# LP1070 SHORT-WAVE INFRARED LONGPASS FILTER

## MidOpt Longpass (Sharp-Cut) Filters

- Available in VIS, NIR (Near-Infrared), and SWIR (Short-Wave Infrared) passbands
- Achieve optimal contrast
- Improve system control, repeatability and stability
- Block interfering wavelengths, eliminating the need for shrouds
- Increase resolution by reducing chromatic aberration
- Anti-reflection coated for maximum transmission
- Hard coated, single substrate fabrication
- Exceptional surface quality; 40/20 scratch/dig


## Longpass Filter Applications

Often referred to as a "sharp-cut" filter, Longpass Filters are specifically designed to pass a broad spectrum of longer wavelength light while blocking shorter wavelengths.

## LP Series – Longpass Filters

- Economical solution for isolating specific spectral regions
- Peak transmission ≥90%
- StablEDGE® design reduces angular dependency and minimizes short-shifting effects
- Anti-reflection coated for maximum transmission in VIS and NIR spectrums
- Can be used with Shortpass Filters for a custom, fine-tuned Bandpass Filter
- Double-side polished glass for exceptional parallelism and optical flatness
- Exceptional surface quality; 40/20 scratch/dig
- Available in wavelength ranges from 350nm to 1850nm

**APPLICATIONS:** Longpass Filters are often used in fluorescence applications to block an excitation light source or to pass multiple emission wavelengths, improving signal to noise ratio. Longpass Filters are also commonly used in photography and astronomy.

MIDOPT
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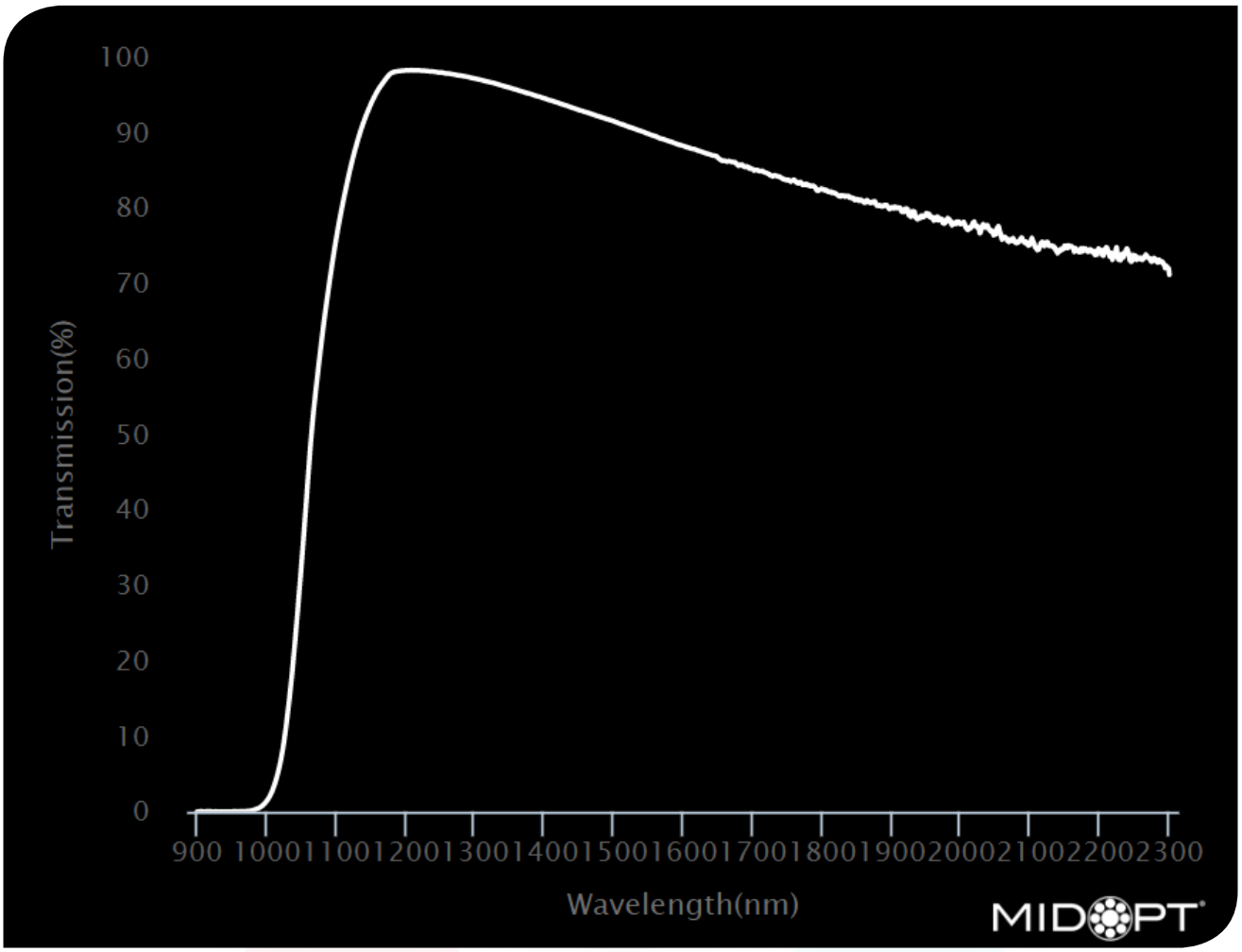
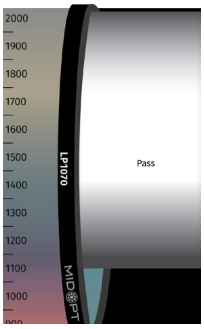
# LP1070

Longpass Filter




| | |
|---|---|
| **Useful Range:** | 1100-2300nm |
| **Cut-on Wavelength 50% T:** | 1070nm |
| **Tolerance:** | +/- 10nm |
| **Peak Transmission:** | ≥90% |
| **Surface Quality:** | 40/20 |
| **STABLEDGE:** | Yes |




LP1070 is a 0.7mm thick silicon Longpass filter with antireflection coatings on both sides optimized for 1100-2300nm transmission. Because silicon is inherently opaque, blocking in the visible and very near-IR spectrums is excellent, and the positioning of the cut-on slope is completely insensitive to the angle of incidence of light impinging on the surfaces. LP1070 also reduces Nd:YAG (1064nm) light transmission by approximately 50%. This filter is mainly intended for use with SWIR camera systems and blocks essentially all light that CCD/CMOS cameras might normally be sensitive to.

MIDWEST OPTICAL SYSTEM, INC.



MachineVisionDirect.com support@machinevisiondirect.com 1 (800) 834-5588

## LP1070 TRANSMISSION DATA (TYPICAL)

| Wavelength (nm) | Transmission (%) |
|---|---|
| 2300 | 71.19 |
| 2290 | 72.89 |
| 2280 | 73.13 |
| 2270 | 73.43 |
| 2260 | 73.19 |
| 2250 | 73.67 |
| 2240 | 74.40 |
| 2230 | 73.14 |
| 2220 | 73.57 |
| 2210 | 74.80 |
| 2200 | 74.36 |
| 2190 | 74.26 |
| 2180 | 74.61 |
| 2170 | 74.18 |
| 2160 | 74.79 |
| 2150 | 74.69 |
| 2140 | 74.42 |
| 2130 | 75.01 |
| 2120 | 74.98 |
| 2110 | 74.45 |
| 2100 | 75.41 |
| 2090 | 75.62 |
| 2080 | 75.38 |
| 2070 | 75.74 |
| 2060 | 76.06 |
| 2050 | 76.54 |
| 2040 | 77.25 |
| 2030 | 77.58 |
| 2020 | 77.77 |
| 2010 | 77.13 |
| 2000 | 77.91 |

| Wavelength (nm) | Transmission (%) |
|---|---|
| 1990 | 77.91 |
| 1980 | 78.42 |
| 1970 | 78.57 |
| 1960 | 78.62 |
| 1950 | 79.34 |
| 1940 | 78.69 |
| 1930 | 79.59 |
| 1920 | 79.94 |
| 1910 | 80.05 |
| 1900 | 80.12 |
| 1890 | 80.43 |
| 1880 | 80.37 |
| 1870 | 80.77 |
| 1860 | 80.80 |
| 1850 | 81.21 |
| 1840 | 81.38 |
| 1830 | 81.68 |
| 1820 | 81.91 |
| 1810 | 82.16 |
| 1800 | 82.54 |
| 1790 | 82.74 |
| 1780 | 83.12 |
| 1770 | 83.35 |
| 1760 | 83.76 |
| 1750 | 83.75 |
| 1740 | 84.08 |
| 1730 | 84.29 |
| 1720 | 84.69 |
| 1710 | 84.92 |
| 1700 | 85.18 |
| 1690 | 85.53 |

| Wavelength (nm) | Transmission (%) |
|---|---|
| 1680 | 85.62 |
| 1670 | 86.13 |
| 1660 | 86.27 |
| 1650 | 86.70 |
| 1640 | 87.07 |
| 1630 | 87.37 |
| 1620 | 87.68 |
| 1610 | 87.96 |
| 1600 | 88.27 |
| 1590 | 88.54 |
| 1580 | 88.87 |
| 1570 | 89.19 |
| 1560 | 89.54 |
| 1550 | 89.85 |
| 1540 | 90.21 |
| 1530 | 90.53 |
| 1520 | 90.85 |
| 1510 | 91.17 |
| 1500 | 91.54 |
| 1490 | 91.82 |
| 1480 | 92.13 |
| 1470 | 92.43 |
| 1460 | 92.75 |
| 1450 | 93.01 |
| 1440 | 93.34 |
| 1430 | 93.66 |
| 1420 | 93.98 |
| 1410 | 94.28 |
| 1400 | 94.57 |

## LP1070 TRANSMISSION DATA (TYPICAL)

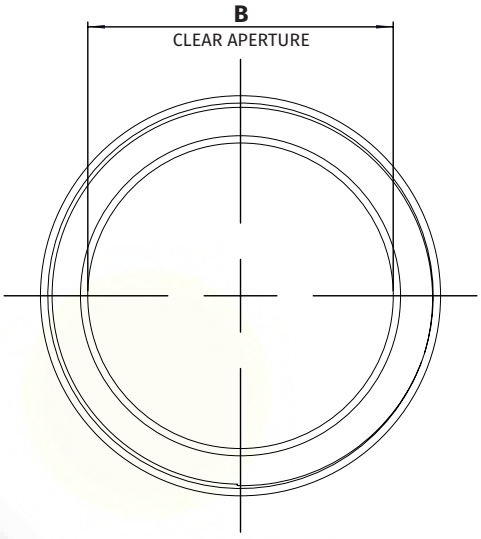
| Wavelength (nm) | Transmission (%) |
|---|---|
| 1390 | 94.85 |
| 1380 | 95.16 |
| 1370 | 95.42 |
| 1360 | 95.71 |
| 1350 | 95.99 |
| 1340 | 96.24 |
| 1330 | 96.53 |
| 1320 | 96.75 |
| 1310 | 96.99 |
| 1300 | 97.19 |
| 1290 | 97.41 |
| 1280 | 97.57 |
| 1270 | 97.74 |
| 1260 | 97.85 |
| 1250 | 98.00 |
| 1240 | 98.12 |
| 1230 | 98.20 |
| 1220 | 98.26 |
| 1210 | 98.29 |
| 1200 | 98.26 |
| 1190 | 98.17 |
| 1180 | 97.92 |
| 1170 | 96.90 |
| 1160 | 95.56 |
| 1150 | 93.73 |
| 1140 | 91.42 |
| 1130 | 88.53 |
| 1120 | 84.95 |
| 1110 | 80.67 |
| 1100 | 75.70 |
| 1090 | 69.71 |

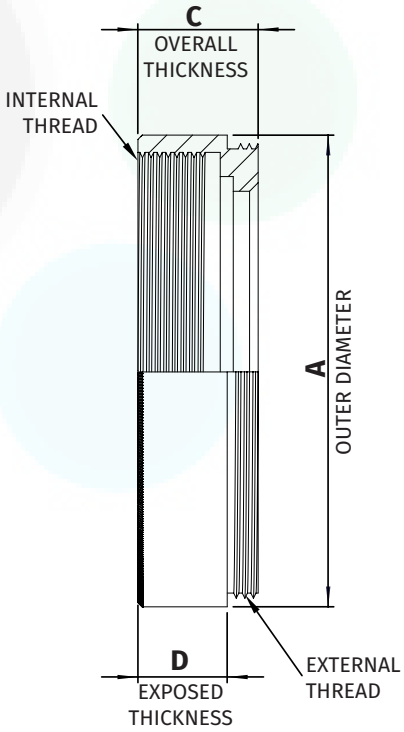
| Wavelength (nm) | Transmission (%) |
|---|---|
| 1080 | 62.83 |
| 1070 | 54.92 |
| 1060 | 44.39 |
| 1050 | 32.24 |
| 1040 | 21.35 |
| 1030 | 12.58 |
| 1020 | 6.52 |
| 1010 | 3.15 |
| 1000 | 1.37 |
| 990 | 0.53 |
| 980 | 0.19 |
| 970 | 0.06 |
| 960 | 0.02 |
| 950 | 0.01 |
| 940 | 0.00 |
| 930 | 0.00 |
| 920 | 0.04 |
| 910 | 0.01 |
| 900 | 0.00 |

## 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.

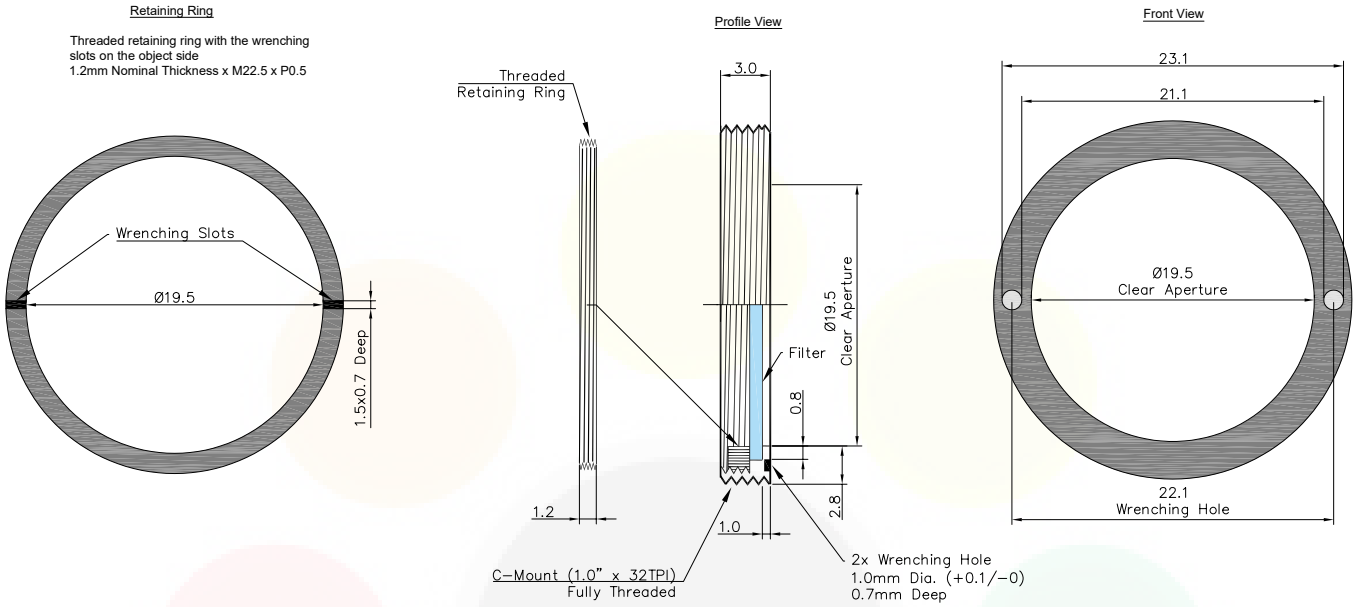



| Mount Size | A | B | C | D |
|---|---|---|---|---|
| M13.25 x P0.5 | 14.3 | 10.6 | 7.5 | 5.7 |
| M22.5 x P0.5 | 24 | 18.5 | 7 | 5.2 |
| M25.5 x P0.5 | 27.5 | 21 | 7 | 5.2 |
| M27 x P0.5 | 29 | 22.5 | 7 | 5.2 |
| M30.5 x P0.5 | 32.5 | 25.5 | 7 | 5.2 |
| M34 x P0.5 | 36 | 29 | 7 | 5.2 |
| M35.5 x P0.5 | 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 |

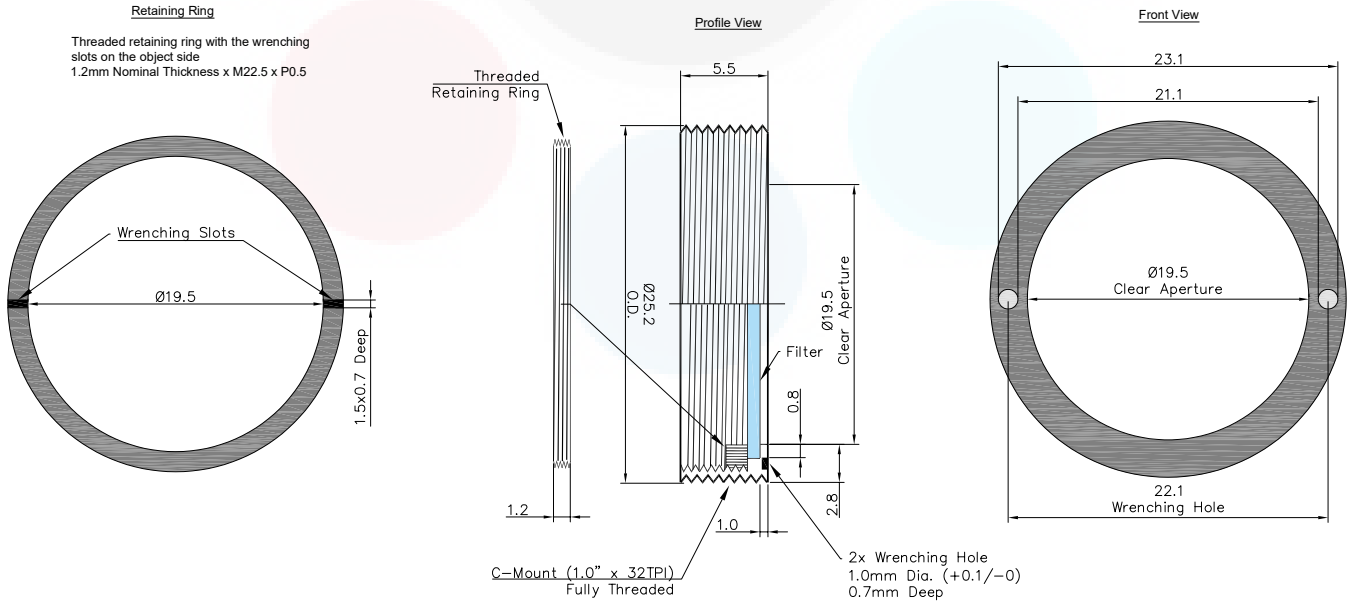
## C-MOUNT DIMENSIONS (-25.4)

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

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MIDWEST OPTICAL SYSTEM, INC.

# 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*

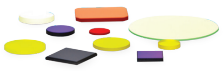
- 25.4™ C-Mount Camera Filter exclusively designed by MidOpt to thread directly into any C-Mount Camera between the lens and sensor
- Recommended for use with wide angle lenses to prevent vignetting and angle shift
- Helpful in applications with space constraints and lenses without filter threads
- Custom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

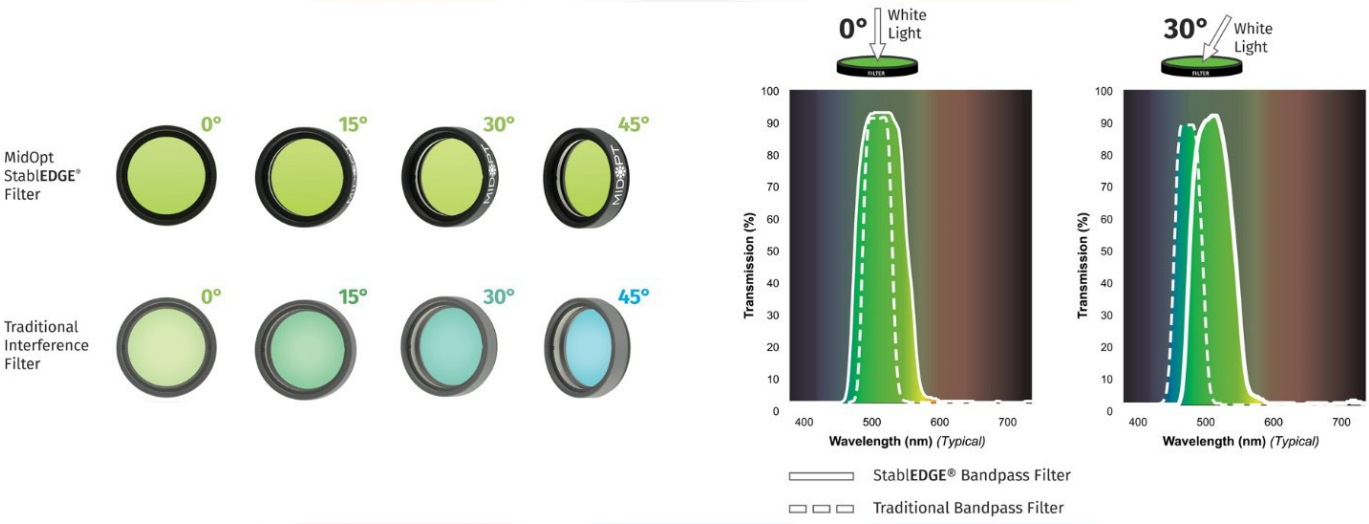
To order a filter with a threaded mount, first select a filter (e.g. BP470) and add the mount size (e.g. M27) to build your part number (e.g. BP470-27).

# 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.