Filters Buying Guide

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Introduction

...what are filters?

You own the perfect lens and create stunning images, is it possible to make those pictures even more wonderful? The answer is in filters. Filters are accessories that are added to the front of your lens that emphasize, eliminate, or change the colour density of the image. Typically made out of glass, resin, or polyester, the transparency of the material allows for correction of light or colour balance. Want a special effect? Many filters are designed to add bursts of colour, soften edges and make light sources sparkle.

Cyan Filter Courtesy of Cokin

Attaching these filters is easy and quick, there are two styles available in the market. Screw in or threaded round filters are glass or plastic disks with a metal or plastic threaded ring frame. These are simply screwed in to the front of your lens. Available in different sizes, most filters types will be available in your lens size. Compact and ultra portable, these screw in filters are slim in design and can be stored easily. A common disadvantage of this type of filter is that you will need to purchase several filters for every lens size you carry and in every filter type you require.

Screw In Filters »

Drop in filters come in square or rectangular shape and a filter mount is required for it to be used with the lens. Although bulkier than the screw in variety, you will only need to purchase one mount per lens size and one of each filter type you require as they are interchangable between mounts.
Drop In Filters »

Understanding the different types of filters will allow you to manipulate, correct colour, add effects, and enhance your images prior to print. So the big question is, why don't you just add these effects in editing software like Photoshop afterwards? Although it is possible to colour correct and add special effects to your images after shooting, it takes much more time to do this then using a filter in the first place. There are even some corrections that are done through a filter that are nearly impossible to replicate in digital software applications.
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Construction

...how are filters made?

Glass

The main component of a screw-in filter is the glass construction. The price range can vary depending on the process to which the filters are produced and is unique to each manufacturer.

Filters can be constructed out of regular glass that sandwiches a coloured gel inbetween. This lamination process fuses the three pieces together and is cut and ground to specific filter sizes. The disadvantage is that the layers may separate over time causing bubbles and imperfections. And because there is so many layers involved, all 6 surfaces of the materials need to be perfectly flat or else the image quality can be reduced. Over time, the gel inbetween the glass can also fade.

Higher end filters use a completely different process. Raw elements are added to the molten optical glass so there is no risk of uneven colour. This molten optical glass is higher quality than regular glass and is ground and polished for a perfectly flat surface. Coatings can be added to both or a single side of the filter to reduce reflections and a protective top coat is sometimes applied to prevent scratches.

Filter Frame

The ring that holds the filter and attaches to the lens is made of brass or aluminum. Brass is a harder metal that is not easily bendable making it nearly impossible for it to become binded to the lens if it suffers from an impact. Although very durable, the hardness could be a disadvantage as any impact of the filter could transfer to the actually lens itself and damage it rather than the filter.

Aluminum is another popular material for the filter frame. It is softer than brass, thus will bend and distort if impacted hard enough. This could save your lens, since the aluminum frame will absorb the impact and possibly break the glass filter instead of the lens. The downside is that the broken glass may damage the lens or the filter frame will fuse to the lens requiring a special tool to detach it.

The metal filter frames are usually black in colour to reduce reflection and minimize distortion.

Filter Types

... what can filters do to enhance your image?

Clear
Technically this is not a filter since it doesn't do anything to change the light or colour but it does provide some essential benefits. Using a clear filter on your lens will help protect it from scratches, fingerprints, and dust. If by chance you happen to drop the lens, the filter should offer the camera lens some measure of protection. For an inexpensive piece of glass, you could be saving a lot of repair costs.
Clear Filters »

UV or Ultra-Violet
One step up from the clear filter is the UV or Ultra-Violet filter. While ultraviolet light is invisible to the human eye, it can nevertheless show up on a film or digital image as an undesirable blueish cast; it can even result in a blurring effect. Often used as a means of protection for the lens, these filters can be left on at all times as it is completely clear and will not change the colour or density of light. Ideal for photography of expansive spaces like mountains and sweeping landscapes.
UV Filters »
UV Haze Filters »

Neutral Density (ND)
A popular filter for outdoor photography, these filters are neutral gray and reduce the amount of light passing through the lens. Used to prevent overexposure or washed out images when the light is too bright or the ISO is too high; it also allows you to lower the intensity of light so you can shoot at a slower shutter speed and achieve a blurring affect. Not only does it correct exposure but at a wider aperture it reduces depth of field enabling the foreground to maintain sharpness and blurs the background for a pleasing effect.

Often refered to as "ND" filters, neutral density filters are available in varying densities allowing you to control your filtering depending on the light conditions.
Neutral Density »

Colour Conversion or Correction
All film has a colour balance (or temperature) to suit a particular set of lighting conditions. Daylight film is designed to yield correct colour for photographs taken under daylight conditions. Tungsten film is designed to yield correct colour under warmer tungsten light – the light of ordinary household light bulbs. Sometimes you may not have the right film in your camera for the lighting conditions you're shooting in. That's where colour correction filters come in.

L. Sierpe

They can eliminate unwanted colour casts and ensure your image renders colour accurately. Colour correction or conversion filters belong to two groups; orange and blue. The orange CC filters "warm up" scenes that were too blue, and the blue CC filters "cool down" the scenes that were too orange or red. Each filter in each group varies in strength; they're very precise in how much they shift colour. This colour cast and strength is expressed in degrees Kelvin. For example, the daylight balance or colour temperature of daylight film is 5200 degrees Kelvin. (The higher the number, the bluer the colour, the lower the number, the warmer.) Currently colour conversion or correction filters are used predominately on cameras that use film.

They also can be used on digital cameras that have automatic white balance and no manual option. Digital cameras with manual colour temperature selection can be set internally to match the colour of the scene and thus no external colour correction filters are required.

Cooling Conversion »
Warming Conversion »

Colour Compensating

These filters are cyan, magenta and yellow in colour and they absorb different amounts of the red, green and blue parts of the light spectrum. As a result, they correct deficiencies in the colour quantity of light sources. They also reduce unwanted rays or intrusive reflections.

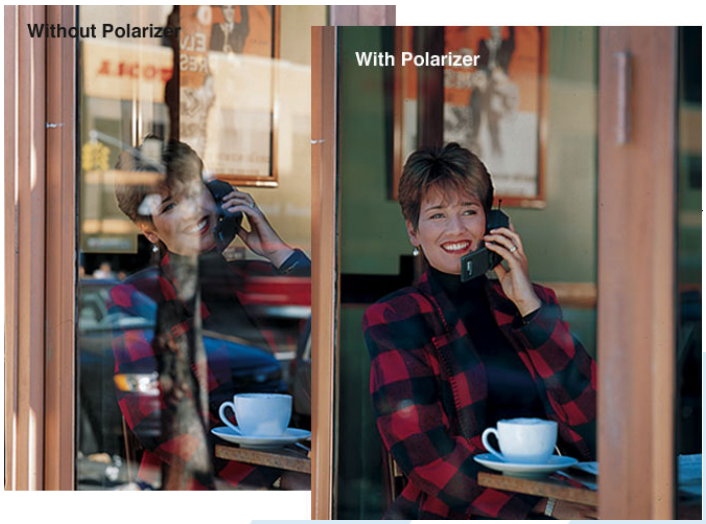
Colour Compensating »

Polarizing

Reflections of water and other reflective surfaces, like glass, can cause major problems for your images. Polarizing or polarizer filters can fix them because they remove glare from non-metallic surfaces, ensuring a crisp, clear, more colour saturated image.

Reflected light can also wash out an image, but polarizing filters combat this nicely by producing deeper colour saturation.

Ideal for outdoor photography, a polarizing filter can be rotated for desired effects and the results will produce dramatic blue skies and better contrast and colour.



Polarizers comes in two types: circular and linear. Circular polarizers are used predominantly in auto focus SLRs so as not to interfere with the exposure metering and auto focus system.

Polarizing Filter »
Circular Polarizing Filter »

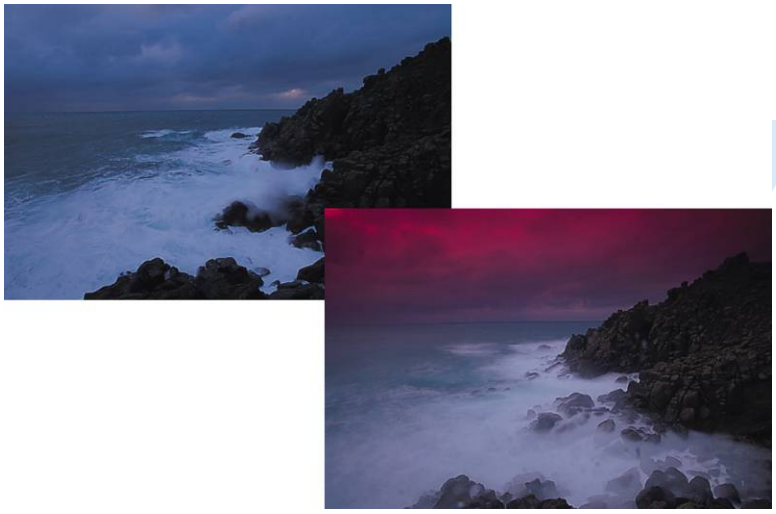
Diffusion

A classic filter used for portraits or subjects that require a dreamy or haze appearance. Diffusion filters reduce contrast and softens the image in varying degrees depending on the manufacturer's type. Also known as a softening filter, the more subtle varieties are ideal for portraits as it softens imperfections from skin without blurring out features like the eyes.
Diffuser Filters »

Graduated Filters

What happens if the image you are capturing only needs a filter on only one part of the scene? Graduated filters are half clear and half coloured allowing you to position the filter so that only a part of your image is affected.

They are available in neutral density and colour varieties in screw in or drop in filters. Drop in filters are typically a little bit longer in size so you can position the transition of the filter in a specific spot. The transition between the coloured half and the clear half can be soft or hard.
Neutral Density Graduated Filters »
Coloured Graduated Filters »



Star Effects
To add dazzle and glamour to your night scenes, star effect filters take points of bright light and turns them into star shapes. These shapes streak from the source of light and the brighter it is, the more enhanced it becomes. Some of these filters can be rotated giving you complete control over your creativity.
Star Filters »

Stepping Rings
Common accessories for screw in round filters are step up or step down rings. These ring adapters allows you to use a filter size that does not match the size of your lens. For example if you have 52mm lens and want to purchase a 67mm filter, you could use a 52mm-67mm step up ring to accommodate the difference. This same idea applies to step down rings but in reverse. Stepping rings allow you to use on filter on two different-sized lenses and avoid the need to buy a separate set of filters for every size of lens you own.
Stepping Rings »

MANUFACTURERS

... what kind of systems are there?
Each manufacturer designs different systems for their drop in filter lines. Different mounts allow you to use multiple filters in conjunction with each other and many other features make your lens more adaptable to their system.

Although some features may be unique to each manufacturer, the generic size of filter systems are 4”x4” (100mmx100mm) and 4”x6” (100mmx150mm). The 4”x6” are designed for graduated filters so you have more control of where the gradation falls in your image. Other sizes are available for smaller lenses like 75mmx75mm.

The design of the filter holders are fairly similar, typically there is a mount that holds the filters in the front of the lens. Some holders have multiple slots so you can use a combination of filters at the same time. These can be permanently attached as one unit or customizable. Keep in mind that the more filters you add the less your angle of view will become.

Specific companies that produce drop-in filters like B+W, Hoya, Lee Filters, Cokin, and Tiffen manufactures a wide range of 4”x4” and 4”x6” filters to accommodate these universal filter holders.

These companies also produce screw-in filters in a multitude of sizes and types.

Instead of using ordinary window glass, B+W uses Schott German optical glass from which the filters are diamond cut, precision ground, and then polished to ensure flatness on both surfaces and a uniform thickness throughout. Each filter is interferometrically tested for plane parallelism which is the same process that is routinely used by the world's leading lens makers.

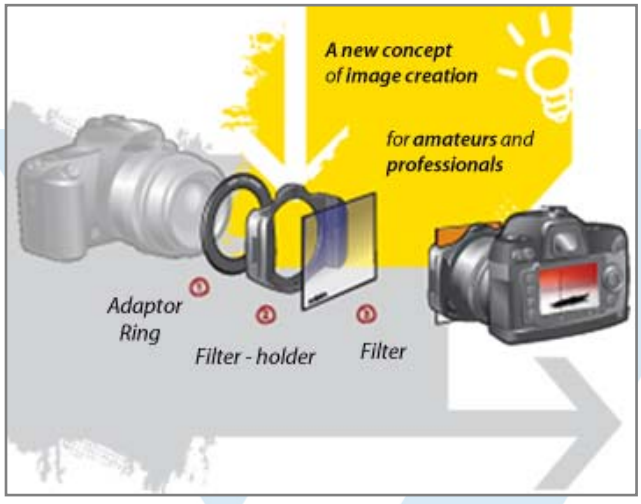
B+W has also developed a line of filters that have a Multi Resistant Coating (MRC) that eliminates surface reflections on both sides of the filter. This maximizes light transmission and offers an extraordinary hardness that minimizes scratching and facilitates cleaning as it is water and dirt repelling.

The filter frames on B+W filters are made out of a black, corrosion-free brass ring that also reduces surface reflections and minimizes distortion or binding of filter to the lens. All filters must pass manual as well as automated tests to insure that each and every one that leaves the factory meets B&W's critical standards.
B+W Filters »

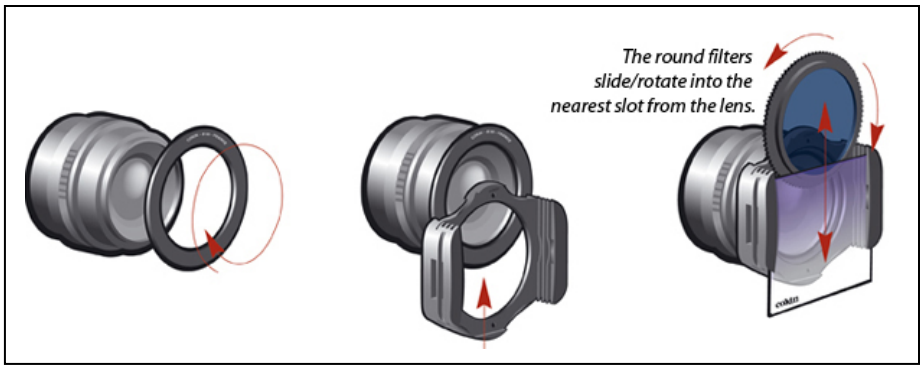
Cokin manufactures a wide range of screw-in and drop-in filters. To maximize the creative potential of the drop-in filters, Cokin offers its Creative Filter System. It consists of three easy-to-assemble components that allow you to use Cokin's full range of correction and effects filters. The components are (i) the adapter ring (ii) the filter holder and (iii) and the filter itself.

The adapter ring attaches directly to your camera and the holder slips and locks onto this ring. The filter is then slipped into the appropriate slot on the holder. Naturally, this system allows you to use the same filter on a variety of lenses instead of purchasing individual filters to fit each lens size.

Designed for amateur and professional cameras, the Cokin Creative Filter System includes numerous accessories to make filter use extra-convenient for the photographer.



A total of four series of filter systems are available: the A Series, P Series, Z-PRO Series, and X-PRO Series. Each system is of similar design; the only difference is their size, which is related to the size of lens they will be used on.



A Series
This series is meant for lenses with a focal length of 35mm and higher and a diameter of up to 62mm. A Series filters are 67mm wide.

The following ring adapters are available for the A Series:
36mm
37mm
39mm
40.5mm
41mm
42mm
43mm
43.5mm
44mm
46mm
48mm
49mm
52mm
54mm
55mm
58mm
62mm
Hasselblad B50

A Series Products »

P Series

This series is meant for lenses with a focal length of 20, 24mm or 28mm, as well as wide angle zooms (24-50mm, 28-85mm, 35-135mm). The P Series is recommended for lenses that have a diameter of up to 82mm. Filters in this series are 84mm wide.

The P filter holder is the ideal filter holder for avoiding vignetting on 35mm format lenses. Up to three filters can be used to create a unique effect.

The following ring adapters are available for the P Series:
48mm
49mm
52mm
55mm
58mm
62mm
67mm
72mm
77mm
82mm
Hasselblad B50
Hasselblad B60
Hasselblad B70
Rollei VI
Universal Ring

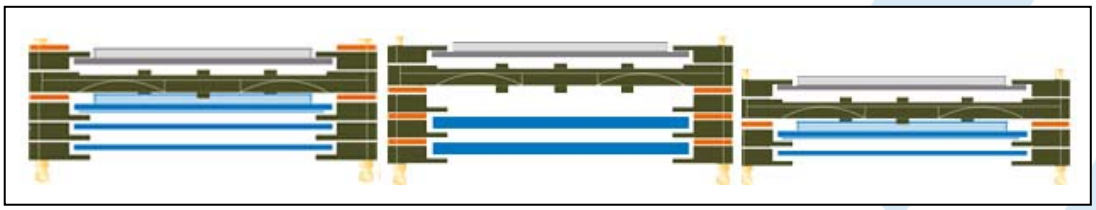
P Series Products »

Z-PRO Series

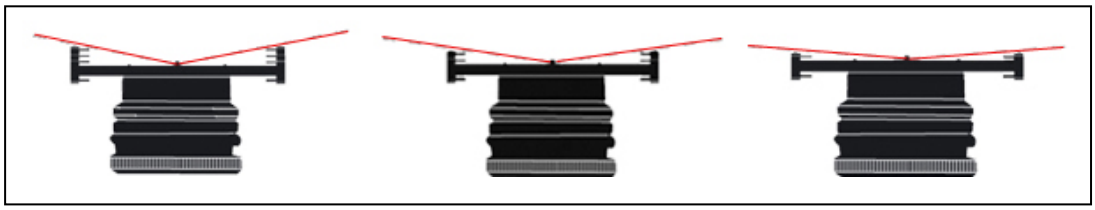
This series is specially designed for the larger diameter lenses found on medium format cameras as well as wide-angle lenses in general. It is the recommended choice for 35mm camera lenses with focal lengths of 20mm or larger. This Series is also used on video/broadcast cameras. The Z-PRO Series system is adaptable to all lens sizes up to 96mm in diameter, and its filters come in two different sizes: a standard size of 100 x 100mm and a graduated filter size of 100 x 150mm.

The Z-PRO filter holder is designed to fit both film and digital cameras, including DSLRs and medium format cameras. As mentioned above, it's also designed to fit semi-professional and professional video/broadcast cameras, right up to the new HD models.

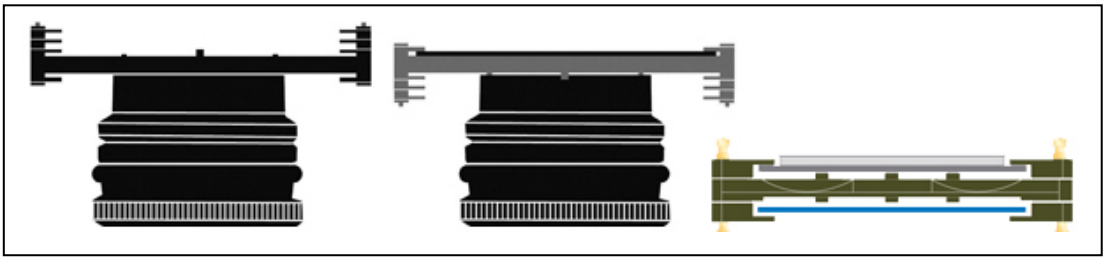
This system is totally modular; the Z-PRO filter holder can be easily dismantled and reconfigured. Cokin has integrated a new Spacer System (in orange in the drawings) into the holder which accepts filters in all popular dimensions.



In order to accommodate extra wide-angle lenses, the Z-PRO Filter-Holder can be dismantled, allowing the removal of several filter slots. This procedure removes all unused slots from the field of view and protects against the risk of vignetting.



There is another way to prevent all risks of vignetting without dismantling it and therefore gaining time. The Z-PRO Series filter holder is fully reversible, meaning that a filter that fit in the adaptor ring's slot and the adaptor ring can be placed in the first filter slot. Therefore the filter can be positioned very close to the lens and the edges of the holder are no longer obstacle in the field of use.



COKIN's Z-PRO System is totally compatible with the following 100mm (4") systems: Lee Filters®, Tiffen®, and B+W®.

The following ring adapters are available for the Z-PRO Series:
49mm
52mm
55mm
58mm
62mm
67mm
72mm
77mm
82mm
86mm (0.75 thread)
86mm (1.00 thread)
95mm (1.00 thread)
96mm (1.00 thread)
Hasselblad B60
Hasselblad B70
Rollei VI

Z-PRO Series Products »

X-PRO Series

With a 170mm x 130mm filter size, the Cokin X-PRO series has been created to offer the professional photographer a comprehensive range of filters that can be used on medium and large format camera systems, as well as extreme wide angle lenses used by photographers, videographers and broadcasters.

Holders: made of lightweight material, the holder has an exclusive Ring Locker System. Developed by Cokin, the system ensures that the holder can be secured in a certain position and that the filter is kept parallel to the lens. If the photographer requires the filter to be rotated, this can also be achieved.

Adapter rings: available in sizes from 62mm to 112mm and will fit diameters of lenses up to 118mm with a 4-point universal ring. Aimed at the professional and enthusiast photographer, the X-PRO series total over 80 different filters (84mm wide) including coloured, centre spots, pastel/ diffusers to graduated and neutral density filters.

The following ring adapters are available for the X-Pro Series:
62mm
67mm
77mm
82mm
86mm (0.75 thread)
86mm (1.00 thread)
95mm (1.00 thread)
96mm (1.00 thread)
105mm (0.75mm thread)
105mm (1.00 thread)
112mm (0.75mm thread)
112mm (1.00mm thread)
112mm (1.50mm thread)
Hasselblad B60
Hasselblad B70
Rollei VI
Universal Ring

X-PRO Series Products »

LEE Filters

The Lee Drop-in Filter Holder System is versatile and easy to use. It is designed for 35mm, medium format, large format or even extreme wide-angle lenses.

The key to this system's versatility is an adapter ring that screws onto the front of the lens.. Once the appropriate size adapter is fitted, the rest of the system clips neatly and easily into place. A filter holder with removable guides enables you to decide which combination of filters – starting with gels up to 4mm in thickness – would be most suitable for your needs. In addition, the holder rotates so you can make the most of the selected filter's effects. This capability can be enhanced when two or more holders are fitted together to accept additional filters.

For added convenience, the holder easily clips on and off a lens. The system also features a unique, lightweight lens hood which operates without requiring rails or guides.
Lee Filters »

Hoya manufactures a full line of filters in both standard and multi-coated varieties. Their standard filters have one layer of anti-reflective coating applied to each surface of the glass. The multi-coated line features a three layer coating that further reduces light reflections and is bonded to the glass in a furnace at a temperature of up to 800°F. Hoya's Super Multi-coated filters have 5 layers of anti-reflective coating and a transparent easy-clean top coat.

To enhance the quality of their colour filters, Hoya adds different raw elements, like gold, and chemicals to the optical glass while it is still in a molten state. This insures that filter glass is uniformly coloured all the way through. So there is never any risk of uneven colouration, shifting or fading of the colour, or delamination. Finally, the two surfaces are ground and polished for perfect flatness.
Hoya »

Tiffen filters are manufactured using ColorCore™ technology, a closely guarded proprietary process that entails permanently laminating the filter material in between two pieces of optical glass. Once the lamination process is completed, the optical glass is ground flat to tolerances of one ten-thousandth of an inch, then mounted in precision metal rings.

The ColorCore process allows Tiffen to control the colour and density of their filters, as well as the characteristics of their special effects filters. When Tiffen filters are ground and polished, the ColorCore is unaffected, so colour and density remain uniform.

Tiffen also carries an abundant amount of special effects filters like star, fog, and smoke filters.
Tiffen »