

# INDUSTRIAL FILTERS



**Your partner for optical and opto-mechanical components and subassemblies for machine vision and other industrial imaging applications.**

### **The Company:**

The Schneider-Group, founded in 1913 in Bad Kreuznach, Germany, is a market leader in high quality lenses for industrial applications, photographic lenses and filters for professionals, and has a worldwide market and performance leadership in high quality cinema projection lenses. Since establishment, we have manufactured in total more than 15 million lenses and have more than 5000 optical designs.

### **Our Mission:**

By providing high quality optical solutions for image processing applications, we help system integrators and equipment manufacturers to enhance their vision systems. Our engineering and product developments are driven by long-term partnerships with our customers. We respect our people as the fundamental success factor and we trust in their commitment to solve our customer's problems.

### **Our competitive advantages:**

Based on our 90-years tradition in optics, we have gained world class expertise in optical design & manufacturing that allows us not only to make excellent products but also to provide professional consultancy and support contributing to the success of our customers. In addition to an extensive variety of high quality optical and mechanical standard products, we offer personal attention and flexibility toward customization.

### **90 years of competence:**

In our R&D department we do optical and mechanical system design, thin film coating development, electronic system development and the development of measurement equipment and corresponding software. We are proud of our optical lab that is equipped with a unique computer-assisted MTF Test Bench for infinite and finite object distances. Our manufacturing floor uses modern CNC machines for the mechanical production. We also do turning, milling, sandblasting, anodizing, laser engraving and assembling. Our optical production capabilities include spherical, cylindrical and aspherical lens elements, grinding, polishing, centering and cementing. We have our own thin film coating technology that uses ion-plating and ion-assisted coating at low temperature.

### **The new product line of industrial filters:**

Schneider Kreuznach has a long and successful history in the photographic filter market. The leading brand B+W Filters satisfies all requirements of professionals and amateur photographers alike. Choosing Industrial Applications to be one of Schneider Kreuznach's strategic target markets has consequently directed us to start a new product line of high performance technical filters that have been adapted to the requirement of industrial users in research, engineering and production. These products have emerged out of the B+W product line by improving the optical quality, characterizing and specifying important technical parameters and by implementing a strict quality assurance process. This catalog shows the detailed technical specifications of our new industrial filter products, including anti-reflection coatings and new filter mounts with additional features such as locking mechanisms.

### **Content:**

<b>UV &amp; IR Cut Filters</b>	<b>4-5</b>
<b>Infrared Filters</b>	<b>6-7</b>
<b>Red &amp; Yellow Filters</b>	<b>8-9</b>
<b>Green &amp; Blue Filters</b>	<b>10-11</b>
<b>Neutral Density Filters</b>	<b>12-13</b>
<b>Polarization Filters</b>	<b>14-15</b>
<b>Custom Filters</b>	<b>16-17</b>
<b>Anti-reflection Coatings</b>	<b>18-19</b>
<b>Filter Mounts</b>	<b>20-22</b>
<b>Custom specific products</b>	<b>23</b>

## Our Range of Products



### Industrial Optics

Optical and opto-mechanical components and subassemblies for machine vision and other image processing applications: C-mount lenses, modular macro system, telecentric lenses, 3-CCD lenses, industrial filters and customized OEM solutions.



### Photo-optics

Photographic and enlarging lenses of the very highest order for all areas of professional photography, both analog and digital, from 35 mm to large format.



### B+W filters

The leading brand for demanding professionals and amateur photographers for creative photography in conjunction with best image quality: correction and contrast filters for color and black & white photos, K&S polarization filters, close-up lenses, special-effect and trick lenses, filters with SLIM-mounts for pictures free from vignetting with wide-angle zoom and fixed focal-length lenses.



### Cinema projection

High-performance cinema projection lenses for 16 mm, 35 mm, and 70 mm film, anamorphic close-up lenses, wide-angle projection lenses for 70 mm film with 8 or 10 pitch, test films for 35 mm projection.



### Digital projection

A new cine-digital series for digital high-performance projectors, with lenses tightly staggered in fixed focal lengths, and anamorphic projection lenses which can be relied on for contrast and sharpness of detail. The areas of application of these new lenses extends from digital cinema through fixed installations in front and rear projection to applications for rental and staging.



### Ophthalmic optics

Eyeglass lenses of glass and plastic; single-focus, multifocal, and gradient-focus lenses of high-refractive materials with special glass configuration for better appearance and wearing comfort.



### Servo-hydraulic system

Electro-hydraulic and electro-pneumatic servo valves with high-grade electronic control units for precise position, speed, power, and pressure adjustments in machine construction.

# UV & IR Cut Filters



Call us for OEM versions

UV-cut filters are long pass filters that block the UV wavelength range and transmit the visible. These filters use an absorptive glass, which is robust, cost-effective and insensitive to angle of incidence. In machine vision applications they are used in front of a lens on a CCD or CMOS camera to protect the sensor from UV light, in absence of internal protection in the camera. In addition, they are often used to

protect expensive lenses from potential damage. The IR-cut filter is a short pass filter that blocks infrared light and transmits the visible; also based on an absorptive glass. The UV-IR cut filter is the combination of a UV cut and a IR cut in one single filter using a UV cut absorptive glass with a thin film layer system as an interference IR cut coating.

## Key Features

- Combined UV-IR cut filter in one to transmit visible range
- Cost-effective UV cut filters as lens protection
- Available in mounts with all common thread sizes

## Applications

- Machine Vision and other imaging applications
- Scientific & research measurement

## Technical Specifications<sup>1</sup>

Filter Type:	010 UV cut	486 UV-IR cut	489 IR cut
Pass wavelength range:	> 365 nm ± 10 nm	390 ± 15 nm – 690 ± 20 nm	visible
Surface:	5/2 × 0.16 <sup>2</sup>	5/2 × 0.16 <sup>2</sup>	5/2 × 0.16 <sup>2</sup>
Wavefront distortion <sup>3</sup> :	1 λ	1 λ	1 λ
Parallelism:	1 arc minute	1 arc minute	1 arc minute
Diameter tolerance:	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm
Thickness:	2.0 ± 0.2 mm	2.0 ± 0.2 mm	2.0 ± 0.2 mm

<sup>1</sup> Specifications for unmounted and uncoated versions

<sup>2</sup> Surface specification according to ISO 10110, quality usually similar to MIL 80-50 scratch-dig or better

<sup>3</sup> Per 30 mm at 633 nm

**ORDER INSTRUCTIONS:**

		Ix - Type - Coating - Mount - Size			
<b>IF:</b>	mounted filter	└───┘	└───┘	└───┘	└───┘
<b>IFG:</b>	unmounted Filter	└───┘	└───┘	└───┘	└───┘
<b>Type:</b>	010, 486, 489	└───┘	└───┘	└───┘	└───┘
<b>Coating:</b>	Typ 010, 489: no coating, E, MRC Typ 486 is always MRC coated.	└───┘	└───┘	└───┘	└───┘
<b>Mount:</b>	SN1 for standard threaded mount (IF only)	└───┘	└───┘	└───┘	└───┘
<b>Size:</b>	for IF: thread of the mount for IFG: diameter in mm	└───┘	└───┘	└───┘	└───┘



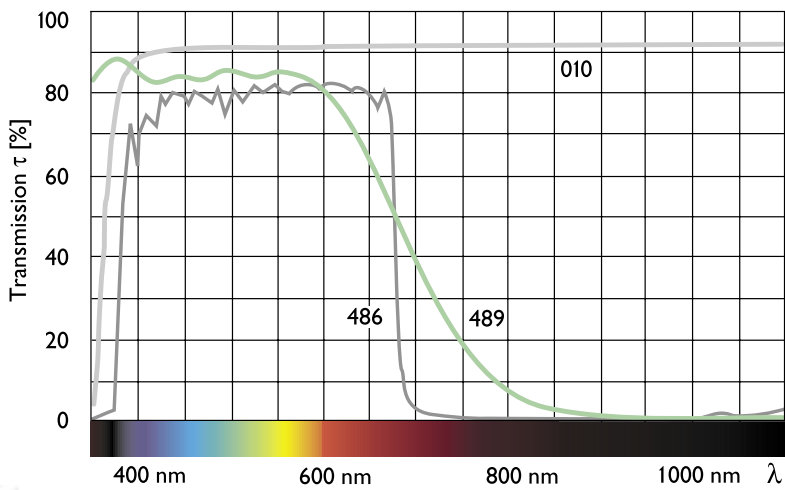
**Examples:**

IF - 010 - E - SN1 - 25.5

(010 filter with MgF<sub>2</sub> coating on both sides, mounted for M25.5)

IFG - 486 - 30

(unmounted 486 filter with 30 mm diameter)



# UV & IR CUT FILTERS

# Infrared Filters



Call us for OEM versions

Infrared Filters are long-pass filters that block the visible light and pass IR light. They are characterized by their cut-on wavelength, typically the wavelength at which the transmission is 50% of the maximum. These filters use absorptive glasses, that are robust, cost-effective and insensitive to angle of incidence. In

machine vision, one of their typical applications, they are used in front of a lens on a CCD or CMOS camera when the image is to be taken at wavelength in the near infrared. These filters are available unmounted or in mounts with all common thread sizes.

## Key Features

- Insensitive to angle of incidence
- Available in mounts with all common thread sizes
- Absence of vignetting due to large clear aperture

## Applications

- Machine Vision and other imaging applications
- Night Vision
- Scientific & research measurement in the NIR

## Technical Specifications<sup>1</sup>

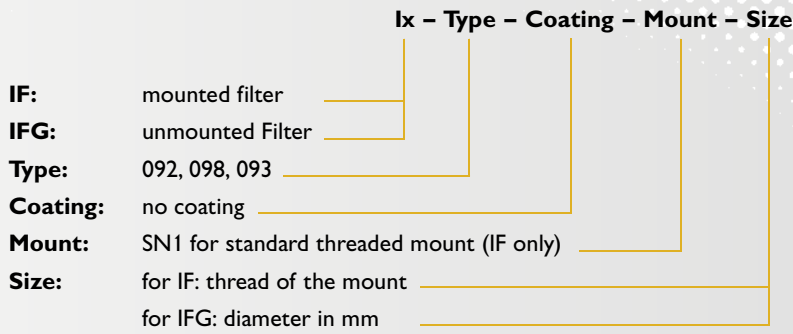
Filter Type:	092	098	093
Cut-on wavelength:	695 ± 10 nm	780 ± 10 nm	830 ± 10 nm
Surface:	5/2 × 0.16 <sup>2</sup>	5/2 × 0.16 <sup>2</sup>	5/2 × 0.16 <sup>2</sup>
Wavefront distortion <sup>3</sup> :	1 λ	1 λ	1 λ
Parallelism:	1 arc minute	1 arc minute	1 arc minute
Diameter tolerance:	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm
Thickness:	2.0 ± 0.3 mm	2.0 ± 0.3 mm	2.0 ± 0.3 mm

<sup>1</sup> Specifications for unmounted and uncoated versions

<sup>2</sup> Surface specification according to ISO 10110, quality usually similar to MIL 80-50 scratch-dig or better

<sup>3</sup> Per 30 mm at 633 nm

**ORDER INSTRUCTIONS:**



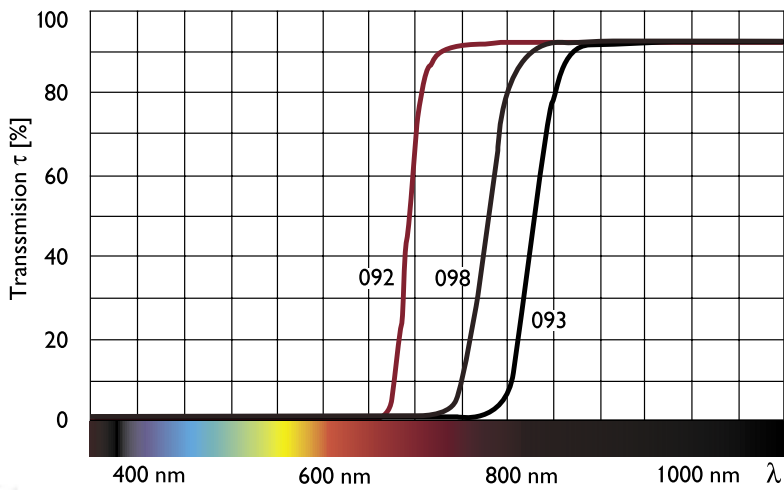
**Examples:**

IF – 098 – SN1 – 25.5

(mounted 098 filter with no coating for M25.5)

IFG – 093 – 30

(unmounted 093 filter with no coating, 30 mm diameter)



# INFRARED FILTERS

# Red & Yellow Filters



Call us for OEM versions

Red and yellow filters are long-pass filters that pass light at wavelengths longer than their characteristic cut-on wavelength – typically the wavelength at which the transmission is 50% of the maximum. These filters use absorptive glasses, that are robust, cost-effective and insensitive to angle of incidence. In machine vision, one of their typical applications, they

are used in front of a lens on a monochrome CCD or CMOS camera to improve image contrast. The appropriate type of filter has to be selected with respect to the color of the object and the type and/or color of the illumination. These filters are available unmounted or in mounts with all common thread sizes.

## Key Features

- Insensitive to angle of incidence
- Available in mounts with all common thread sizes
- Absence of vignetting due to large clear aperture

## Applications

- Machine Vision and other imaging applications
- Scientific & research measurements

Technical Specifications <sup>1</sup>								
Filter Type:	021	022	023	040	041	090	091	092
	light yellow	med. yellow	dark yellow	yell.-orange	red-orange	light red	red	dark red
Cut-on wavelength:	460 nm	490 nm	530 nm	550 nm	565 nm	600 nm	625 nm	695 nm
Cut-on wavelength tolerance:	± 10 nm	± 10 nm	± 10 nm	± 10 nm	± 10 nm	± 10 nm	± 10 nm	± 10 nm
Surface:	5/2 × 0.16 <sup>2</sup>	5/2 × 0.16 <sup>2</sup>	5/2 × 0.16 <sup>2</sup>	5/2 × 0.16 <sup>2</sup>	5/2 × 0.16 <sup>2</sup>	5/2 × 0.16 <sup>2</sup>	5/2 × 0.16 <sup>2</sup>	5/2 × 0.16 <sup>2</sup>
Wavefront distortion <sup>3</sup> :	1 λ	1 λ	1 λ	1 λ	1 λ	1 λ	1 λ	1 λ
Parallelism:	1 arc minute	1 arc minute	1 arc minute	1 arc minute	1 arc minute	1 arc minute	1 arc minute	1 arc minute
Diameter tolerance:	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm
Thickness:	2.0 ± 0.2 mm	2.0 ± 0.2 mm	2.0 ± 0.2 mm	2.0 ± 0.2 mm	2.0 ± 0.2 mm	2.0 ± 0.2 mm	2.0 ± 0.2 mm	2.0 ± 0.2 mm

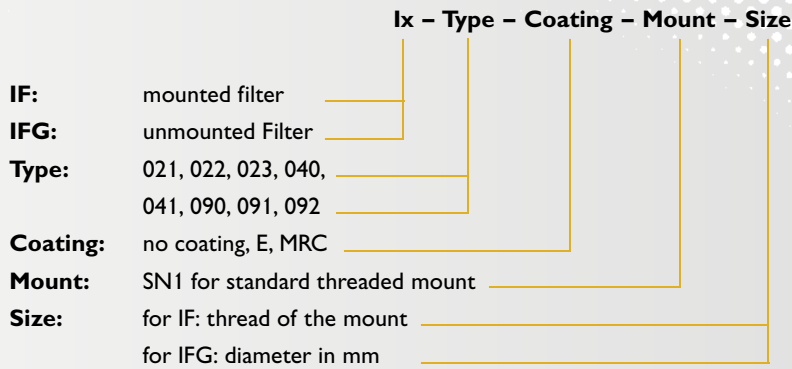
<sup>1</sup> Specifications for unmounted and uncoated versions

<sup>2</sup> Surface specification according to ISO 10110, quality usually similar to MIL 80-50 scratch-dig or better

<sup>3</sup> Per 30 mm at 633 nm



**ORDER INSTRUCTIONS:**



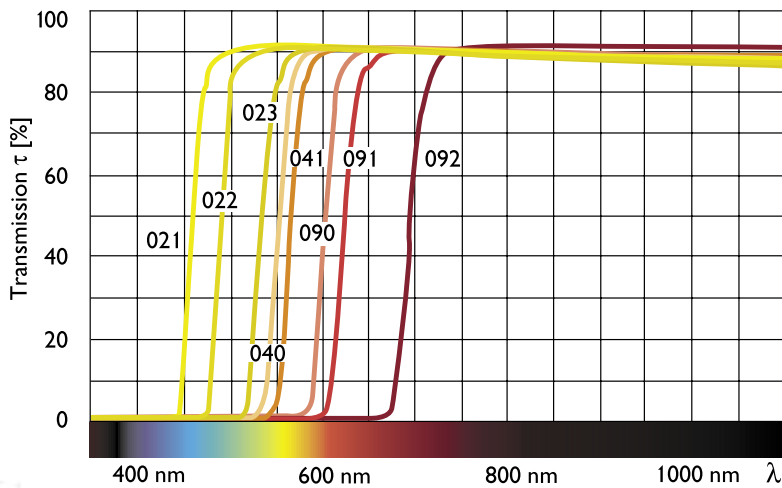
**Examples:**

IF - 090 - E - SN1 - 25.5

(090 filter with MgF<sub>2</sub> coating on both sides, mounted for M25.5)

IFG - 092 - 30

(unmounted 092 filter with no coating, 30 mm diameter)



# RED & YELLOW FILTERS

# Green & Blue Filters



Call us for OEM versions

Green and blue filters are band-pass filters with a specific spectral transmission characteristic that transmits light which is perceived by the human eye as the corresponding color. These filters use absorptive glasses, that are robust, cost-effective and insensitive to angle of incidence. In machine vision, one of their typical applications, they are used in front of a

lens on a monochrome CCD or CMOS camera to improve image contrast. The appropriate type of filter has to be selected with respect to the color of the object and the type and/or color of the illumination. These filters are available unmounted or in mounts with all common thread sizes.

## Key Features

- Insensitive to angle of incidence
- Available in mounts with all common thread sizes
- Absence of vignetting due to large clear aperture

## Applications

- Machine Vision and other imaging applications
- Scientific & research measurements

## Technical Specifications<sup>1</sup>

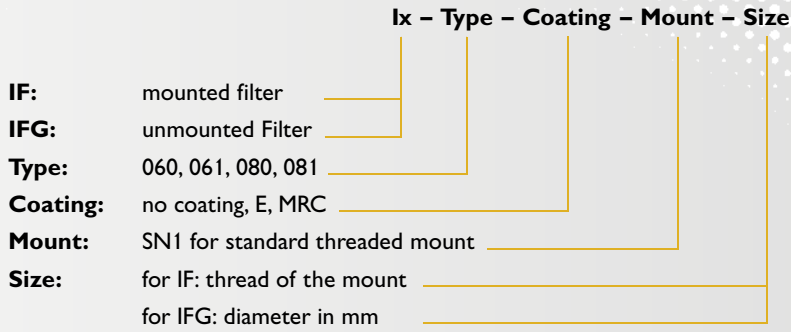
	060 Yellow-green	061 green	080 light blue	081 blue
Filter Type:	060 Yellow-green	061 green	080 light blue	081 blue
Surface:	5/2 x 0.16 <sup>2</sup>	5/2 x 0.16 <sup>2</sup>	5/2 x 0.16 <sup>2</sup>	5/2 x 0.16 <sup>2</sup>
Wavefront distortion <sup>3</sup> :	1 λ	1 λ	1 λ	1 λ
Parallelism:	1 arc minute	1 arc minute	1 arc minute	1 arc minute
Diameter tolerance:	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm
Thickness:	2.0 ± 0.2 mm	2.0 ± 0.2 mm	2.0 ± 0.2 mm	2.0 ± 0.2 mm

<sup>1</sup> Specifications for unmounted and uncoated versions

<sup>2</sup> Surface specification according to ISO 10110, quality usually similar to MIL 80-50 scratch-dig or better

<sup>3</sup> Per 30 mm at 633 nm

**ORDER INSTRUCTIONS:**



10  
11

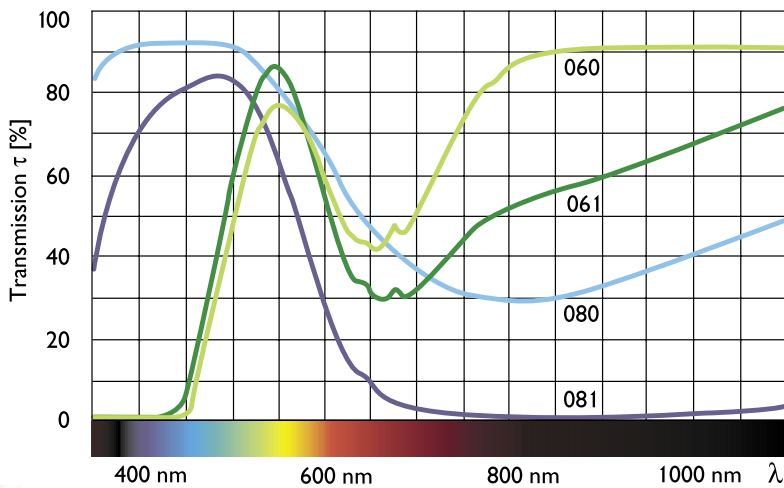
**Examples:**

IF – 060 – E – SN1 – 25.5

(060 filter with MgF<sub>2</sub> coating on both sides, mounted for M25.5)

IFG – 081 – 30

(unmounted 081 filter with no coating, 30 mm diameter)



# GREEN & BLUE FILTERS

# Neutral Density Filters



Call us for OEM versions

Schneider Kreuznach's neutral density filters attenuate light by absorption. By careful control of the thickness of the filter material there is a wide range of filters with different attenuation levels available. The transmission variations over the visible wavelength range are very small to avoid effects on color

balance. In imaging applications ND filters are used to adjust the intensity to an appropriate level to avoid camera overexposure. Using a filter instead of stopping down the iris of the lens leaves unaffected other imaging parameters such as depth of field and diffraction limitations.

## Key Features

- Low reflections
- Wide range of attenuation levels up to 1:1,000,000
- Combine filters to individual levels by stacking

## Applications

- Machine Vision and other imaging applications
- Scientific & research measurement

Technical Specifications <sup>1</sup>							
Filter Type:	101	102	103	106	110	113	120
Wavelength range:	visible	visible	visible	visible	visible	visible	visible
Optical density:	0.3	0.6	0.9	1.8	3.0	4.0	6.0
Transmission <sup>2</sup> :	50 %	25 %	12.5 %	1.6 %	0.1 %	0.01 %	0.0001 %
Surface:	5/2 x 0.16 <sup>3</sup>	5/2 x 0.16 <sup>3</sup>	5/2 x 0.16 <sup>3</sup>	5/2 x 0.16 <sup>3</sup>	5/2 x 0.16 <sup>3</sup>	5/2 x 0.16 <sup>3</sup>	5/2 x 0.16 <sup>3</sup>
Wavefront distortion <sup>4</sup> :	1 λ	1 λ	1 λ	1 λ	1 λ	1 λ	1 λ
Parallelism:	1 arc minute	1 arc minute	1 arc minute	1 arc minute	1 arc minute	1 arc minute	1 arc minute
Diameter tolerance:	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm	+ 0 - 0.3 mm
Thickness [mm]:	2.0 ± 0.1	2.3 ± 0.1	1.65 ± 0.1	1.8 ± 0.1	2.15 ± 0.1	1.7 ± 0.1	2.5 ± 0.1

<sup>1</sup> Specifications for unmounted and uncoated versions

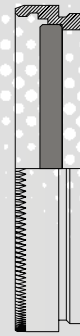
<sup>2</sup> Average over 400-700 nm

<sup>3</sup> Surface specification according to ISO 10110, quality usually similar to MIL 80-50 scratch-dig or better

<sup>4</sup> Per 30 mm at 633 nm

**ORDER INSTRUCTIONS:**

		Ix - Type - Coating - Mount - Size			
<b>IF:</b>	mounted filter	└──┘	└──┘	└──┘	└──┘
<b>IFG:</b>	unmounted Filter	└──┘	└──┘	└──┘	└──┘
<b>Type:</b>	101, 102, 103, 106, 110, 113, 120	└──┘	└──┘	└──┘	└──┘
<b>Coating:</b>	no coating, E, MRC	└──┘	└──┘	└──┘	└──┘
<b>Mount:</b>	SN1 for standard threaded mount (IF only)	└──┘	└──┘	└──┘	└──┘
<b>Size:</b>	for IF: thread of the mount for IFG: diameter in mm	└──┘	└──┘	└──┘	└──┘



12  
13

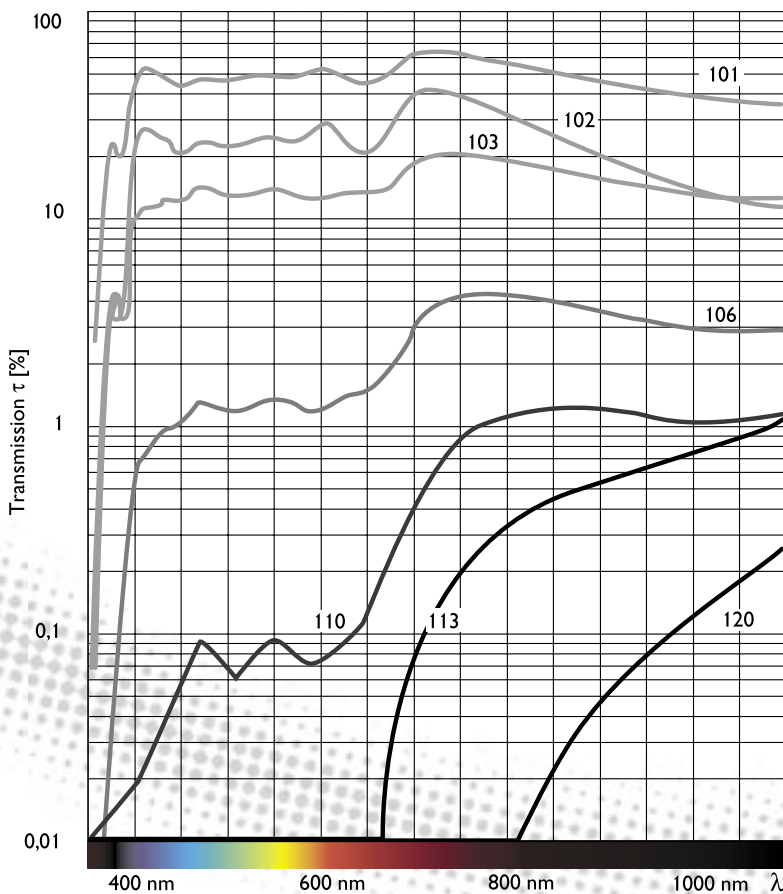
**Examples:**

IF - 101 - E - SN1 - 25.5

(101 filter with MgF<sub>2</sub> coating on both sides, mounted for M25.5)

IFG - 103 - 30

(unmounted 103 filter with with no coating, 30 mm diameter)



# NEUTRAL DENSITY FILTERS

# Polarization Filters



Call us for OEM versions

Schneider polarization filters are constructed with dichroic sheets of laminated polymers that are cemented between protective glasses. Natural light and many artificial light sources used for illumination emit unpolarized light or at least light with a low degree of polarization. If light goes through a linear polarizer it will afterwards be linearly polarized in the orientation of the polarization axis of the filter. When using a circular polarizer, light will be either left or right circular polarized. A circular polarizer consists of a linear polarizer combined with a  $\lambda/4$  element at an angle of  $45^\circ$ . If a pair of corresponding polarizers

is used (linear with linear or circular with circular), light passes when the orientation of their polarization axis is parallel. Light is blocked if the orientation is orthogonal to each other – this means for linear polarizers perpendicular polarization axes and for circular polarizer, left circular combined with right circular (or vice versa). In imaging applications, this effect is used to efficiently suppress reflections on dielectric or metallic surfaces because the reflected light is partially polarized (depending on material and reflective angle) and will be blocked if the filter is rotated in the appropriate orientation.

## Key Features

- Linear and circular versions
- High transmission
- Edge sealed versions

## Applications

- Machine Vision and other imaging applications
- 3D projection, microscopy
- Material testing (e.g. mechanical stress analysis by photoelasticity)
- Scientific & research measurements

## Technical Specifications<sup>1</sup>

Filter Type:	AUF Linear polarizer	AUC Circular polarizer <sup>2</sup>
Wavelength range:	380 nm – 780 nm	380 nm – 780 nm
Transmission <sup>3</sup>	30% (single), 20% (parallel pair)	30% (single), 20% (parallel pair)
Extinction ratio (crossed pair) <sup>3</sup>	10,000:1	4,000:1 <sup>4</sup>
Surface:	$5/2 \times 0.16^5$	$5/2 \times 0.16^5$
Wavefront distortion <sup>6</sup> :	$1 \lambda$	$1 \lambda$
Parallelism:	1 arc minute	1 arc minute
Diameter tolerance:	+ 0 - 0.3 mm	+ 0 - 0.3 mm
Thickness:	$2.6 \pm 0.2$ mm	$2.7 \pm 0.2$ mm

<sup>1</sup> Specifications for unmounted and uncoated versions

<sup>2</sup> Typically left circular

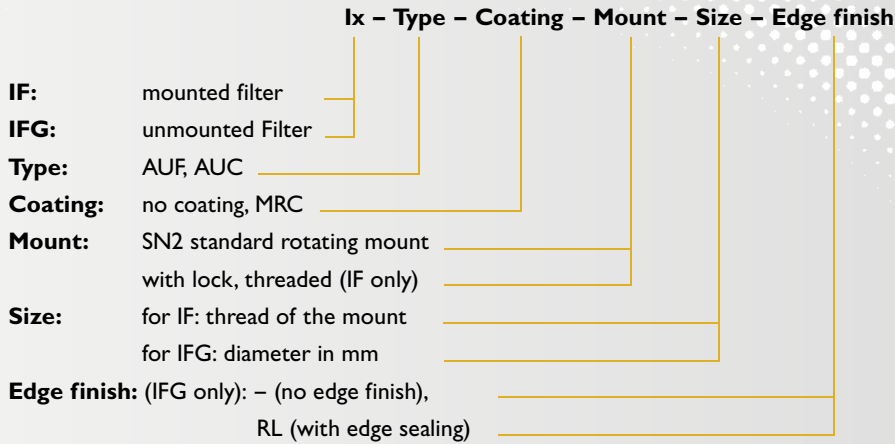
<sup>3</sup> Average over wavelength range for unpolarized light

<sup>4</sup> Measured with pair of left circular polarizers, linear sides pointing to each other

<sup>5</sup> Surface specification according to ISO 10110, quality usually similar to MIL 80-50 scratch-dig or better

<sup>6</sup> Per 30 mm at 633 nm

**ORDER INSTRUCTIONS:**



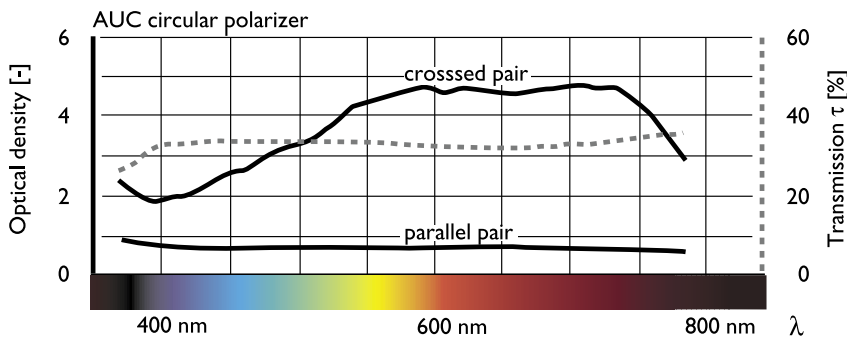
**Examples:**

IF - AUF - SN2 - 25.5

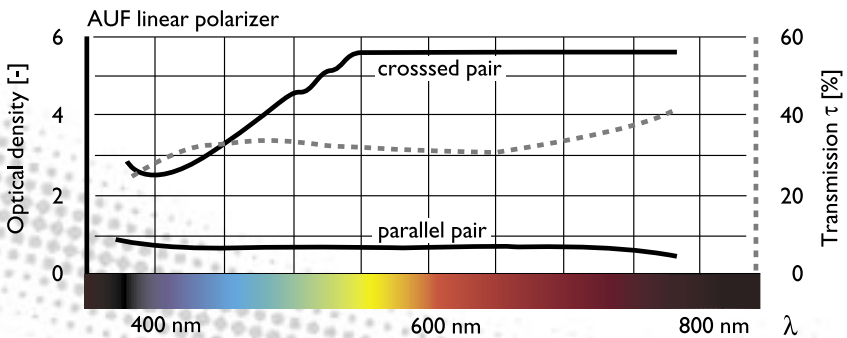
(AUF filter with no coating in rotating mount for M25.5)

IFG - AUC - MRC - 30 - RL

(unmounted filter AUC with MRC coating, 30 mm diameter, with edge sealing)



For industrial applications, a linear polarizer can often be used. If there are any mirrors between the filter and the sensor, circular polarizer are recommended (like for auto-exposure and auto-focus in SLR cameras). Since the polymer film is sensitive to humidity, we recommend the edge sealed version if the filter is not glued into a mount.



# POLARIZATION FILTERS

# Custom Filters



Call us for OEM versions

In terms of the spectral characteristics there are three basic types of filters: 1) Band pass filters (BP) that transmit light only around a certain center wavelength. 2) Long pass filters (LP) that transmit light with wavelengths longer than a certain cut-on wavelength. 3) Short pass filters (SP) that transmit light with wavelengths shorter than a certain cut-off wavelength.

Concerning the physical principle there are two basic types of filters: 1) Absorption filters which suppress the undesired part of the spectral energy by transforming it into heat in the bulk of the filter material. 2) Reflection filters which reflect the undesired part of the spectral energy back from the filter surface by interference (interference filters). The latter is realized by deposition of multiple thin layers of material

with certain thicknesses and refractive indices in several steps onto a glass substrate. The effective thickness of the thin layers and therefore the spectral characteristic of the filter depends on the angle of incidence of light.

By designing a specific thin film layer system, nearly any desired transmission characteristic can be achieved. By combining both principles, i.e. using an absorptive glass as substrate for the multiple thin layers, special spectral characteristics can be achieved.

For OEM volumes, we offer the design and manufacture of an appropriate filter per special requested transmission characteristic. Please use the parameters listed below to specify your requirements.

## Key Features

- Custom special transmission characteristic
- Available in mounts with all common thread sizes
- Absence of vignetting due to large clear aperture

## Applications

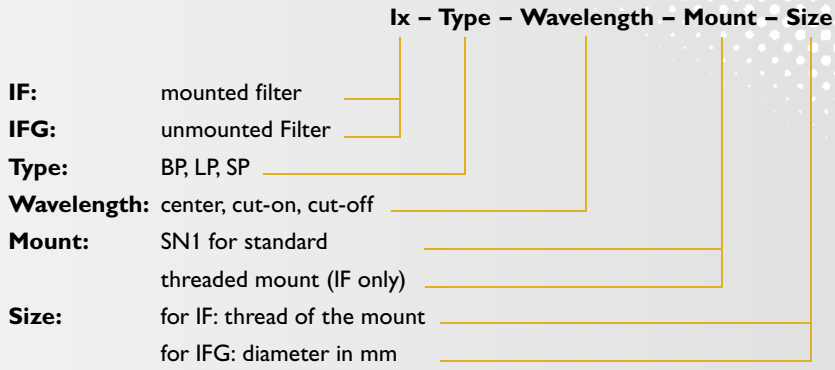
- Machine Vision and other imaging applications
- Bio analytics
- Scientific & research measurements

### Parameter for quote requests:

Filter Type:	BP Band pass	LP Long pass	SP Short pass
Wavelength:	Center wavelength	Cut-on wavelength	Cut-off wavelength
Transmittance range:	Bandwidth	max wavelength	min wavelength
Blocking range:	min/max	min wavelength	max wavelength
Transmission in pass range:	percent	percent	percent
Rejection in blocking range:	short/long side	short side	long side
Angle of incidence			



**ORDER INSTRUCTIONS:**



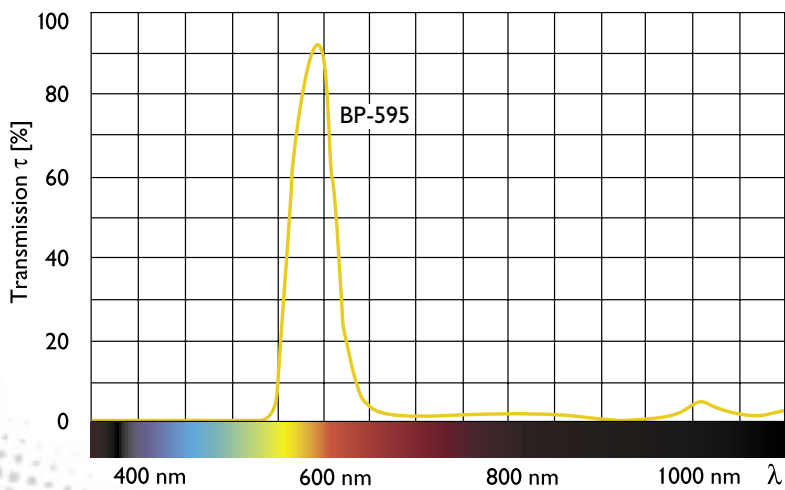
**Examples:**

IF – BP – 595 – SH – 58

(band pass filter for 595 nm in SH mount for M58x0.75)

IFG – SP – 690 – 30

(unmounted short pass filter with cut-off at 690 nm, 30 mm diameter)



# CUSTOM FILTERS

# Anti-reflection Coatings

## Call us for OEM versions

From any uncoated glass surface, about 4 to 9% of the light is reflected depending on the refractive index difference between air and the glass. The reflection of light not only causes a loss in intensity but also generates ghost images and stray light which reduce the image quality in an optical system. Schneider Kreuznach offers the choice of several different types of anti-reflection (AR) coatings that minimize the residual reflection per surface. All filters are available with no coating, with a standard single layer MgF<sub>2</sub> coating for the visible wavelength range, or with Schneider's superior Multi Resistant Coating

(MRC). This coating is a broadband multilayer AR coating for the visible wavelength range that is hydrophobic and features an extreme high resistance to mechanical and environmental stress. Since this process is 'cold' it can be applied to heat-sensitive materials such as plastic substrates or polarization filters based on polymer films cemented between protective glasses. In addition, custom specific special coatings are available, e.g. V-coatings that have extremely low residual reflectivity at the optimized wavelength.

## Key Features

- Standard AR coating based on MgF<sub>2</sub>
- Superior MRC coating, suitable also for heat-sensitive materials
- Custom V-coatings

## Applications

- High quality filters for imaging applications
- High performance lenses thanks to low stray light
- Optimization of optical imaging systems

## Technical Specifications

Coating Type:	E Single layer MgF <sub>2</sub>	MRC Broadband multilayer	V <sub>xxx</sub> V-coating
Wavelength range:	380 nm – 850 nm	400 nm – 680 nm	optimized at wavelength xxx
Residual reflectivity:	1.3 % <sup>1</sup>	0.5 % <sup>2</sup>	0.2 % <sup>3</sup>

<sup>1</sup> At  $\lambda=525$  nm, for refractive index of substrate  $n=1.52$

<sup>2</sup> For  $420$  nm  $< \lambda < 640$  nm; 1% for full range

<sup>3</sup> For optimized wavelength

**ORDER INSTRUCTIONS:**

**lx – Type – Coating – Mount – Size**

**IF:** mounted filter

**IFG:** unmounted Filter

**Type:** see datasheets for  
Schneider filters

**Coating:** E, MRC, Vxxx (specify optimized  
wavelength as xxx nm)

**Mount:** (IF only): see datasheet for mounts

**Size:** for IF: thread of the mount  
for IFG: diameter in mm

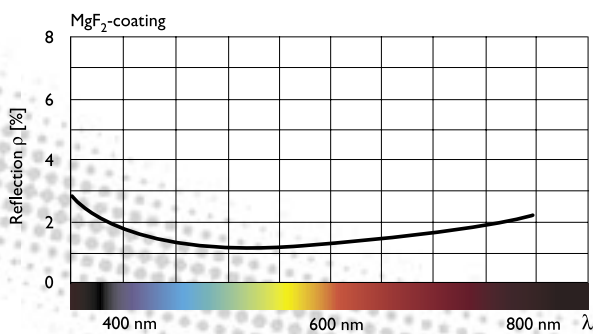
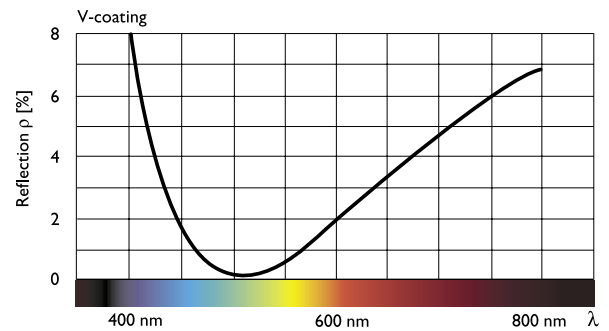
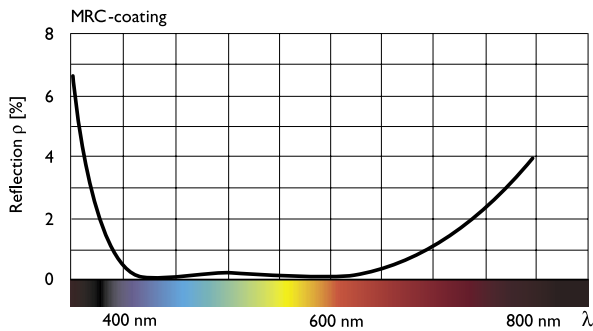


**Examples:**

IF – 010 – MRC – SN1 – 25.5 (Schneider filter 010 with MRC coating, mounted for M25.5)

IFG – 093 – V875 – 30 (unmounted Schneider filter 093 with V-coating optimized for 875 nm, 30 mm diameter)

Please ask us for coatings on any other substrate to be provided.



# ANTI-REFLECTION COATINGS

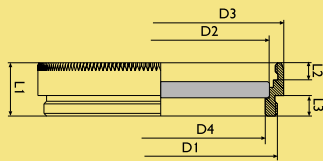
# Filter Mounts



Call us for OEM versions

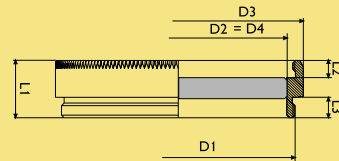
Often a filter is to be mounted on a camera lens that usually has an interface thread. Schneider Kreuznach's extensive variety of different filter mounts in all common sizes allow filters to be attached very conveniently. Depending on the type of mount, the filters are either glued into the mount or held in by a retaining ring. The new standard SN mount is

designed to have the maximum possible clear aperture, so that vignetting can be avoided. For polarization filters, there is a rotating version available – The new SN2 has even a locking mechanism to fix the correct orientation after adjustment. All threaded versions have identical male and female threads, so that they can be stacked.



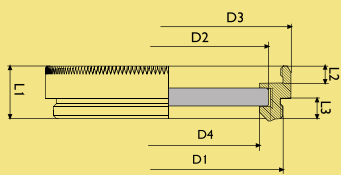
SN1 Mount: Filter thickness 1.0 - 4.0 mm

Thread (D1)	Filter Ø (D2)	Total Ø (D3)	Clear Ø (D4)	L1	L2	L3
M 25.5 X 0.50	23.5	27	22.5	6.5	2.1	2.5
M 27.0 X 0.50	25	28.5	24	6.5	2.1	2.5
M 28.5 X 0.50	26.5	30	25.5	6.5	2.1	2.5
M 30.5 X 0.50	28.5	32	27.5	6.5	2.1	2.5
M 34.0 X 0.50	32	35.5	31	6.5	2.1	2.5
M 35.5 X 0.50	33.5	37	32.5	6.5	2.1	2.5
M 39.0 X 0.50	37	40.5	36	6.5	2.1	2.5
M 40.5 X 0.50	38.5	42	37.5	6.5	2.1	2.5
M 43.0 X 0.75	41	44.5	40	6.5	2.1	2.5
M 46.0 X 0.75	44	47.5	43	6.5	2.1	2.5
M 49.0 X 0.75	47	50.5	46	6.5	2.1	2.5
M 52.0 X 0.75	50	53.5	49	6.5	2.1	2.5
M 58.0 X 0.75	56	59.5	55	6.5	2.1	2.5
M 62.0 X 0.75	60	63.5	59	6.5	2.1	2.5
M 67.0 X 0.75	65	68.5	64	6.5	2.1	2.5



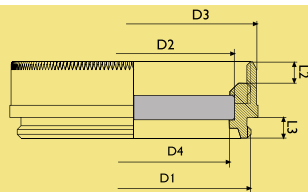
SN2 Rotating Mount: Filter thickness 1.0 - 4.5 mm

Thread (D1)	Filter Ø (D2)	Total Ø (D3)	Clear Ø (D4)	L1	L2	L3
M 25.5 X 0.50	23.5	27.5	23.5	7	2.1	2.5
M 27.0 X 0.50	25	29	25	7	2.1	2.5
M 28.5 X 0.50	26.5	30.5	26.5	7	2.1	2.5
M 30.5 X 0.50	28.5	32.5	28.5	7	2.1	2.5
M 34.0 X 0.50	32	36	32	7	2.1	2.5
M 35.5 X 0.50	33.5	37.5	33.5	7	2.1	2.5
M 39.0 X 0.50	37	41	37	7	2.1	2.5
M 40.5 X 0.50	38.5	42.5	38.5	7	2.1	2.5
M 43.0 X 0.75	41	45	41	7	2.1	2.5
M 46.0 X 0.75	44	48	44	7	2.1	2.5
M 49.0 X 0.75	47	51	47	7	2.1	2.5
M 52.0 X 0.75	50	54	50	7	2.1	2.5
M 58.0 X 0.75	56	60	56	7	2.1	2.5
M 62.0 X 0.75	60	64	60	7	2.1	2.5
M 67.0 X 0.75	65	69	65	7	2.1	2.5



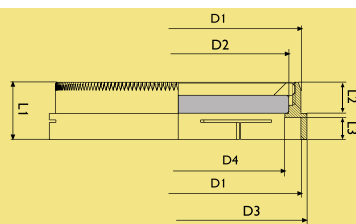
**SH Mount: Filter thickness 1.8 - 2.2 mm**

Thread (D1)	Filter Ø (D2)	Total Ø (D3)	Clear Ø (D4)	L1	L2	L3
M 19.0 X 0.50	16	21	13.8	6.4	2.5	2.1
M 24.0 X 0.50	21	25.5	18.8	6.4	2.5	2.1
M 25.5 X 0.50	23	27	20.8	6.4	2.5	2.1
M 27.0 X 0.50	24	28.5	21.8	6.4	2.5	2.1
M 27.0 X 0.75	24	28.5	21.8	6.9	2.5	2.6
M 28.0 X 0.75	25	30	22.8	6.9	2.5	2.6
M 28.5 X 0.50	26	30	23.8	6.4	2.5	2.1
M 30.5 X 0.50	28	32	25.8	6.4	2.5	2.1
M 34.0 X 0.50	31	36	28.8	6.4	2.5	2.1
M 35.0 X 0.50	32	37	29.8	6.4	2.5	2.1
M 35.5 X 0.50	33	37	30.8	6.4	2.5	2.1
M 37.0 X 0.50	34	39	31.8	6.4	2.5	2.1
M 37.0 X 0.75	34	39	31.8	6.9	2.5	2.6
M 37.5 X 0.50	35	39.5	32.8	6.4	2.5	2.1
M 38.0 X 0.75	35	39.5	32.8	6.9	2.5	2.6
M 39.0 X 0.50	36	40.5	33.8	6.4	2.5	2.1
M 40.0 X 0.50	37	42	34.8	6.4	2.5	2.1
M 40.5 X 0.50	38	42	35.8	6.4	2.5	2.1
M 41.0 X 0.50	38	43	35.8	6.4	2.5	2.1
M 43.0 X 0.50	40	45	37.8	6.4	2.5	2.1
M 43.0 X 0.75	40	45	37.8	6.9	2.5	2.6
M 46.0 X 0.75	43	48	40.8	6.9	2.5	2.6
M 48.0 X 0.75	45	50	42.8	6.9	2.5	2.6
M 49.0 X 0.75	46	51	43.8	6.9	2.5	2.6
M 52.0 X 0.75	49	54	46.8	6.9	2.5	2.6
M 55.0 X 0.75	52	57	49.8	6.9	2.5	2.6
M 58.0 X 0.75	55	60	52.8	6.9	2.5	2.6
M 60.0 X 0.75	57	61.8	54.8	6.9	2.5	2.6
M 62.0 X 0.75	59	64.5	56.8	6.9	2.5	2.6
M 67.0 X 0.75	64	69.5	61.8	6.9	2.5	2.6
M 72.0 X 0.75	69	74.5	66.8	6.9	2.5	2.6
M 77.0 X 0.75	74	79.5	71.8	6.9	2.5	2.6
M 82.0 X 0.75	79	84.5	76.8	6.9	2.5	2.6
M 86.0 X 1.00	83	89	80.8	8.7	3.4	3.5
M 95.0 X 1.00	92	97.2	89.8	8.7	3.4	3.5
M 105.0 X 1.00	102	108	99.8	8.7	3.4	3.5
M 112.0 X 1.50	107.5	114.5	105	12	5	5
M 122.0 X 1.00	116.5	124.5	113.5	8.7	3.4	3.5



**DH Mount: Filter thickness 2.2 - 4.5 mm**

Thread (D1)	Filter Ø (D2)	Total Ø (D3)	Clear Ø (D4)	L1	L2	L3
M 27.0 X 0.50	23	29	21.8	8.5	2	2.3
M 30.5 X 0.50	27	32.5	25.8	8.5	2	2.3
M 35.5 X 0.50	32	37.5	30.8	8.5	2	2.3
M 37.0 X 0.75	33	39	21.8	9.3	2.6	2.5
M 39.0 X 0.50	36	41	34.8	8.5	2	2.3
M 40.5 X 0.50	37	43	35.8	8.5	2	2.3
M 43.0 X 0.75	39	46	37.8	9.3	2.6	2.5
M 46.0 X 0.75	42	49	40.8	9.3	2.6	2.5
M 48.0 X 0.75	44	50	42.8	9.3	2.6	2.5
M 49.0 X 0.75	45	51	43.8	9.3	2.6	2.5
M 52.0 X 0.75	48	54	46.8	9.3	2.6	2.5
M 55.0 X 0.75	51	57	49.8	9.3	2.6	2.5
M 58.0 X 0.75	54	59.6	52.8	9.3	2.6	2.5
M 60.0 X 0.75	56	61.5	54.8	9.3	2.6	2.5
M 62.0 X 0.75	58	64	56.8	9.3	2.6	2.5
M 67.0 X 0.75	63	69	61.8	9.3	2.6	2.5
M 72.0 X 0.75	68	74	66.8	9.3	2.6	2.5
M 77.0 X 0.75	73	79	71.8	9.3	2.6	2.5
M 82.0 X 0.75	78	84	76.8	9.3	2.6	2.5
M 86.0 X 1.0	82	89	80.8	11.6	3.5	3.4
M 95.0 X 1.0	91	97	89.8	11.6	3.5	3.4
M 105.0 X 1.0	101	108.5	99.8	11.6	3.5	3.4
M 112.0 X 1.5	106	115.5	104.8	17.5	4.5	5.5
M 122.0 X 1.0	118	125.5	116.8	11.6	3.5	3.4

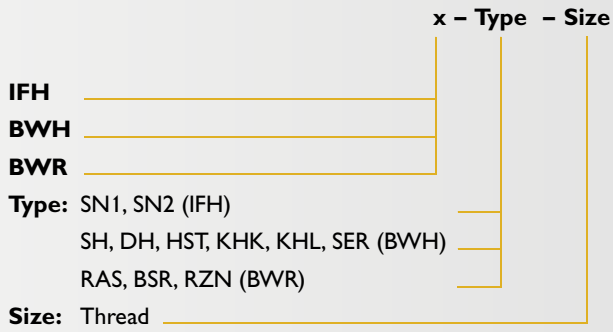


**HST Mount: Filter thickness 1.3 - 2.2 mm**

Push-on Ø (D1)	Filter Ø (D2)	Total Ø (D3)	Clear Ø (D4)	L1	L2	L3
28	25	29.5	24	7	3.5	2.7
30	27	31.5	26	7	3.5	2.7
31	28	32.5	27	7	3.5	2.7
32	29	33.5	28	7	3.5	2.7
33	30	34.5	29	7	3.5	2.7

# FILTER MOUNTS

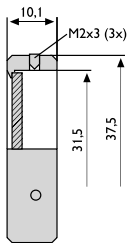
**ORDER INSTRUCTIONS:**



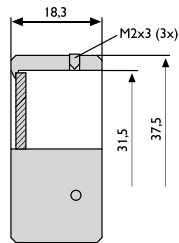
- SN1:** Standard mount with thread, filter glued in
- SN2:** Rotating standard mount with thread and locking mechanism, filter glued in
- SH:** Threaded mount, filter retained with ring RAS; **RAS:** Retaining ring for SH mount
- DH:** Rotating threaded mount, filter retained with ring BSR
- HST:** Push-on mount, filter retained with BSR
- BSR:** Retaining ring for DH and HST mount
- KHK, KHL:** Push-on mount with locking screws, filter glued in (for Schneider compact lenses)
- RZN:** Adapter rings for different thread sizes

**Examples:**

IFH SN1 30.5  
 (standard mount SN1 for M30.5)  
 BWH SH 25.5 (SH mount for M25.5)  
 BWR RAS 24 (retaining ring RAS for BWH SH 25.5)



**KHK**



**KHL**

# FILTER MOUNTS

# Custom specific products:

## Custom specific products:

In addition to products listed in this catalog, we do offer other special products at the customers request. Please feel free to contact us about details concerning:

- Polarizing Films
- Retardation Films
- Quarter-Wave Plates
- Full Wave Plates/Red I Filters
- Special cementations
- Close-up Lenses
- Color Correction Filters
- Adapters
- Lens Caps
- Mounting Tools

## Our commitment to the industrial markets:

- Our target segments include:
- Surface & web inspection
  - ITS and traffic law enforcement systems
  - Document reading
  - Mail identification and sorting
  - Metrology, 2D/3D

## Besides filters, we offer a broad variety of lenses:

- Compact C-mount lenses
- Bilateral telecentric lenses
- Modular macro system
- Lenses for large sensors
- 3-CCD lenses



Jos. Schneider Optische Werke GmbH  
Ringstr. 132  
55543 Bad Kreuznach  
Germany  
Phone: +49-(0)671-601-490  
Fax: +49-(0)671-601-286  
[www.schneiderkreuznach.com/industrialoptics](http://www.schneiderkreuznach.com/industrialoptics)  
[industrie@schneiderkreuznach.com](mailto:industrie@schneiderkreuznach.com)

Schneider Optics Inc.  
285 Oser Ave  
Hauppauge, NY 11788  
USA  
Phone: +1 631-761 5000  
Fax: +1 631-761 5090  
[www.schneideroptics.com/oem](http://www.schneideroptics.com/oem)  
[oem@schneideroptics.com](mailto:oem@schneideroptics.com)