

LP390 UV-ABSORBING 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.

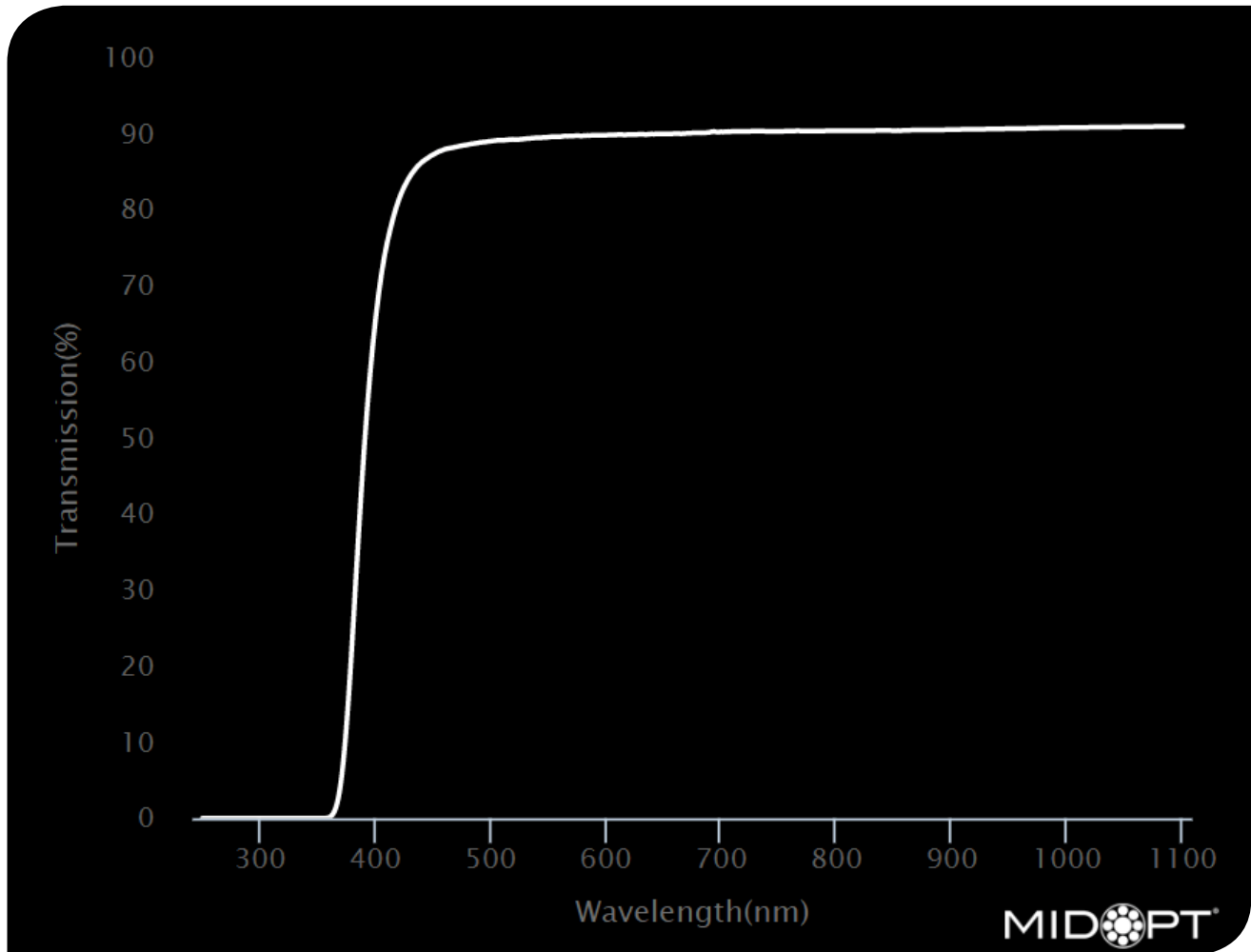
LP Series - Protective Filters

- 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

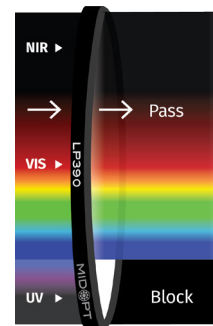
LP390

Protective Filters



Useful Range:	410-1100nm
Cut-on Wavelength 50% T:	380nm
Tolerance:	+/- 10nm
Peak Transmission:	≥90%
Surface Quality:	40/20
STABLEEDGE:	Yes

LP390 filters are absorptive filters used to block ultraviolet (UV) light while allowing high (>90%) visible and near-IR light transmission. Most silicon camera sensors have some sensitivity in the UV spectrum. In some color cameras this light can typically be recorded 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 and are precision ground and polished to exceptional flatness and parallelism. They are also frequently used as simple protective windows, shielding expensive camera lenses from inevitable contamination and scratching over time or, in more challenging environments, even breakage.



LP390 TRANSMISSION DATA (TYPICAL)

Wavelength (nm)	Transmission (%)
1100	90.98
1090	90.98
1080	90.96
1070	90.92
1060	90.91
1050	90.91
1040	90.87
1030	90.87
1020	90.86
1010	90.83
1000	90.83
990	90.80
980	90.77
970	90.74
960	90.71
950	90.68
940	90.65
930	90.63
920	90.61
910	90.58
900	90.54
890	90.52
880	90.50
870	90.51
860	90.47
850	90.43
840	90.46
830	90.41
820	90.42
810	90.41
800	90.43

Wavelength (nm)	Transmission (%)
790	90.39
780	90.37
770	90.39
760	90.39
750	90.33
740	90.33
730	90.36
720	90.32
710	90.31
700	90.28
690	90.19
680	90.12
670	90.07
660	90.05
650	90.01
640	89.98
630	89.97
620	89.90
610	89.89
600	89.83
590	89.80
580	89.74
570	89.70
560	89.62
550	89.57
540	89.47
530	89.35
520	89.26
510	89.17
500	89.03
490	88.85

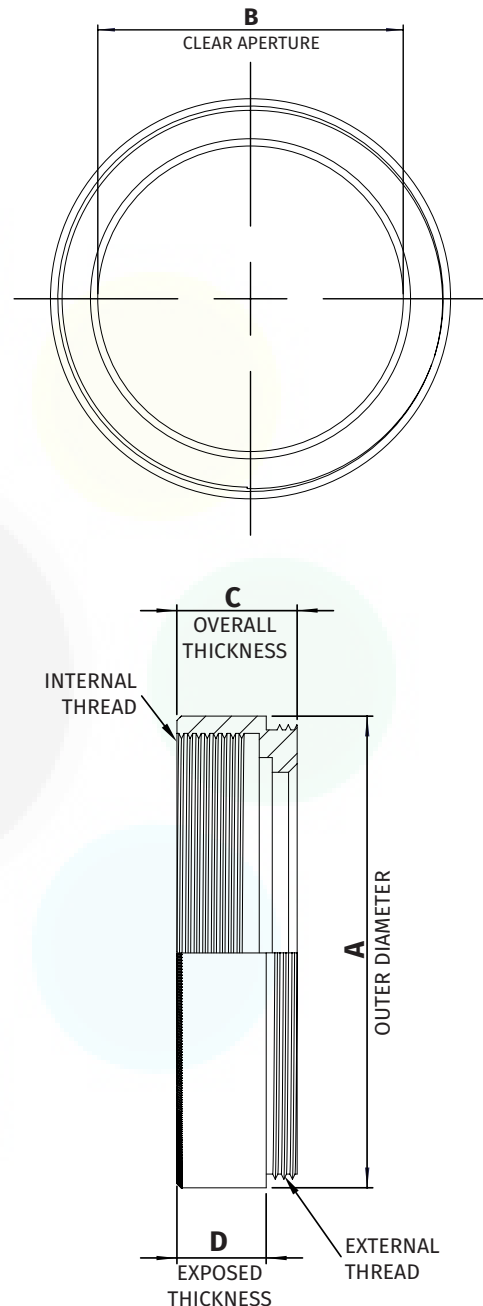
Wavelength (nm)	Transmission (%)
480	88.57
470	88.28
460	87.96
450	87.25
440	86.23
430	84.39
420	81.17
410	75.49
400	65.33
390	47.88
380	23.41
370	4.57
360	0.11
350	0.00
340	0.00
330	0.00
320	0.00
310	0.00
300	0.00
290	0.00
280	0.00
270	0.00
260	0.00
250	0.00

STANDARD THREADED MOUNT DIMENSIONS

NOTES:

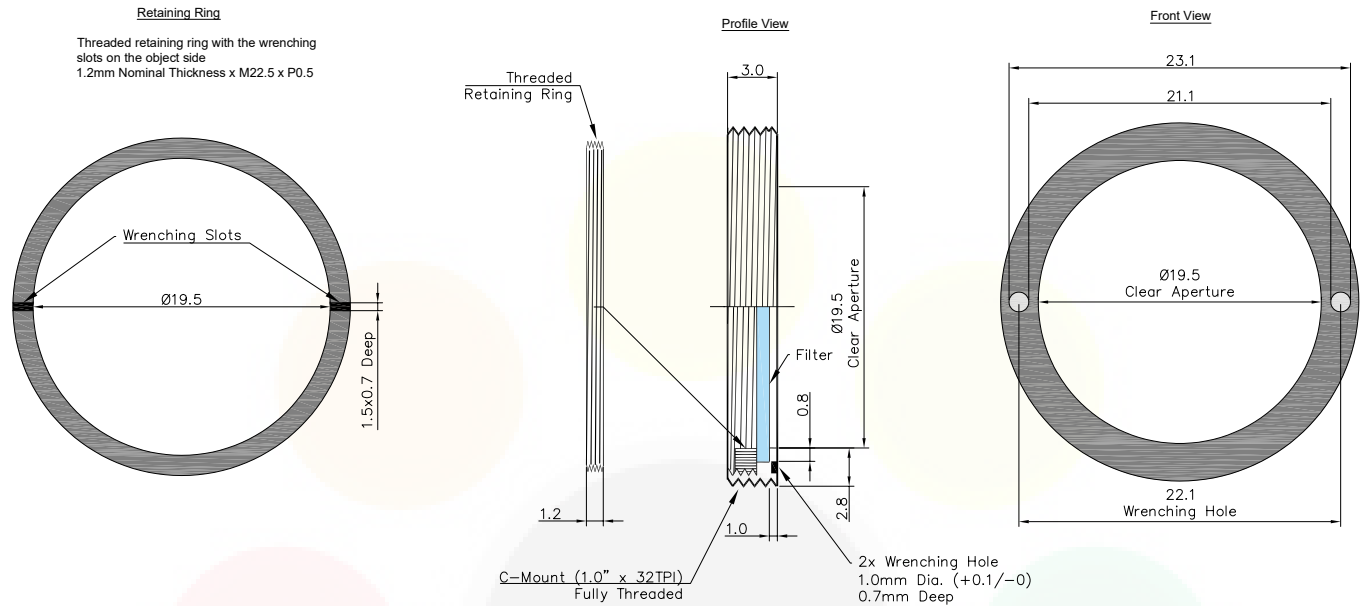
1. Inner and outer threads are of the same size and pitch.
2. Filter mount and retaining ring are black anodized aluminum.
3. All dimensions indicated in mm.
4. Tolerance: +/-0.3mm.

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



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.

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



› **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



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).

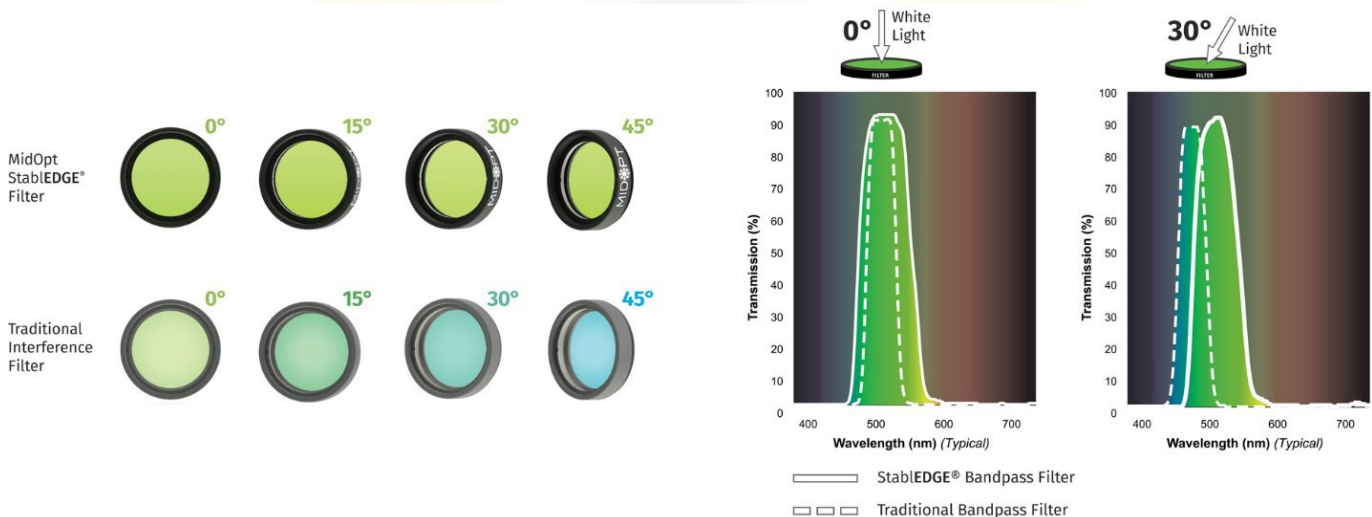


MIDOPT STABLEEDGE®

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.

