

SP644 NEAR-IR/MID-RED DICHROIC BLOCK SHORTPASS FILTER

MidOpt Shortpass (IR-Cut) Filters

- Designed to have a sharp transition between shorter wavelengths (which are passed) and longer wavelengths (which are blocked)
- Peak transmission $\geq 90\%^*$
- Can be used with Longpass Filters for a custom, fine-tuned Bandpass Filter
- Anti-reflection coated for maximum transmission
- Exceptional surface quality; 40/20 scratch/dig
- Available in wavelength ranges from 340nm to 785nm



Shortpass Filter Information

Often thought of as “IR-cut” filters, Shortpass Filters are specifically designed to pass a broad spectrum of shorter wavelength light, while blocking longer visible (VIS) and near-infrared (NIR) wavelengths.

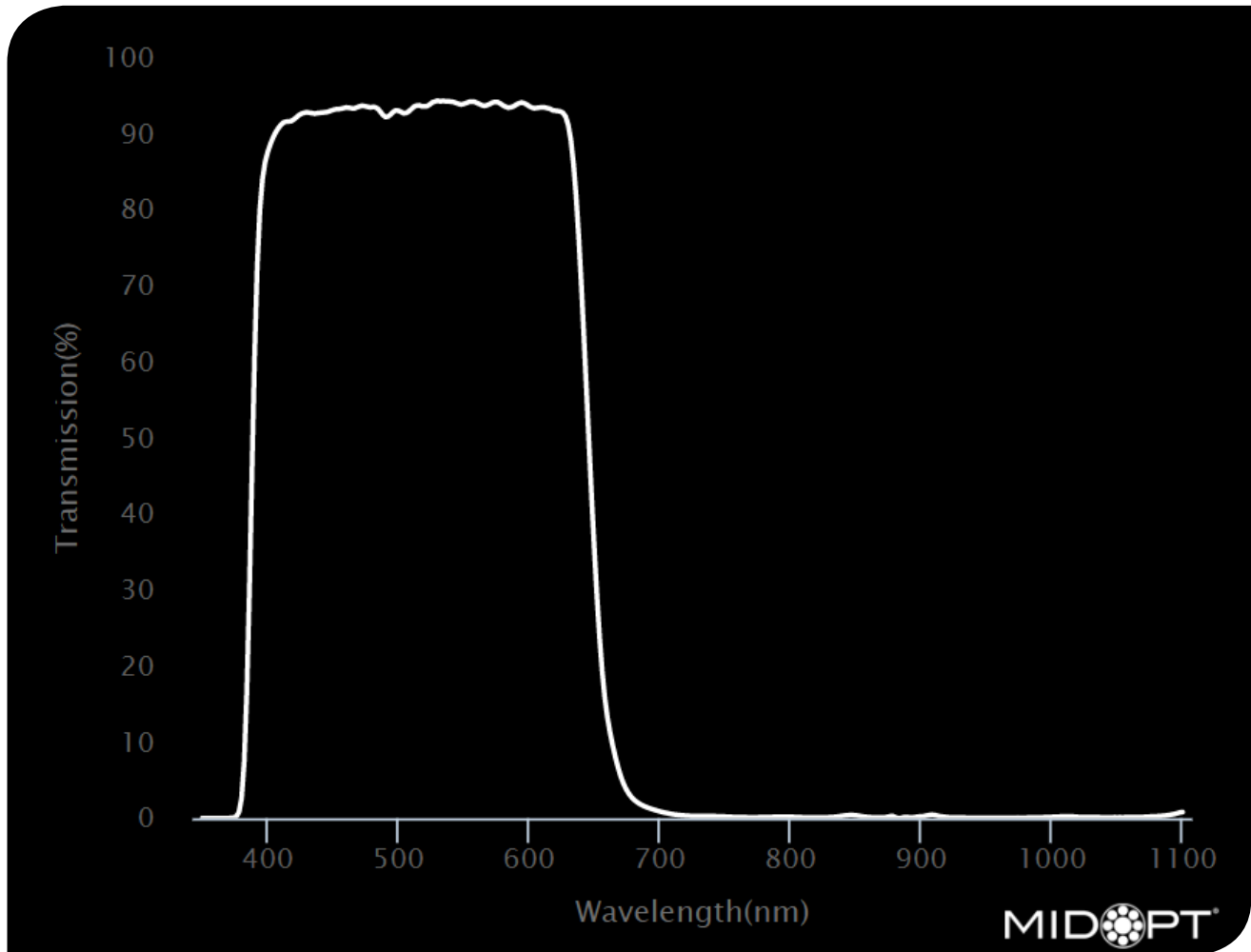
SP Series - VIS Pass/NIR Block Filters

- Commonly placed over the camera's image sensor to block NIR light and achieve natural color rendition
- Used as a hot mirror to reduce unwanted heat build-up caused by IR radiation

APPLICATIONS: Shortpass Filters are commonly used in color imaging to achieve natural color rendering. They can also be used to protect the sensor from NIR laser damage or to reduce IR radiation or “camera bloom” created during hot metal or glass extrusion processes.

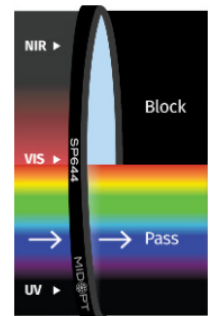
SP644

Shortpass Filter



Useful Range:	395-638nm
Cut-off Wavelength 50% T:	648nm
Tolerance:	+/- 10nm
Peak Transmission:	≥90%
Surface Quality:	40/20

SP644 is one of several dichroic filters offered mainly for use as an internal infrared blocking filter in color cameras. This design offers an attractive price/performance option compared to other designs. Uniform blocking of near-infrared wavelengths out to 1100nm, uniformly high transmission across the visible range, and a 50% point in the middle of the red portion of the spectrum make this an ideal choice for cameras with typical CMOS sensor responsivity. SP644 is useful to achieve natural color rendition with superior response in the blue channel.



SP644 TRANSMISSION DATA (TYPICAL)

Wavelength (nm)	Transmission (%)
1100	0.81
1090	0.42
1080	0.25
1070	0.16
1060	0.12
1050	0.11
1040	0.10
1030	0.13
1020	0.16
1010	0.22
1000	0.16
990	0.09
980	0.06
970	0.04
960	0.04
950	0.05
940	0.04
930	0.09
920	0.14
910	0.43
900	0.22
890	0.13
880	0.14
870	0.11
860	0.14
850	0.37
840	0.31
830	0.12
820	0.09
810	0.11
800	0.18

Wavelength (nm)	Transmission (%)
790	0.19
780	0.13
770	0.11
760	0.13
750	0.21
740	0.26
730	0.27
720	0.33
710	0.52
700	0.89
690	1.44
680	2.48
670	5.57
660	13.20
650	35.10
640	70.03
630	91.14
620	93.05
610	93.47
600	93.64
590	93.82
580	93.74
570	93.92
560	94.08
550	93.94
540	94.24
530	94.36
520	93.62
510	93.27
500	93.04
490	92.23

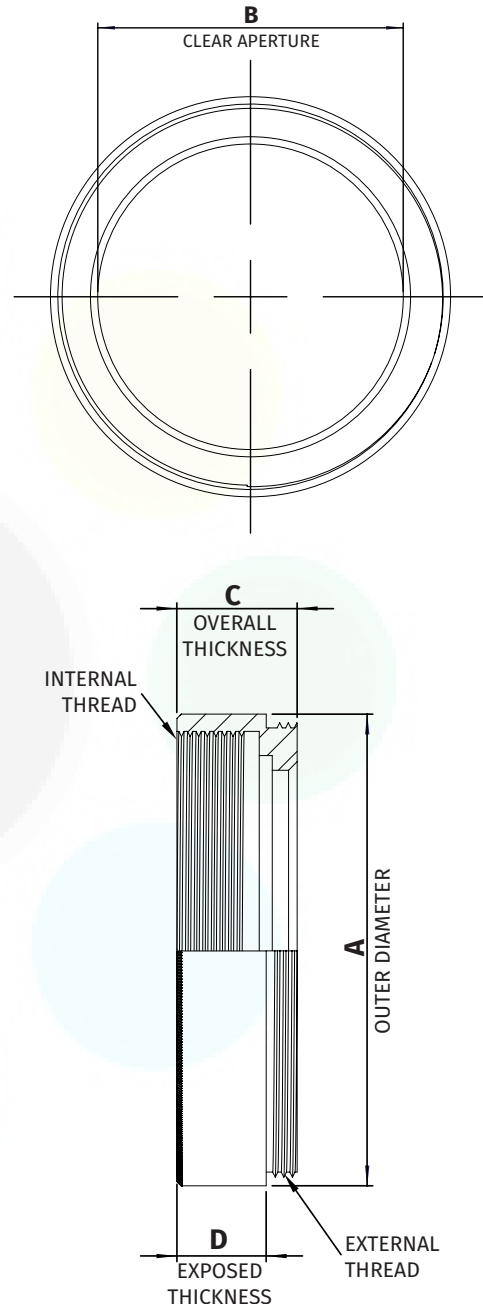
Wavelength (nm)	Transmission (%)
480	93.51
470	93.59
460	93.47
450	93.14
440	92.76
430	92.83
420	91.89
410	91.16
400	87.59
390	60.94
380	2.63
370	0.02
360	0.01
350	0.02

STANDARD THREADED MOUNT DIMENSIONS

NOTES:

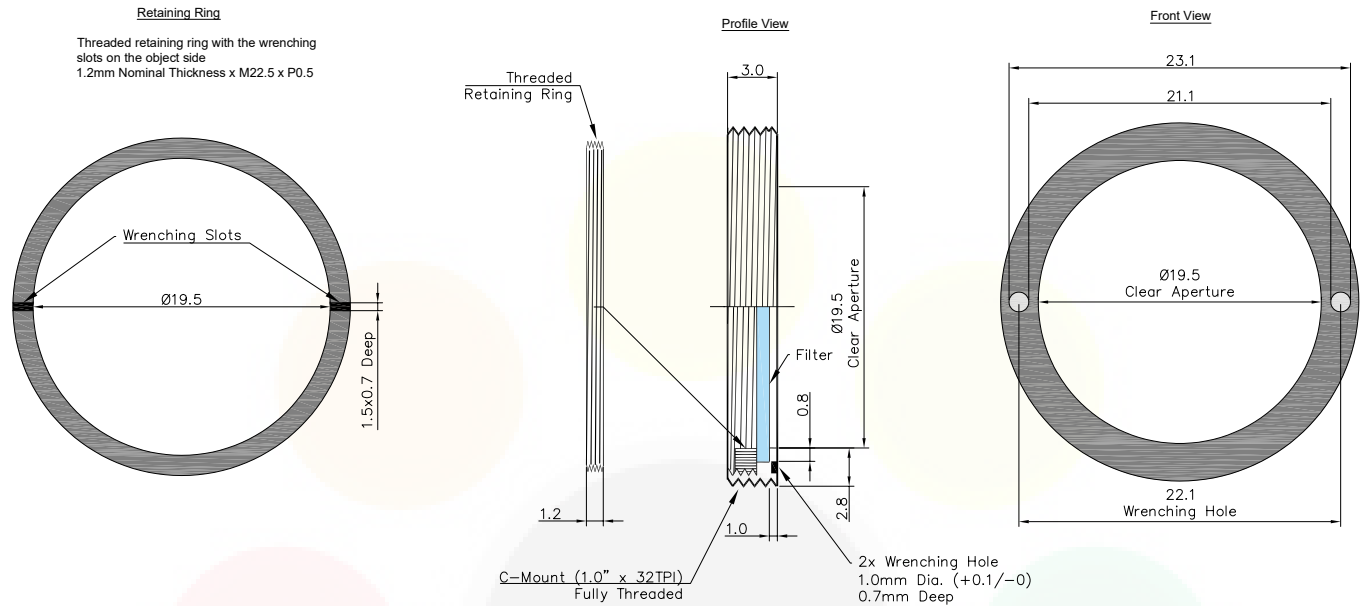
1. Inner and outer threads are of the same size and pitch.
2. Filter mount and retaining ring are black anodized aluminum.
3. All dimensions indicated in mm.
4. Tolerance: +/-0.3mm.

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).

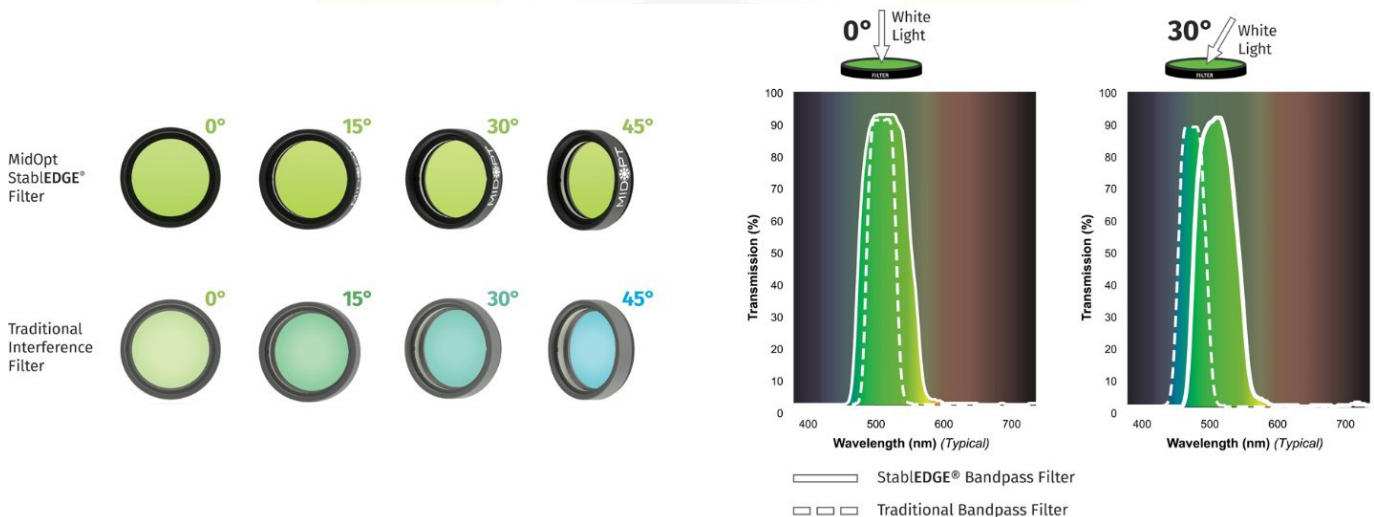


MIDOPT STABLEDGE®

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.

