

TECHSPEC®

FIXED FOCAL LENGTH LENSES



© COPYRIGHT 2017 EDMUND OPTICS, INC. ALL RIGHTS RESERVED 7/17

▶ INNOVATION STARTS HERE ...

Global Design & Support | Rapid Prototyping
Volume Manufacturing & Pricing

Contact us for a Stock or Custom Quote Today!

USA: +1-856-547-3488 | EUROPE: +44 (0) 1904 788600
ASIA: +65 6273 6644 | JAPAN: +81-3-3944-6210

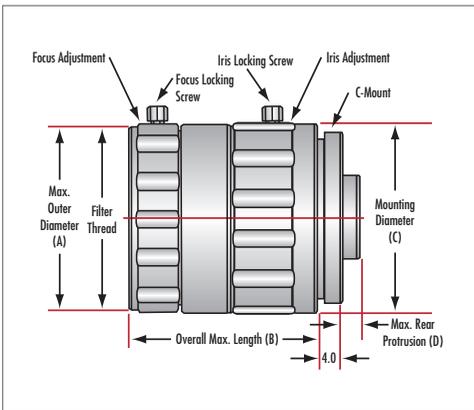
 **Edmund**
75 YEARS OF OPTICS

www.edmundoptics.com/fixed-focal



- Ultra-Compact (UC) Form Factor
- 4K Resolution Designed for Small Pixels ($\leq 2.2\mu\text{m}$)
- Optimized for $1/2.5''$ Sensors and Supports up to $1/1.8''$

Our ultra-compact, TECHSPEC® UC Series Fixed Focal Length Lenses are designed to optimize performance, cost, and size without sacrificing quality or feel. Designed for pixels that are $\leq 2.2\mu\text{m}$, these lenses provide high levels of resolution ($>200 \text{ lp/mm}$) across the sensor and are compatible with all standard C-Mount cameras. TECHSPEC® UC Series Fixed Focal Length Lenses feature focus and iris adjustments, as well as recessed set screws, and are manufactured for use at typical machine vision working distances. While they are optimized for $1/2.5''$ sensors, many focal lengths will work on sensors up to $1/1.8''$. The TECHSPEC® UC Series lenses are an outstanding option for use on all smaller format camera sensors, along with both short and long working distance applications, making them ideal for inspection, factory automation, biomedical devices, and a broad range of other applications.



DIMENSIONS					Units: mm
Focal Length	A	B	C	D	Filter Thread
4mm	40	40.6	30	2.8	M62.0 x 0.75 with required filter adapter #33-308
6mm	36	40.9	30	3.2	M34.0 x 0.5
8mm	30	34.52	30	3.2	M39.0 x 0.5 with required filter adapter #33-309
12mm	30	32.48	30	2.7	M25.5 x 0.5
16mm	30	29.13	30	3.38	M25.5 x 0.5
25mm	30	31.28	30	0	M25.5 x 0.5

TECHSPEC® UC SERIES FIXED FOCAL LENGTH LENSES						
Focal Length:	4mm	6mm	8mm	12mm	16mm	25mm
Max. Sensor Format:	$1/2''$	$1/2''$	$1/2''$	$1/1.8''$	$1/1.8''$	$1/1.8''$
Optimized Sensor Format:	$1/2.5''$	$1/2.5''$	$1/2.5''$	$1/2.5''$	$1/2.5''$	$1/2.5''$
Horizontal FOV on $1/2.5''$ Sensor:	19.4mm - 71.2°	62.54mm - 52.78°	35.65mm - 39.24°	53.2mm - 26°	71.3mm - 20.21°	46.74mm - 12.54°
Horizontal FOV on $1/2''$ Sensor:	22.9mm - 79.5°	71.38mm - 58.97°	40mm - 43.6°	60.2mm - 29.2°	80mm - 22.62°	52.5mm - 14.08°
Horizontal FOV on $1/1.8''$ Sensor:	—	—	—	68mm - 32.8°	90mm - 25.36°	59.14mm - 15.87°
Working Distance:	0mm - ∞	50mm - ∞	50mm - ∞	100mm - ∞	200mm - ∞	200mm - ∞
Aperture (f/#):	f/1.8 - f/11	f/1.85 - f/11	f/1.8 - f/11	f/1.8 - f/11	f/1.8 - f/11	f/1.85 - f/16
Distortion	<17.5%	<9.5%	<4%	<2.5%	<0.8%	<0.58%
Mount:	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount
Stock No.	#33-300	#33-301	#33-302	#33-303	#33-304	#33-305

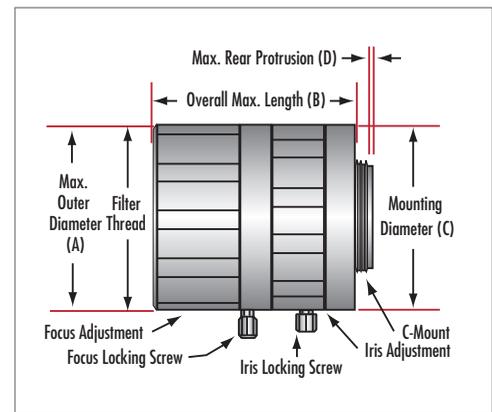
TECHSPEC® C SERIES FIXED FOCAL LENGTH LENSES

- Compact (C) Form Factor
- Industry Leading Price to Performance Ratio
- Designed for True Factory Automation

TECHSPEC® C Series Fixed Focal Length Lenses are designed for use in machine vision applications with the working distance and resolution requirements of factory automation and inspection in mind. TECHSPEC® C Series Fixed Focal Length Lenses feature large maximum apertures, allowing these high performance lenses to be used in even the most restrictive lighting conditions. Each lens has a broadband anti-reflection coating, locking iris and focus adjustment with recessed set screws, and a ruggedized, robust housing for space-restrictive applications. C Series lenses are manufactured to high tolerances, which result in high levels of imaging performance with low lens-to-lens variation. Through combining optical performance, industrial features, and compact package sizes, our TECHSPEC® C Series Fixed Focal Length Lenses are ideal for use in factory automation and inspection. **Note:** Visible and VIS-NIR options available.



DIMENSIONS						Units: mm
Focal Length	A	B	C	D	Filter Thread	
3.5mm	50.0	39.3	32.0	2.72	M105 x 1.0 with required adapter #89-848	
4.5mm	40.0	37.5	32.0	2.78	M58 x 0.75 with required adapter #87-425	
6mm	36.0	48.9	35.8	1.4	M43 x 0.75 with recommended adapter #85-308	
8.5mm	32.0	34.5	32.0	0.0	M25.5 x 0.5	
12mm	32.0	27.9	32.0	0.5	M25.5 x 0.5	
16mm	33.0	40.5	33.0	1.0	M25.5 x 0.5	
25mm	31.0	30.5	31.0	1.3	M25.5 x 0.5	
35mm	33.0	41.0	33.0	0.0	M25.5 x 0.5	
50mm	35.8	53.7	35.8	2.85	M30.5 x 0.5	
100mm	52.0	93.5	41.0	7.0	M46 x 0.75	



TECHSPEC® C SERIES FIXED FOCAL LENGTH LENSES					
Focal Length:	3.5mm	4.5mm	6mm	8.5mm	12mm
Max. Sensor Format:	1/4.8"	1/4.8"	1/4.8"	2/3"	2/3"
Horizontal FOV on Max. Sensor:	41.2mm - 102.8°	72.0mm - 84.7°	110.3mm - 62.1°	124.1mm - 59.1°	82.5mm - 39.3°
Horizontal FOV on 1/2" Sensor:	34.1mm - 94.1°	61.9mm - 76.7°	96.7mm - 55.9°	85.3mm - 42.6°	59.5mm - 28.9°
Horizontal FOV on 1/8" Sensor:	23.0mm - 74.4°	44.0mm - 59.2°	71.0mm - 42.7°	62.33mm - 31.8°	44.4mm - 21.8°
Working Distance:	0mm - ∞	25mm - ∞	75mm - ∞	100mm - ∞	100mm - ∞
Aperture (f/#):	f/2.0 - f/11	f/2.0 - f/11	f/1.4 - f/16	f/1.3 - f/16	f/1.8 - f/16
VIS Stock No.	#89-410	#86-900	#67-709	#58-000	#58-001
VIS-NIR Stock No.	N/A	N/A	N/A	N/A	N/A

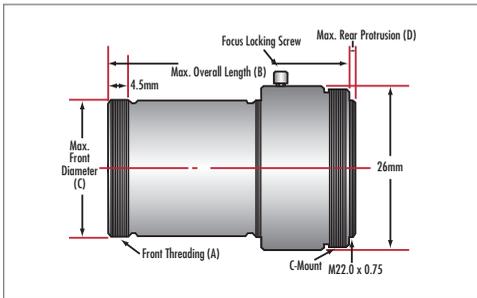
TECHSPEC® C SERIES FIXED FOCAL LENGTH LENSES						*Can be used up to 1000nm
Focal Length:	16mm	25mm	35mm	50mm	100mm	
Max. Sensor Format:	2/3"	2/3"	2/3"	2/3"	2/3"	
Horizontal FOV on Max. Sensor:	61.4mm - 30.9°	35.0mm - 19.8°	39.3mm - 14.3°	42.5mm - 8.5°	52.9mm - 4.0°	
Horizontal FOV on 1/2" Sensor:	44.5mm - 22.7°	25.4mm - 14.5°	28.5mm - 10.4°	31.0mm - 6.2°	40.1mm - 2.9°	
Horizontal FOV on 1/8" Sensor:	33.3mm - 17.1°	19.0mm - 10.9°	21.4mm - 7.8°	23.0mm - 4.6°	30.1mm - 2.2°	
Working Distance:	100mm - ∞	100mm - ∞	165mm - ∞	250mm - ∞	750mm - ∞**	
Aperture (f/#):	f/1.4 - f/16	f/1.4 - f/17	f/1.65 - f/22	f/2.0 - f/22	f/2.8 - f/22	
VIS Stock No.	#59-870	#59-871	#59-872	#59-873	#86-410	
VIS-NIR Stock No.	#67-714*	#67-715*	#67-716*	#67-717*	N/A	

**Adapter #34-237 allows 100mm Lens (#86-410) to focus down to 500mm Working Distance



- Compact Instrumentation (Ci) Versions of our C Series Lenses
- Streamlined Designs for Instrumentation Integration
- Wide Range of Fixed Aperture Options

Our TECHSPEC® Ci Series Fixed Focal Length Lenses are a streamlined version of our C Series Fixed Focal Length Lenses. They feature the same low lens-to-lens variation and broadband anti-reflection (BBAR) coating for maximum light transmission, while offering reduced weight and size. An adjustable, lockable focus allows for setting and locking the best focus position for instrumentation integration. The Ci Series offers a wide range of aperture options, ensuring maximum flexibility of resolution, throughput, and depth of field. These compact lenses are designed specifically for volume integration into applications such as factory inspection, automation, and benchtop biomedical devices.



DIMENSIONS				Units: mm
Focal Length	A	B	C	D
6mm	M34.0 x 0.5	47.8	34.0	1.17
12mm	M22.0 x 0.75	29.0	22.0	0.96
16mm	M22.0 x 0.75	40.8	22.0	1.09
25mm	M22.0 x 0.75	29.9	22.0	1.33
35mm	M25.5 x 0.5	41.0	22.5	3.82
50mm	M30.5 x 0.5	49.5	30.5	2.06

TECHSPEC® CI SERIES FIXED FOCAL LENGTH LENSES

Focal Length:	6mm	12mm	16mm	25mm	35mm	50mm	
Max. Sensor Format:	1/4.8"	2/3"	2/3"	2/3"	2/3"	2/3"	
Horizontal FOV Max. Sensor Size:	110.3mm - 62.1°	159.4mm - 41.1°	61.4mm - 30.9°	35mm - 19.8°	39.3mm - 14.3°	42.5mm - 8.5°	
Horizontal FOV Range on 1/2" Sensor:	96.7mm - 55.9°	115.0mm - 30.3°	44.5mm - 22.7°	25.4mm - 14.5°	28.5mm - 10.4°	31.0mm - 6.2°	
Horizontal FOV Range on 1/3" Sensor:	71.0mm - 42.7°	85.9mm - 22.9°	33.3mm - 17.1°	19mm - 10.9°	21.4mm - 7.8°	23.0mm - 4.6°	
Working Distance:	75mm - ∞	200mm - ∞	100mm - ∞	100mm - ∞	165mm - ∞	250mm - ∞	
Aperture (f/#) / Stock No.	f/1.4	#86-591	-	#85-348	#85-355	-	
	f/1.65	-	-	-	-	#85-362	
	f/1.8	#86-592	#86-607	#85-349	#85-356	#85-363	
	f/2	-	-	-	-	-	#86-614
	f/2.8	#86-593	#86-608	#85-350	#85-357	#85-364	#86-615
	f/4	#86-594	#86-609	#85-351	#85-358	#85-365	#86-616
	f/5.6	#86-595	#86-610	#85-352	#85-359	#85-366	#86-617
	f/8	#86-596	#86-611	#85-353	#85-360	#85-367	#86-618
f/11	-	#86-612	#85-354	#85-361	#85-368	#86-619	
f/16	-	#86-613	#85-336	#85-337	#85-338	#86-620	
Filter Adapters	M43 x 0.75	#89-940	-	-	-	-	
	M25.5 x 0.5	-	#89-941	#89-941	#89-941	-	
	M30.5 x 0.5	-	-	-	-	#89-942	
	C-Mount Front Attachment	-	-	-	-	#89-946	
	M25.5 x 0.5	-	-	-	-	-	#89-943

ACCESSORIES	
Description	Stock No.
Locking Retainer Nut (M22 x 0.75)	#89-944
C-Mount to NF-Mount Adapter	#89-945

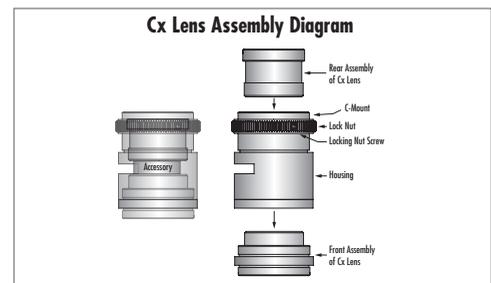
- Compact Flexible (Cx) Form Factor
- Modular 3-Piece Design
- Accommodates Interchangeable Accessories such as Liquid Lenses

TECHSPEC® Cx Series Fixed Focal Length Lenses are designed with simplicity and versatility to easily integrate into a range of application types. The modular 3-piece design allows for flexibility to integrate precision fixed apertures, internal filter holders, or liquid lenses into the assembly. These lenses also feature a simplified focus mechanism with easy to use lock nut and recessed set screws to lock focus position into place. The Cx Series lenses are ideal for applications such as machine vision, factory automation, and research and development. For further documentation information or questions regarding ease of assembly and design support, please visit our website or contact technical support. **Note:** One accessory is required for use with the Cx Series lens.



FILTER HOLDER ACCESSORY				
Aperture (f/#)*	12mm	16mm	25mm	35mm
f/1.8	#33-594	#33-601	#33-608	—
f/2.8	#33-595	#33-602	#33-609	#33-615
f/4.0	#33-596	#33-603	#33-610	#33-616
f/5.6	#33-597	#33-604	#33-611	#33-617
f/8.0	#33-598	#33-605	#33-612	#33-618
f/11.0	#33-599	#33-606	#33-613	#33-619
f/16.0	#33-600	#33-607	#33-614	#33-620

*Filter is not included with holder. Compatible with 12.5mm diameter, 1.5 or 1.0mm thick unmounted filters.



APERTURE ACCESSORY				
Aperture (f/#)	12mm	16mm	25mm	35mm
f/1.5	—	#33-637	—	—
f/1.65	—	—	—	#33-666
f/1.8	#33-624	#33-638	#33-653	#33-667
f/2.8	#33-625	#33-639	#33-654	#33-668
f/4.0	#33-626	#33-640	#33-655	#33-669
f/5.6	#33-627	#33-641	#33-656	#33-670
f/8.0	#33-628	#33-642	#33-657	#33-671
f/11.0	#33-629	#33-643	#33-658	#33-672
f/16.0	#33-630	#33-644	#33-659	#33-673

LIQUID LENS HOLDER ACCESSORY				
Compatible Liquid Lens*	12mm	16mm	25mm	35mm
Artic 25H0	#33-631	#33-645	#33-660	#33-675
Artic 39N0	—	—	—	#33-674

*Liquid lenses are not included with liquid lens holders and are sold separately. Visit our website for more information on Variable Focus Liquid Lenses.

TECHSPEC® Cx SERIES FIXED FOCAL LENGTH LENSES				
Focal Length:	12mm	16mm	25mm	35mm
Max. Camera Sensor Format:	2/3"	2/3"	2/3"	2/3"
Horizontal FOV on 2/3" Sensor:	81.4mm - 41.4°	59.9mm - 30.9°	50.8mm - 19.8°	53.6mm - 14.3°
Horizontal FOV on 1/2" Sensor:	58.7mm - 30.5°	43.4mm - 22.7°	36.8mm - 14.5°	38.9mm - 10.4°
Horizontal FOV on 1/3" Sensor:	43.8mm - 23.0°	32.5mm - 17.1°	27.6mm - 10.9°	29.2mm - 7.8°
Working Distance:	100mm - ∞	100mm - ∞	150mm - ∞	225mm - ∞
Number of Elements (Groups):	7 (7)	7 (6)	7 (6)	7 (6)
Coating:	425 - 675nm BBAR			
Length:	29.8mm	40.22mm	26.4mm	38.08mm
Diameter:	30mm	30mm	30mm	30mm
Mount:	C-Mount	C-Mount	C-Mount	C-Mount
Stock No.	#33-562	#33-563	#33-564	#33-565

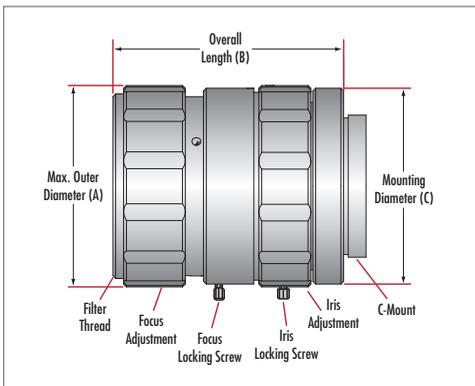
*Use Cx Lens Spanner Wrench (#35-029) for ease of assembly.

TECHSPEC® HP SERIES FIXED FOCAL LENGTH LENSES



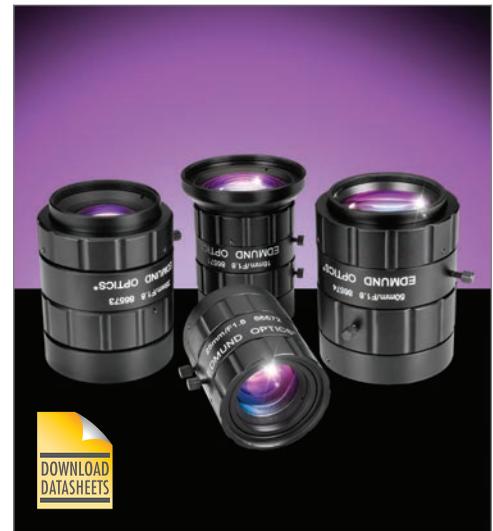
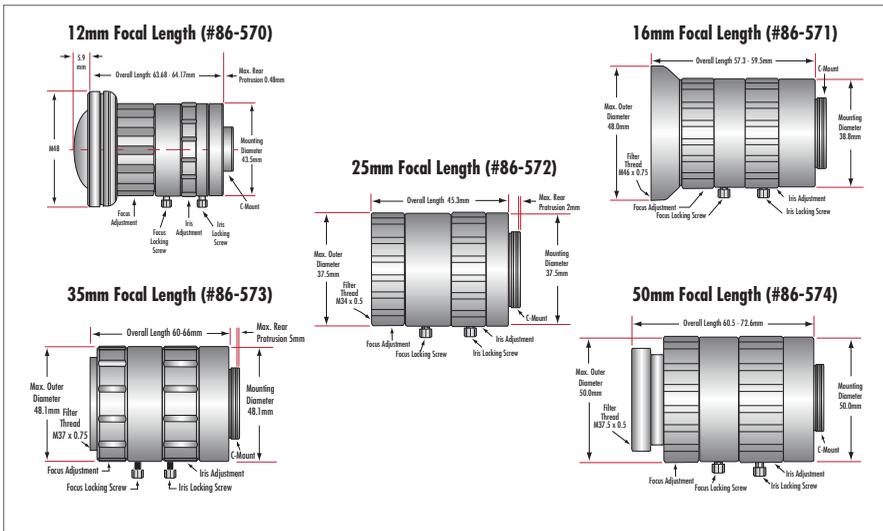
- High Performance (HP) Design
- Up to 9 MegaPixel Resolution Across the Field
- Ruggedized Housing Ideal for Factory Automation

Our TECHSPEC® HP Series Fixed Focal Length Lenses are designed for the harsh demands of factory automation and inspection applications. Our 2/3" lenses are perfect for use on high end sensors that require 145 lp/mm resolution. For larger sensors, the 12mm, 16mm, 25mm, and 35mm lenses are compatible with up to 1" sensor formats, while the 50mm lens is compatible with up to 4/3" sensor formats. All HP Series lenses feature locking focus and iris rings with recessed set screws to prevent unwanted adjustments, and a front filter thread for integrating standard optical filters for increased versatility. Having been designed with the highest level of machine vision performance in mind, these lenses offer an attractive price-to-performance ratio and are available in multiple focal lengths and sensor sizes.



DIMENSIONS				Units: mm
Focal Length	Primary WD Range	A	B	C
8.5mm	200 - ∞	42.5	44.5	33.5
12mm	150 - 500	36	41.07	35
12mm	400 - 2000	36	41.37	35
12mm	1000 - ∞	36	41.19	35
16mm	100 - 500	37	44	36
16mm	300 - 2000	37	44	36
25mm	200 - 600	37.5	34.4	36
25mm	400 - 2000	37.5	33.7	36
25mm	1500 - ∞	37.5	33.7	36
35mm	125 - 600	37.5	45	36
35mm	400 - 2000	37.5	45	36

TECHSPEC® HP SERIES FIXED FOCAL LENGTH LENSES											
Focal Length:	8.5mm	12mm	12mm	12mm	16mm	16mm	25mm	25mm	25mm	35mm	35mm
Max. Sensor Format:	2/3"	2/3"	2/3"	2/3"	2/3"	2/3"	2/3"	2/3"	2/3"	2/3"	2/3"
Aperture (f/#):	f/1.4 - 16	f/1.8 - 22	f/1.8 - 22	f/1.8 - 22	f/1.8 - 16	f/1.8 - 16	f/1.8 - 22	f/1.8 - 22	f/1.8 - 22	f/1.8 - 16	f/1.8 - 16
Min. Working Distance:	75mm	150mm	150mm	150mm	100mm	100mm	200mm	200mm	200mm	100mm	100mm
Primary WD Range:	200mm - ∞	150 - 500mm	400 - 2000mm	1000mm - ∞	100 - 500mm	300 - 2000mm	200 - 600mm	400 - 2000mm	1500mm - ∞	125 - 600mm	400 - 2000mm
Angular Field of View*:	69°	41.1°	41.7°	42°	31.2°	31.3°	19.9°	20.1°	20.2°	12.6°	12.6°
Horizontal FOV at Min WD*:	130.6mm	130mm	132mm	139mm	60mm	60mm	77mm	78mm	78mm	29mm	29mm
Resolution:	120 lp/mm	145 lp/mm	145 lp/mm	145 lp/mm	145 lp/mm	145 lp/mm	145 lp/mm	145 lp/mm	145 lp/mm	145 lp/mm	145 lp/mm
Distortion:	< -6.5%	<3.3%	<3.3%	<3.3%	<3%	<3%	<0.5%	<0.5%	<0.5%	<1%	<1%
Filter Thread:	M40.5 x 0.5	M30.5 x 0.5	M30.5 x 0.5	M30.5 x 0.5	M25.5 x 0.5	M25.5 x 0.5	M25.5 x 0.5	M25.5 x 0.5	M25.5 x 0.5	M25.5 x 0.5	M25.5 x 0.5
Mount:	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount
Stock No.	#68-215	#63-777	#63-778	#63-779	#85-865	#85-866	#63-780	#63-781	#63-782	#85-868	#85-869



TECHSPEC® HP SERIES FIXED FOCAL LENGTH LENSES					
Focal Length:	12mm	16mm	25mm	35mm	50mm
Max. Camera Sensor Format:	1"	1"	1"	1"	4/5"
Horizontal FOV on 4/5" Sensor:	—	—	—	—	75.1mm - 20.5°
Horizontal FOV on 1" Sensor:	129.6mm - 52.4°	127mm - 53°	104mm - 35°	101mm - 26°	52.9mm - 14.6°
Working Distance:	100mm - ∞	100mm - ∞	150mm - ∞	200mm - ∞	200mm - ∞
Aperture (f/#):	f/1.8 - f/16	f/1.8 - f/16	f/1.8 - f/22	f/1.8 - f/16	f/1.8 - f/16
Filter Thread:	M62 x 0.75*	M46 x 0.75	M34 x 0.5	M37 x 0.75	M37.5 x 0.5
Distortion:	<-4.2%	<-3.5%	<-2.0%	<-1.5%	<-1.0%
Weight (g):	260	195	113	252	295
Outer Diameter (mm):	48.0	38.8	37.5	48.1	50
Max. Length (mm):	63.6	59.5	45.3	66	72.6
Mount:	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount
Stock No.	#86-570	#86-571	#86-572	#86-573	#86-574

*Filter thread with filter adapter #34-236

TECHNICAL NOTE

NEED HELP SELECTING THE RIGHT LENS FOR YOUR IMAGING SYSTEM?

Download EO's TECHSPEC® Lens Data Sheets to quickly understand key factors designed to help you select and compare the right lens for your imaging system.

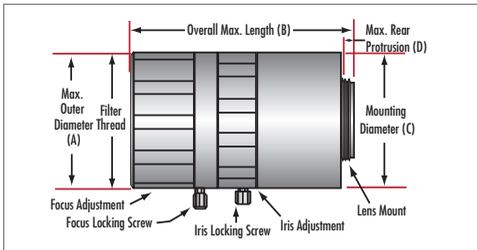
- Modulation Transfer Function (MTF)
- Distortion
- Depth of Field
- Relative Illumination

TECHSPEC® SWIR SERIES FIXED FOCAL LENGTH IMAGING LENSES



- Designed, Coated, and Tested for SWIR Wavelengths
- Compact, Lightweight, COTS Imaging Lenses
- Low f/# for High Throughput

TECHSPEC® SWIR Series Fixed Focal Length Imaging Lenses are compact, lightweight SWIR lenses designed for applications operating in the short-wave infrared (SWIR) spectrum, ranging from 0.9 – 1.7 μ m. These lenses feature SWIR-optimized optical designs, glass types, and AR coatings from 0.8 – 1.8 μ m. Designed for high throughput and superior performance, the SWIR Series lenses are commercial-off-the shelf (COTS) lenses with low f/#s, covering large 25mm sensors. TECHSPEC® SWIR Series Fixed Focal Length Lenses are ideal for a range of applications including inspection, sorting, and quality control.



DIMENSIONS						Units: mm
Focal Length	A	B	C	D	Filter Thread	
25mm, C-Mount	40	63.5	40	7.62	M34 x 0.5	
50mm, C-Mount	56	112	55	0	M43 x 0.75	
50mm, F-Mount	56	103	55	28	M43 x 0.75	
50mm, M42 x 1.0	56	124	55	0	M43 x 0.75	
100mm, C-Mount	84	180.1	84	0	M72 x 0.75	
100mm, F-Mount	84	151.1	84	0	M72 x 0.75	
100mm, M42 x 1.0	84	191.8	84	0	M72 x 0.75	

TECHSPEC® SWIR SERIES FIXED FOCAL LENGTH IMAGING LENSES										*Horizontal
Focal Length	Max. Sensor Size	Field of View @ Max. Sensor Format	Field of View*, 20.5mm Sensor	Working Distance	Aperture (f/#)	Weight	C-Mount Stock No.	F-Mount Stock No.	M42 x 1.0 Stock No.	
25mm	25.6mm	206.8mm - 55.8°	128.2mm - 35.5°	200mm - ∞	f/2.1 - f/16	180g	#83-160	N/A	N/A	
50mm	25.6mm	140.7mm - 29.8°	112.3mm - 23.4°	275mm - ∞	f/2.25 - f/22	574g	#83-165	#83-166	#83-167	
100mm	25.6mm	105.8mm - 14.6°	660mm - 9.2°	400mm - ∞	f/2.25 - f/22	1900g	#83-170	#83-171	#83-172	
C-Mount to M42 x 1.0 Adapter (5.8mm Back Flange)										#83-151
100mm SWIR Lens Mount										#89-995

TECHNICAL NOTE

WHAT IS SWIR?

Short-Wave Infrared (SWIR) light is typically defined as light in the 0.9 - 1.7 μ m wavelength range, but can also be classified from 0.7 - 2.5 μ m. Since silicon sensors have an upper limit of approximately 1.0 μ m, SWIR imaging requires unique components capable of performing in the SWIR range. Indium Gallium Arsenide (InGaAs) sensors are the primary sensors used in SWIR, covering the typical SWIR band, but can extend as low as 550nm to as high as 2.5 μ m. Although linear line-scan InGaAs sensors are commercially available, area scan InGaAs sensors are typically ITAR restricted, but are available for a number of commercial applications with proper licenses. SWIR imaging lenses are specially designed, optimized, and anti-reflection coated for SWIR wavelengths.

WHY USE SWIR?

Unlike Mid-Wave Infrared (MWIR) and Long-Wave Infrared (LWIR) light, which is emitted from the object itself, SWIR is similar to visible light in that photons are reflected or absorbed by an object, providing the strong contrast needed for higher resolution imaging. Ambient star light and background radiance (nightglow) are natural emitters of SWIR and provide excellent illumination for outdoor, nighttime imaging.

It is essential to use a lens that is both designed and coated for the SWIR wavelength band. Using a lens designed for the visible spectrum will result in low resolution images and higher optical aberrations. Since SWIR wavelengths transmit through glass, lenses and other optical components (filters, windows, etc.) designed for SWIR can be manufactured using the same techniques used for visible components, decreasing manufacturing cost and enabling the use of protective windows and filters within a system.

A large number of applications that are difficult or impossible to perform using visible light are possible using SWIR. When imaging in SWIR, water vapor, fog, and certain materials such as silicon are transparent. Additionally, colors that appear almost identical in the visible may be easily differentiated using SWIR.

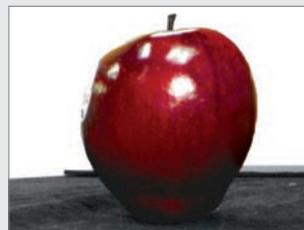
EDMUND OPTICS® IS YOUR SWIR EXPERT

Capable of manufacturing and assembling in volume to the highest standards, Edmund Optics® is experienced in designing, manufacturing, and coating SWIR lenses. Edmund Optics® offers lens assemblies designed with glasses that are optimized for performance in the SWIR spectrum, and our SWIR AR coatings are specially designed for maximum transmission of SWIR wavelengths.

SWIR APPLICATIONS

- Electronic Board Inspection
- Solar Cell Inspection
- Identifying and Sorting
- Produce Inspection
- Surveillance
- Anti-Counterfeiting
- Process Quality Control

WANT TO LEARN MORE? VISIT WWW.EDMUNDOPTICS.COM/SWIR



A SWIR imaging system can identify bruises on fruit not apparent in a visible image

TECHSPEC® LF SERIES FIXED FOCAL LENGTH LENSES

- Covers Large Format (LF) Sensors up to 43.3mm Diagonal
- F-Mount Compatible
- Compatible with 2k - 8k Line Scan Cameras and Mid-Sized Area Scan Arrays

TECHSPEC® LF Series Fixed Focal Length Lenses are designed for use with 2k, 4k, 6k, and 8k line scan cameras and mid-sized area scan arrays. Optimized for machine vision working distances, LF Series lenses feature high resolving powers to easily detect small defects. Additionally, these lenses also feature a lockable focus and iris, which is ideal for factory automation applications where vibrations can cause performance decreases. TECHSPEC® LF Series Fixed Focal Length Lenses are ideal for use in machine vision, web inspection, sorting, and identification applications. **Note:** 28mm focal length does not work on all F-mount cameras. Camera F-mount must have an inner diameter greater than 42mm.



TECHSPEC® LF SERIES FIXED FOCAL LENGTH LENSES				*Minimum Working Distance to ∞	
Focal Length:	28mm Short**	28mm Long**	50mm	100mm	
Max. Camera Sensor Format:	35mm	35mm	35mm	35mm	
Aperture (f/#):	2.8 - 22	2.8 - 22	2.0 - 22	2.8 - 22	
Distortion (%):	<3%	<4%	<1%	<1%	
Horizontal FOV on 35mm Sensor*:	540mm - 67.0°	960mm - 68.4°	360mm - 39.8°	162mm - 20.4°	
Min. Working Distance:	400mm	700mm	500mm	500mm	
Filter Thread:	M67 x 0.75	M67 x 0.75	M43 x 0.75	M46 x 0.75	
Max. Rear Protrusion:	33mm	33mm	10.6mm	0mm	
Diameter:	71mm	71mm	56mm	61mm	
Max Length:	106.7mm	106.0mm	43mm	104mm	
Mount:	F-Mount	F-Mount	F-Mount	F-Mount	
Weight:	547g	547g	225g	565g	
Stock No.	#85-199	#85-200	#85-203	#85-204	

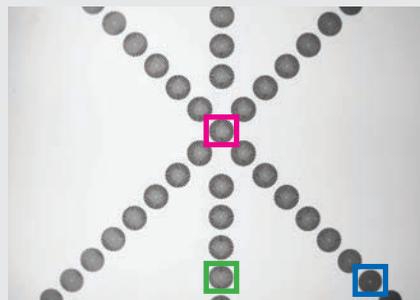
**28mm focal length does not work on all F-Mount cameras. Camera F-Mount must have ID greater than 42mm.

TECHNICAL NOTE

HOW IMPORTANT IS RESOLUTION?

WHAT DOES A STAR TARGET TELL US?

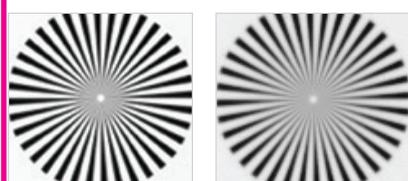
- Align System Tilt for Accurate Comparison
- Easily Compare Contrast in the Center and Corner of the Field of View
- Quickly Evaluate Lenses for Best Resolution



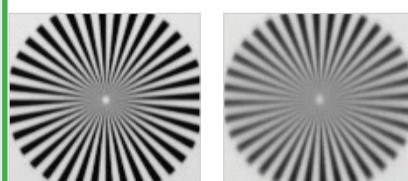
EDMUND OPTICS® FIXED FOCAL LENGTH LENSES

- High Resolution from Center to Corner for Maximum Usable Field
- Superior Contrast for Highest MTF
- Designed for Real-World Conditions and Variety of Working Distances

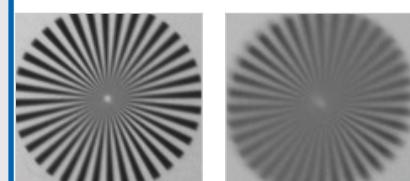
CENTER OF IMAGE EDMUND OPTICS® COMPETITION



BOTTOM OF IMAGE EDMUND OPTICS® COMPETITION



CORNER OF IMAGE EDMUND OPTICS® COMPETITION





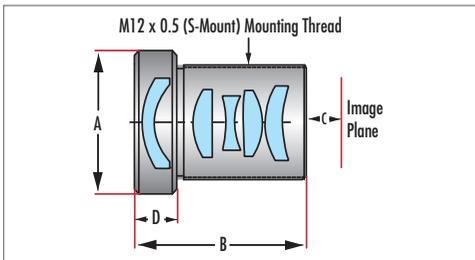
- High Resolution Red Series, HEO (Harsh Environment) Series, and Standard Versions Available
- Full Prescription Data Available Online
- Lens Coatings Optimized for VIS or NIS Imaging

TECHSPEC® Red Series M12 μ-Video™ Imaging Lenses feature a high resolution design that's optimized for the infinite conjugate working distance. For harsh environment applications, TECHSPEC® HEO Series M12 μ-Video™ Imaging Lenses are ideal because they are sealed in a ruggedized enclosure. Standard micro-video lenses are also available. All three lens options are ideal for long working distance, infinity applications.

TECHSPEC® HEO SERIES M12 μ-VIDEO™ IMAGING LENSES

*Horizontal at max. sensor format

Focal Length	Max. Sensor Format	f/#	Angular FOV*	Min. Working Distance	Dimensions (mm)				VIS – 425 to 675nm		NIR – 600 to 1050nm	
					A	B	C	D	Stock No.	Stock No.		
2.2mm	1/8"	f/2.0	110°	400mm	21.0	16.4	2.2	5.4	#58-840		#58-844	
3.6mm	1/8"	f/2.5	85°	400mm	14.0	14.1	4.5	4.5	#58-841		#58-845	
8.0mm	1/2"	f/1.9	46°	400mm	14.0	15.0	8.7	4.0	#63-759		#63-761	



TECHSPEC® RED SERIES M12 μ-VIDEO™ IMAGING LENSES

*Horizontal at max. sensor format

Focal Length	Max. Sensor Format	f/#	Angular FOV*	Min. Working Distance	Dimensions (mm)				Stock No.
					A	B	C	D	
3.6mm	1/8"	f/2.5	82.5°	400mm	14	14.6	4.5	4.2	#57-907
4.4mm	1/8"	f/1.9	65.8°	400mm	14	24	6.4	3.8	#57-908
6.4mm	1/8"	f/1.9	43.7°	400mm	14	30	10.2	3.8	#57-909
7.2mm	1/8"	f/1.8	39.2°	400mm	14	22.2	8.25	4.0	#57-910
8.0mm	1/2"	f/1.9	46.0°	400mm	14	15	8.7	4.0	#69-255

STANDARD INFINITE CONJUGATE M12 μ-VIDEO™ IMAGING LENSES

*Horizontal at max. sensor format. **Filter at 650nm

Focal Length	Max. Sensor Format	f/#	Angular FOV*	Min. Working Distance	Dimensions (mm)				IR Cut** Stock No.	No-IR Cut Stock No.
					A	B	C	D		
1.68mm	1/4"	f/2.5	133.9°	400mm	15.0	13.2	3.3	2.8	#66-880	#59-776
1.74mm	1/4"	f/2.8	114.4°	400mm	21.0	19.6	3.3	3.2	#66-881	#56-774
1.9mm	1/4"	f/2.0	118°	400mm	17.0	14.5	4.2	4.0	#66-882	#64-106
2.2mm	1/8"	f/2.5	130°	400mm	17.0	18.3	4.8	3.7	#66-883	#55-569
2.5mm	1/8"	f/2.5	112°	400mm	17.0	20.1	4.6	3.8	#66-884	#57-681
2.9mm	1/8"	f/2.0	96°	400mm	15.0	17.4	5.2	5.8	#66-885	#55-570
3.0mm	1/8"	f/2.0	98.7°	300mm	14.0	15.1	5.3	3.9	#66-886	#59-778
3.9mm	1/8"	f/2.0	74°	400mm	14.0	16.0	5.9	4.0	#66-888	#57-683
6.0mm	1/8"	f/1.7	44°	400mm	15.0	15.3	8.0	6.0	#66-890	#57-684
6.4mm	1/8"	f/2.4	42.2°	400mm	14.8	13.1	5.3	3.3	#66-891	#55-573
8.0mm	1/8"	f/2.5	30.9°	800mm	15.0	13.5	5.8	3.0	#66-892	#55-574
10.1mm	1/2"	f/2.8	36°	400mm	15.0	13.4	6.1	3.2	#59-779	#63-762
10.4mm	1/2"	f/2.8	35°	400mm	14.0	12.0	6.4	4.0	#64-107	#65-251
12.0mm	1/8"	f/2.0	22.3°	800mm	14.0	12.0	6.4	4.0	#66-893	#56-775
16.0mm	1/8"	f/2.0	17°	400mm	14.0	14.4	8.0	4.5	#66-894	#64-108
25.0mm	1/8"	f/2.5	10.7°	200mm	25.0	23.5	8.0	6.7	#66-895	#56-776
35.0mm	3/8"	f/2.0	17°	200mm	25.0	23.4	15.8	16.4	#66-896	#59-780
50.0mm	1/2"	f/2.5	6.8°	400mm	27.0	48.8	8.0	41.8	#66-897	#59-781

TECHSPEC® FINITE CONJUGATE M12 μ-VIDEO™ LENSES

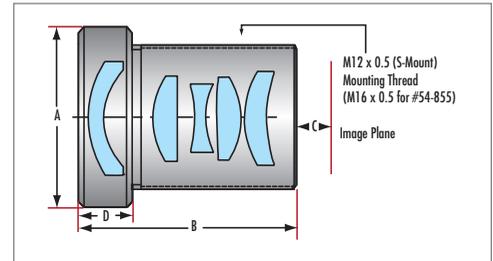
- Standard Green Series and High Resolution Blue Series Available
- All Glass Design to Maximize Performance
- 2D and 3D Models Available Online

TECHSPEC® Blue Series M12 μ-Video™ Imaging Lenses feature a high resolution design that's optimized for finite conjugate working distances. Standard resolution versions, TECHSPEC® Green Series M12 μ-Video™ Imaging Lenses, are also available. Both options are an excellent choice for short, close range working distance applications.



GREEN SERIES DIMENSIONS						Units: mm
Focal Length	A	B	C ¹	D	Mounting Thread	
6.0mm	14.0	11.70	4.0 - 3.9	3.5	M12 x 0.5	
8.0mm	14.0	20.40	8.9 - 8.7	6.0	M12 x 0.5	
12.0mm	16.0	19.50	7.1 - 6.75	6.0	M12 x 0.5	
25.0mm	18.0	24.40	12.6 - 11.9	9.0	M16 x 0.5	

BLUE SERIES DIMENSIONS						Units: mm
Focal Length	A	B	C ¹	D	Mounting Thread	
3.0mm	14.0	17.1	4.8 - 4.7	5.8	M12 x 0.5	
4.0mm	14.0	19.7	6.1 - 6.0	4.4	M12 x 0.5	
5.0mm	14.0	14.6	4.0 - 3.9	3.7	M12 x 0.5	
6.0mm	14.0	14.1	6.9 - 6.8	4.5	M12 x 0.5	
8.0mm	14.0	12.3	8.8 - 8.6	3.7	M12 x 0.5	
10.0mm	14.0	17.0	6.6 - 6.3	3.7	M12 x 0.5	
12.5mm	15.0	22.9	10.1 - 9.7	4.8	M12 x 0.5	
17.5mm	14.0	20.7	5.8 - 4.9	7.6	M12 x 0.5	
25.0mm	18.0	30.0	8.5 - 6.5	11.5	M12 x 0.5	



TECHSPEC® GREEN SERIES M12 μ-VIDEO™ IMAGING LENSES						¹ For optimized working distance	² Horizontal at max. sensor	
Focal Length	Max. Sensor Format	f/#	Primary Magnification	Field of View* ¹ (mm)	Working Distance (mm)	Optimized Working Distance (mm)	Distortion Diag. @ Full Field	Stock No.
6.0mm	1/3"	f/2.0**	0.039 - 0.023X	170 - 182	150 - 400	100 - 200	-8.6%	#87-231
8.0mm	1/3"	f/1.9	0.053 - 0.032X	95 - 156	150 - 400	150 - 250	-4.7%	#54-853
12.0mm	1/2"	f/2.0	0.081 - 0.049X	80 - 134	150 - 400	150 - 250	-2.1%	#54-854
25.0mm	1/2"	f/2.1	0.107 - 0.075X	60 - 86	250 - 350	250 - 350	-1.9%	#54-855

**See website for additional f/# options

TECHSPEC® BLUE SERIES M12 μ-VIDEO™ IMAGING LENSES						¹ For optimized working distance	² Horizontal at max. sensor				
Focal Length	Max. Sensor Format	Primary Magnification	Field of View* ¹ (mm)	Working Distance (mm)	Optimized Working Distance (mm)	Distortion (%)		Stock No.			
						Diagonal	Horiz.	f/2.5	f/4.0	f/5.6	f/8.0
3.0mm	1/3"	0.029X - 0.015X	315 - 622	100 - 400	100 - 200	-34.7%	-21.8%	#89-340	#89-341	#89-342	#89-343
4.0mm	1/3"	0.026X - 0.016X	307 - 509	150 - 400	150 - 250	-25.1%	-15.1%	#89-344	#89-345	#89-346	#89-347
5.0mm	1/3"	0.033X - 0.020X	163 - 270	150 - 400	150 - 250	-20.0%	-11.6%	#58-201	#69-260	#83-938	#83-949
6.0mm	1/3"	0.040X - 0.024X	132 - 220	150 - 400	150 - 250	-15.0%	-9.2%	#58-202	#69-261	#83-939	#83-950
8.0mm	1/3"	0.053X - 0.032X	92 - 154	150 - 400	150 - 250	-6.5%	-4.0%	#58-203	#69-262	#83-940	#83-951
10.0mm	1/3"	0.068X - 0.040X	72 - 120	150 - 400	150 - 250	-1.5%	-0.87%	#58-204	#69-263	#83-941	#83-952
12.5mm	1/2"	0.084X - 0.050X	76 - 128	150 - 400	150 - 250	-0.9%	-0.61%	#58-205	#69-264	#83-942	#83-953
17.5mm	1/2"	0.130X - 0.076X	51 - 87	150 - 400	150 - 250	0.9%	0.60%	#58-206	#69-265	#83-943	#83-954
25.0mm	1/2"	0.190X - 0.110X	35 - 60	150 - 400	150 - 250	0.3%	0.14%	#58-207	#69-266	#83-944	#83-955

TECHSPEC® μ-VIDEO™ IMAGING LENS ACCESSORIES

- C-Mount to M12 Adapters with or without O-Ring
- Lock Nut to Secure Lens in any Holder
- Camera Board Adapter for Design Integration

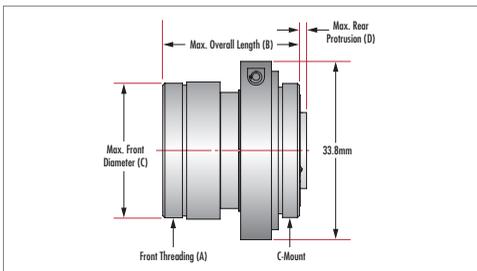
μ-VIDEO™ IMAGING LENS ACCESSORIES	
Description	Stock No.
C-Mount to μ-Video™ Lens Adapter	#53-675
C-Mount To μ-Video™ Lens Adapter w/O-Ring	#59-241
M12 μ-Video™ Lens Holder for Camera Boards	#66-382
M12 Lock Nut For μ-Video™ Lenses	#64-102





- **Stability Ruggedized to Maintain Pointing Stability After Shock and Vibration**
- **Compact Ruggedized (Cr) Versions of our C Series Lenses**
- **Individual Optics Glued in Place to Reduce Pixel Shift**

TECHSPEC® Cr Series Fixed Focal Length Lenses are Stability Ruggedized, protecting the lens from damage while maintaining optical pointing and positioning after shock and vibration. All individual lens elements are glued in place to reduce object shift on the image. In addition, these lenses feature robust mechanics with a simplified focus and stainless steel locking C-mount clamp. TECHSPEC® Cr Series Fixed Focal Length Lenses are ideal for calibrated imaging systems such as measurement and gauging, 3D stereo vision, robotics and sensing, autonomous vehicles, and object tracking. The object to image mapping is maintained even after heavy shock and vibration; if the center of the object maps onto the center pixel, it will always map to that same center pixel.



DIMENSIONS				Units: mm
Focal Length	A	B	C	D
6mm	M34.0 x 0.5	48.19	36	1.17
12mm	M25.5 x 0.5	31.91	26	0
16mm	M25.5 x 0.5	42.78	26	1.09
25mm	M25.5 x 0.5	32.38	26	1.33

TECHSPEC® C- SERIES FIXED FOCAL LENGTH LENSES				
Focal Length:	6mm	12mm	16mm	25mm
Max. Camera Sensor Format:	1/4.8"	2/3"	2/3"	2/3"
Horizontal FOV on Max Sensor:	110.3mm - 62.1°	82.5mm - 39.3°	61.4mm - 30.9°	35mm - 19.8°
Horizontal FOV on 1/2" Sensor:	96.7mm - 55.9°	59.5mm - 28.9°	44.5mm - 22.7°	25.4mm - 14.5°
Horizontal FOV on 1/3" Sensor:	71.0mm - 42.7°	44.4mm - 21.8°	33.3mm - 17.1°	19mm - 10.9°
Working Distance:	75mm - ∞	98mm - ∞	98mm - ∞	98mm - ∞
Number of Elements (Groups):	9 (7)	7 (7)	7 (6)	7 (6)
Coating:	425 - 675nm BBAR	425 - 675nm BBAR	425 - 675nm BBAR	425 - 675nm BBAR
Lens Mount:	C-Mount	C-Mount	C-Mount	C-Mount
Weight:	97g	55.4g	61.9g	52.4g
Aperture (f/#) / Stock No.	f/1.4	#35-139		#35-163
	f/1.8	#35-140	#35-155	#35-164
	f/2.8	#35-141	#35-156	#35-165
	f/4	#35-142	#35-157	#35-166
	f/5.6	#35-143	#35-158	#35-167
	f/8	#35-144	#35-159	#35-168
	f/11	-	#35-160	#35-169
Filter Adapters / Stock No.	M30.5 x 0.5 Filter Adapter	-	#89-942	#89-942
	M43 x 0.75 Filter Adapter	#89-940	-	-

Contact us for a Stock or Custom Quote Today!

USA: +1-856-547-3488 | EUROPE: +44 (0) 1904 788600
 ASIA: +65 6273 6644 | JAPAN: +81-3-3944-6210

