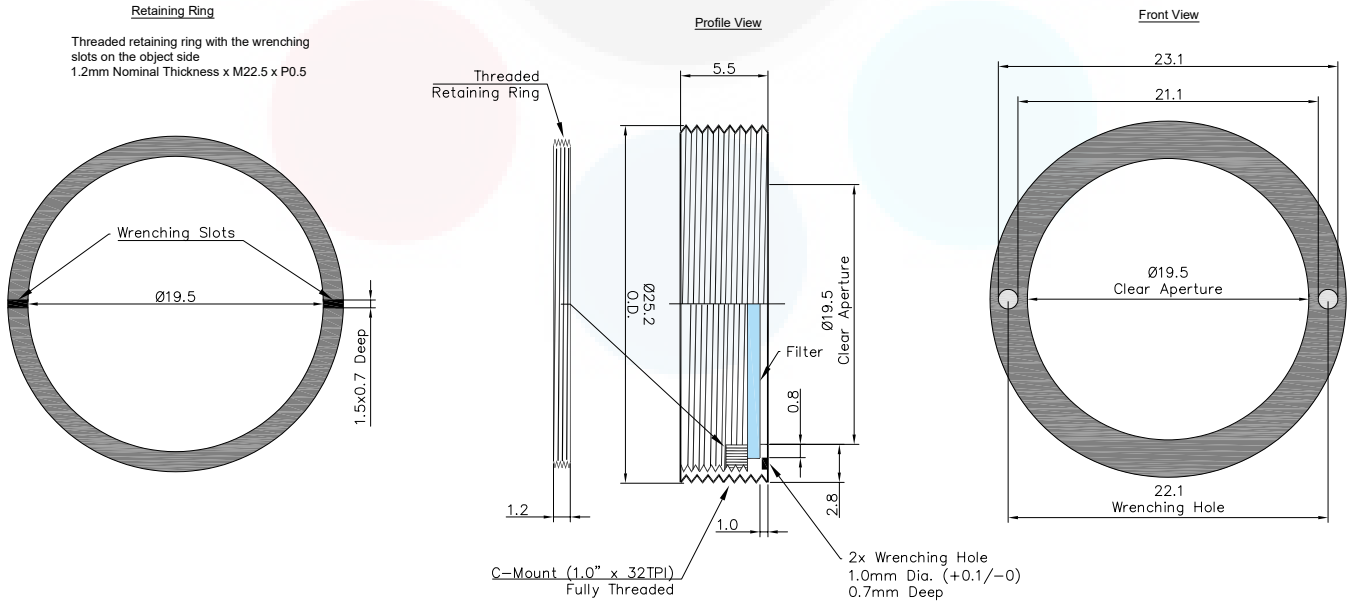
C-MOUNT DIMENSIONS (-25.4)

C-Mount is available on filters with a substrate thickness of 1mm or less



C-MOUNT SIS DIMENSIONS (-25.4-SIS)

C-Mount SIS is available on filters with a substrate thickness greater than 1mm and less than or equal to 3.5mm



MOUNTS FOR ANY SYSTEM

Midwest Optical Systems is the world's leading resource in machine vision filters and optical solutions. MidOpt's innovative filter designs ensure flawless control, dependable results and unmatched image quality. Mounting solutions are available for any system for lenses with and without filter threads, the exclusively designed 25.4™ C-Mount, and custom fabrication of unmounted shapes and sizes.

› THREADED MOUNT *Designed for Lenses with Filter Threads*

- MidOpt offers the largest variety of filters in-stock and ready to ship
- Sizes available: M13.25-M105
- Black anodized aluminum
- Custom thread sizes are available upon request

CREATE PART #: *Select a filter and add a mount size (e.g. M27) Example: BP470-27*

› 25.4™ C-MOUNT *Threads into all C-Mount Cameras*

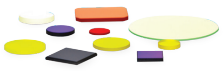
- 25.4™ C-Mount Camera Filter exclusively designed by MidOpt to thread directly into any C-Mount Camera between the lens and sensor
- Recommended for use with wide angle lenses to prevent vignetting and angle shift
- Helpful in applications with space constraints and lenses without filter threads
- Custom installation wrench included

CREATE PART #: *Select a filter and add "-25.4" Example: BP470-25.4*

› SLIP MOUNT *Designed for Wide Angle Lenses Without Filter Threads*

- Accommodates standard threaded mounts
- Low profile and oversize diameter design prevents wide angle lens vignetting
- Includes black Delrin® Slip Mount adapter plus Threaded Mount Filter

CREATE PART #: *Select a filter, use "S" for slip and add the outside diameter of lens in mm (e.g. 43mm) Example: BP470-S43*



› UNMOUNTED

- Any MidOpt filter type can be provided as an Unmounted Filter
- Custom shapes and sizes are typically available within a two week lead time with many shipped same day

CREATE PART #
CIRCLE: *Use "D" and add diameter in mm (e.g. 19mm) Example: BP470-D19*
SQUARE: *Use "R" and add side measurement in mm (e.g. 15mm) Example: BP470-R15*
RECTANGLE: *Use "R" and add length in mm (e.g. 30mm) x width in mm (e.g. 15mm) Example: BP470-R30x15*

› CUSTOM SOLUTIONS FOR M12 MOUNT LENSES

- Offered in aluminum slip mount over the lens
- Can be optically cemented behind the lens

Mount Sizes

› THREADED

Mount Size	Pitch
M13.25	0.5
M22.5	0.5
M25.5	0.5
M27	0.5
M30.5	0.5
M34	0.5
M35.5	0.5
M37	0.75
M37.5	0.5
M39	0.5
M40.5	0.5
M43	0.75
M46	0.75
M48	0.75
M49	0.75
M52	0.75
M55	0.75
M58	0.75
M62	0.75
M67	0.75
M72	0.75
M77	0.75
M82	0.75
M86	1.0
M95	1.0
M105	1.0

› C-MOUNT
M25.4™

› SLIP MOUNT

Outside Diameter Range	Threaded Mount
15.1-19.0	M22.5
19.1-26.5	M30.5
26.6-31.9	M40.5
32.0-40.9	M46
41.0-50.9	M55
51.0-57.9	M62
58.0-68.0	M72
68.1-79.0	M82
79.1-101.0	M105

› UNMOUNTED
Custom Shapes & Sizes Available

› M12 MOUNT

Outside Diameter Range	Part #
13.2-14.2	S14A
14.3-15.0	S15A

HOW TO ORDER

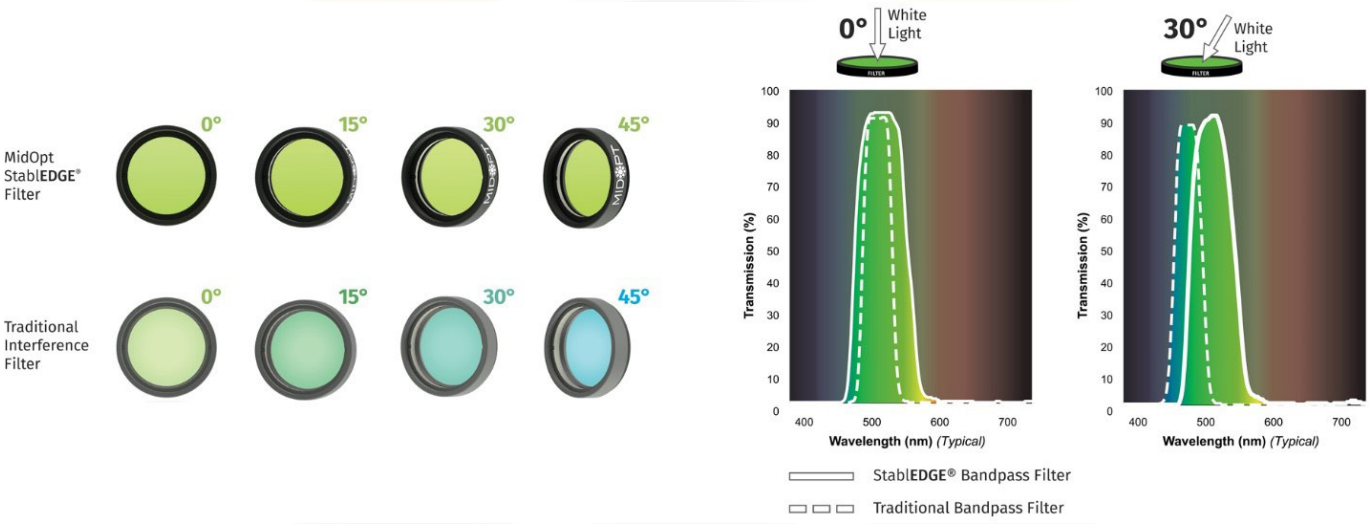
To order a filter with a threaded mount, first select a filter (e.g. BP470) and add the mount size (e.g. M27) to build your part number (e.g. BP470-27).

MIDOPT STABLEDGE®

Minimize the Effects of Short Shifting

MidOpt StablEDGE® 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 towards more compact inspection layouts, which utilize less space – forcing 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 MidOpt's StablEDGE® filters is not significantly altered, and effects due to short shifting are minimized.



StablEDGE® 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°. Filter glasses also offer far superior lower wavelength blocking of ambient light, sharp transition slopes and unmatched durability. MidOpt's StablEDGE® 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.

Among all machine vision filter manufacturers, MidOpt is unique in incorporating StablEDGE® technology across a full range of products. StablEDGE® designs are less angle-of-incidence sensitive, inherently more rugged, and are environmentally stable.