Machine VISION DIRECT

LP347 PRECISION MULTI-LAYER VIS A/R COATED GLASS 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.

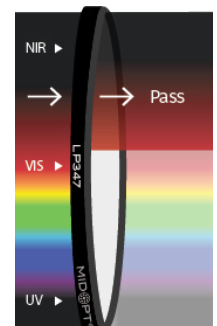### LP Series - Protective Filters

- 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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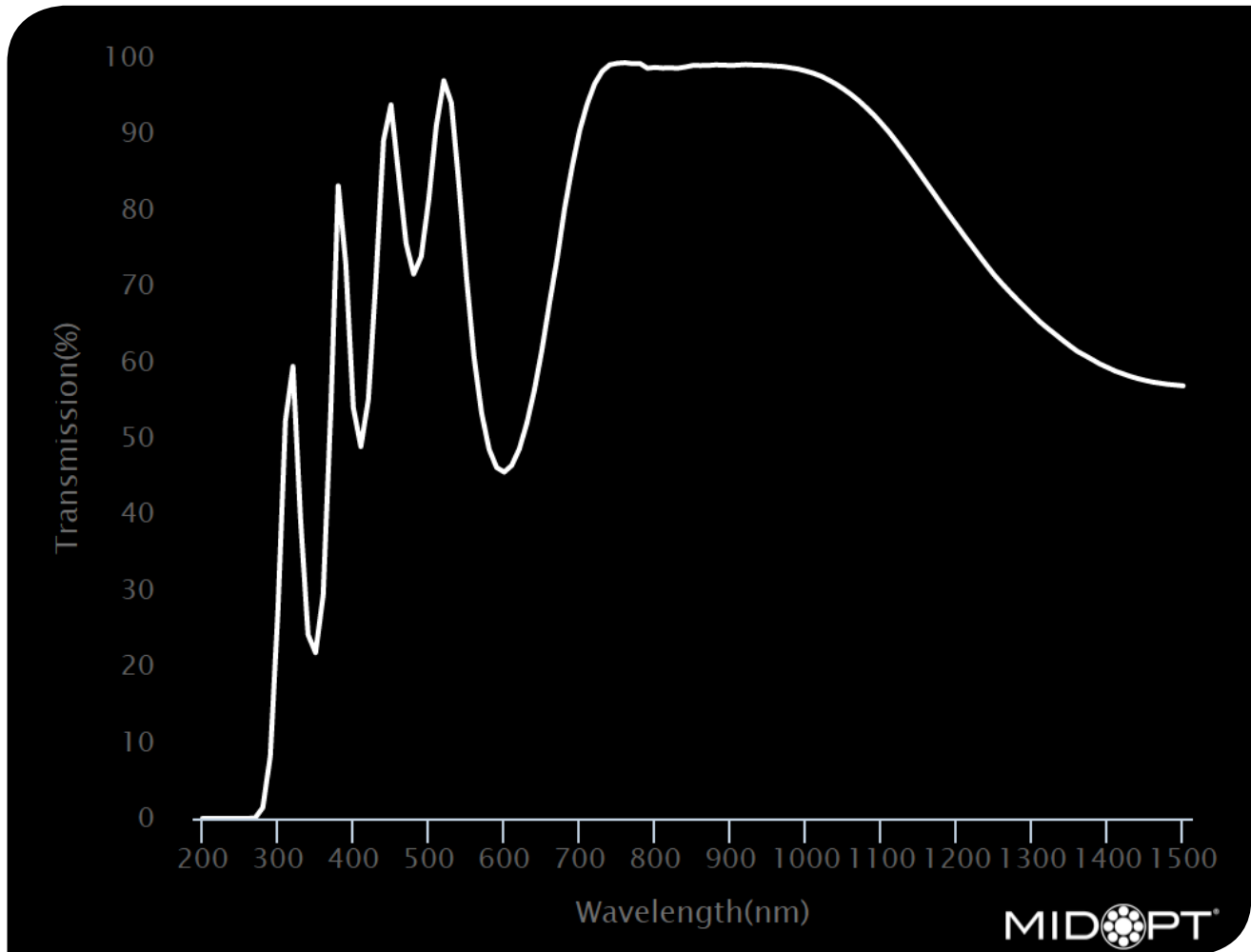
Useful Range:	690-1090nm
Cut-on Wavelength 50% T:	360nm
Tolerance:	+/- 15nm
Peak Transmission:	≥99%
Surface Quality:	40/20
STABLEDGE:	Yes

LP347 Near-IR Windows are anti-reflection-coated windows that are specifically optimized for near-infrared transmission, while still allowing visible light to pass. These windows are made of optically ground, polished and coated B270 crown glass, and are commonly used as protective cover glasses for cameras used in surveillance, LPR/ANPR and security applications that function primarily in the dark with help from infrared light sources.

LP347 TRANSMISSION DATA (TYPICAL)

Wavelength (nm)	Transmission (%)	Wavelength (nm)	Transmission (%)	Wavelength (nm)	Transmission (%)
1500	56.86	1190	79.29	880	99.05
1490	56.96	1180	80.67	870	98.97
1480	57.05	1170	82.09	860	98.96
1470	57.20	1160	83.49	850	98.97
1460	57.35	1150	84.90	840	98.77
1450	57.56	1140	86.30	830	98.61
1440	57.81	1130	87.64	820	98.66
1430	58.10	1120	88.96	810	98.63
1420	58.45	1110	90.23	800	98.72
1410	58.80	1100	91.37	790	98.61
1400	59.27	1090	92.47	780	99.23
1390	59.72	1080	93.43	770	99.21
1380	60.29	1070	94.34	760	99.34
1370	60.85	1060	95.15	750	99.26
1360	61.38	1050	95.87	740	99.06
1350	62.12	1040	96.52	730	98.22
1340	62.88	1030	97.07	720	96.57
1330	63.68	1020	97.57	710	93.90
1320	64.46	1010	97.94	700	90.39
1310	65.29	1000	98.24	690	85.59
1300	66.25	990	98.50	680	80.09
1290	67.22	980	98.66	670	73.45
1280	68.20	970	98.83	660	67.68
1270	69.22	960	98.89	650	61.56
1260	70.28	950	98.97	640	56.26
1250	71.39	940	99.01	630	51.92
1240	72.64	930	99.04	620	48.54
1230	73.93	920	99.09	610	46.40
1220	75.26	910	99.02	600	45.52
1210	76.57	900	98.97		
1200	77.93	890	99.03		

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LP347 TRANSMISSION DATA (TYPICAL)

Wavelength (nm)	Transmission (%)
590	46.12
580	48.53
570	53.31
560	60.67
550	71.14
540	83.37
530	94.05
520	96.98
510	91.03
500	81.32
490	73.85
480	71.55
470	75.57
460	84.66
450	93.80
440	89.09
430	70.87
420	55.09
410	48.87
400	54.01
390	72.94
380	83.15
370	53.24
360	29.31
350	21.78
340	24.15
330	39.42
320	59.42
310	52.24
300	27.16
290	8.19

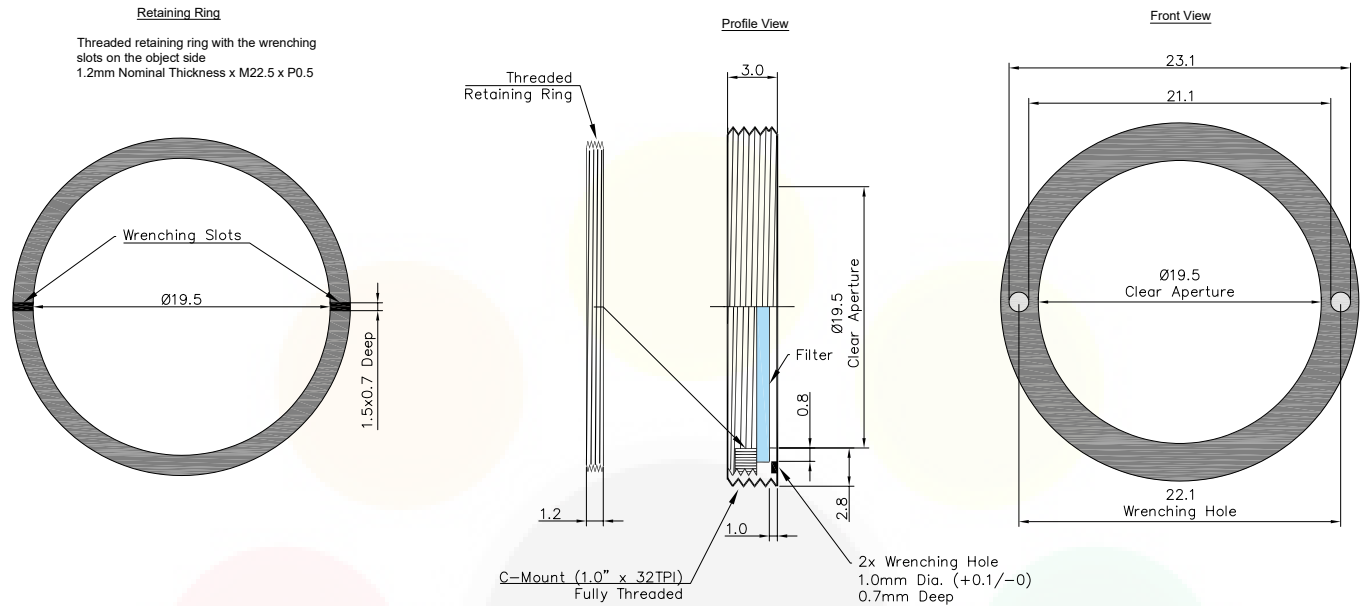| Wavelength (nm)	Transmission (%)
280	1.41
270	0.07
260	0.00
250	0.00
240	0.00
230	0.00
220	0.01
210	0.01
200	0.00

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

B
CLEAR APERTURE

C
OVERALL THICKNESS

INTERNAL THREAD

A
OUTER DIAMETER

D
EXPOSED THICKNESS

EXTERNAL THREAD

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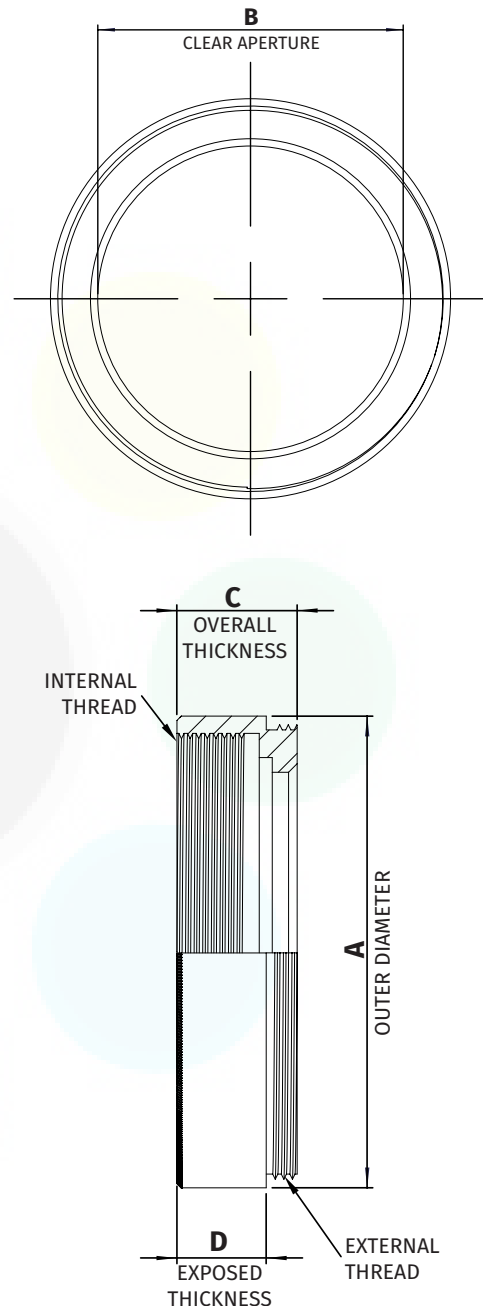
C-MOUNT DIMENSIONS (-25.4)

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

Retaining Ring

Threaded retaining ring with the wrenching slots on the object side
1.2mm Nominal Thickness x M22.5 x P0.5

Wrenching Slots

Ø19.5

1.5x0.7 Deep

Profile View

Threaded Retaining Ring

3.0

Filter

Ø19.5 Clear Aperture

0.8

1.2

1.0

2.8

C-Mount (1.0" x 32TPI) Fully Threaded

2x Wrenching Hole
1.0mm Dia. (+0.1/-0)
0.7mm Deep

Front View

23.1

21.1

Ø19.5
Clear Aperture

22.1
Wrenching Hole

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

Retaining Ring

Threaded retaining ring with the wrenching slots on the object side
1.2mm Nominal Thickness x M22.5 x P0.5

Wrenching Slots

Ø19.5

1.5x0.7 Deep

Profile View

Threaded Retaining Ring

5.5

Ø25.2 O.D.

Filter

Ø19.5 Clear Aperture

0.8

1.2

1.0

2.8

C-Mount (1.0" x 32TPI) Fully Threaded

2x Wrenching Hole
1.0mm Dia. (+0.1/-0)
0.7mm Deep

Front View

23.1

21.1

Ø19.5
Clear Aperture

22.1
Wrenching Hole

MOUNTS FOR ANY SYSTEM

Mount Sizes

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

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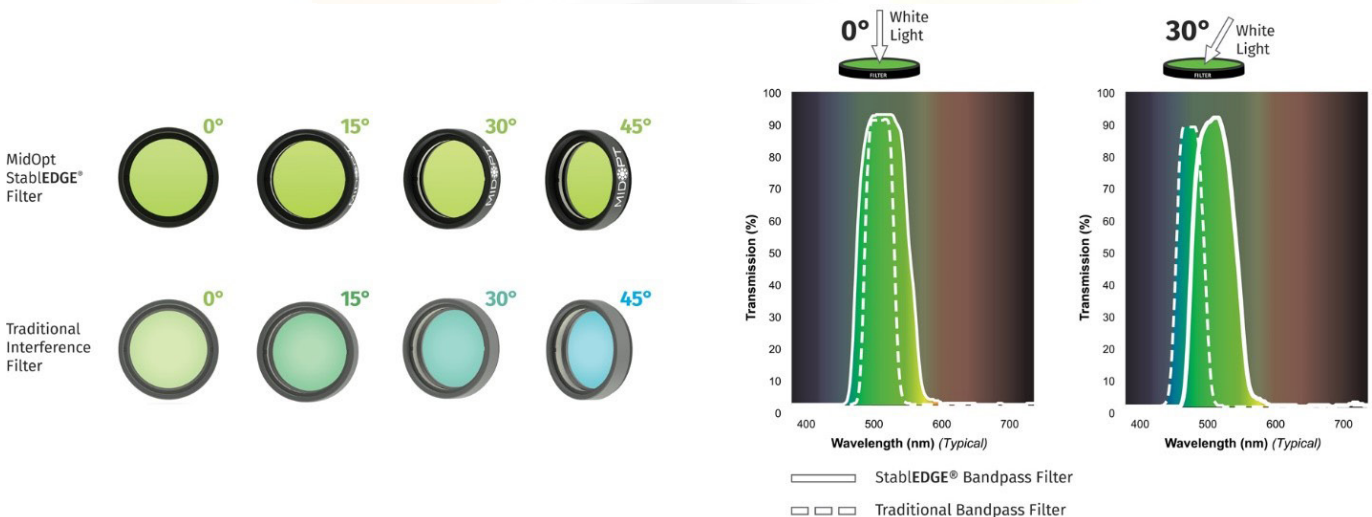
StablEDGE® filters take advantage of absorptive filter glass to form the leading edge of the filter passband. This assures no shifting in this region, even when the lens FOV exceeds 100°. Filter glasses also offer far superior lower wavelength blocking of ambient light, sharp transition slopes and unmatched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