

B+W Filter

The whole world of filters for creative photography. Made in Germany



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B+W Filter

The passion for optics,
with precision, quality
and longevity.

High tech made in Germany

since 1947.

Innovation and experience "Made in Germany"

For more than 65 years, B+W filters have been synonymous with quality and innovation. Following the merger with Jos. Schneider Optische Werke GmbH in 1985, the company moved into its current premises in Bad Kreuznach. Under the umbrella of Schneider-Kreuznach a lively technology transfer developed. B+W has succeeded in establishing itself as one of the world's leading filter manufacturers. It has, for example, made decisive progress in surface coating. B+W is the first filter manufacturer in the world to offer MRC (Multi Resistant Coating). MRC nano-coating is the most innovative development in thin-layer technology. The world-famous Käsemann-type polarizing filter with its outstanding quality has been produced by B+W since 1989. Today, state-of-the-art production equipment, precise CNC machines and highly advanced reflection-reducing technology guarantee top quality which is amongst the very best to be found on the world market.

When it comes to technology products, a 65-year company history is corroboration of recognized top quality. Comprehensive know-how and state-of-the-art production technology have made a name for the proverbial B+W filter quality of Schneider-Kreuznach throughout the world. B+W filters also perform creative tasks in digital photography. Improving photographic results without touching the data record can only be done with first-class filters. The name B+W guarantees perfect image quality.



**Perfection for the light, all the best for the picture.
For example with surface coating technology:
single layer, MRC and MRC nano.
Trust is good, control is better:**

B+W filters

B+W filters for better quality in digital photos

Particularly in digital photography, B+W filters are important tools for improving image quality. A B+W polarizing filter, for example, provides more saturated colors and higher color contrasts because the bluish-gray haze typical of sunny days is filtered before the image sensor generates the data record. If UV or IR radiation causes haze or blur a UV/IR blocking filter in front of the lens can ensure more brilliance and detail sharpness without the necessity for coarsening resharping in the image program. Filters solve problems before they occur in the image sensor.

Image-processing programs, on the other hand, cannot conjure up information which is not contained in the data record. Many of the most commonly used color and contrast corrections work by removing image information (destructive image correction). Such, in some cases coarse repairs leave considerable gaps in the data record which are not yet recognizable on the PC monitor, but can become visible on the higher-resolution print.

Safety through high-tech production

B+W is the first filter manufacturer in the world to offer MRC (Multi Resistant Coating). This multi-layer coating is vapor-deposited in highly advanced vacuum coating plants. It is extremely low-reflective and highly resistant to scratching. But above all its unique dirt and water-repellent surface makes cleaning the filters easier. In this way, filters can also perform a protective function for the front lens.

Top performance thanks to Multi Resistant Coating (MRC)

A key criterion for an outstanding filter is the coating. Quality begins in front of the lens, and that is, of course, where the filter is placed. A filter must not impair the performance of the optics. MRC (Multi Resistant Coating) have a multicoating layer on both sides (7 + 1 on each) which ensures maximum reflection reduction and thereby eliminates disruptive stray light. In this way, more brilliant colors and higher contrasts can be attained. Due to the low residual reflection (0.5%) MRC reliably prevents ghost or multiple images which can be caused by back reflection from the image sensor.

Furthermore, MRC protects the filter from scratching with increased layer hardness, thereby preserving the high optical quality. In addition, MRC is dirt and water repellent, which makes cleaning easier.

The MRC nano coating – all XS-Pro Digital filters have it. The outer layer of MRC nano has been strengthened in its effectiveness. The nanotechnology-based characteristic (lotus effect) produces a better beading effect in water. This makes cleaning the filter surface even simpler and faster. The hydrophobic surface reduces fogging. During the transition from a cold to a warm environment, the fogging on the filter glass surface dissipates within a very short time.



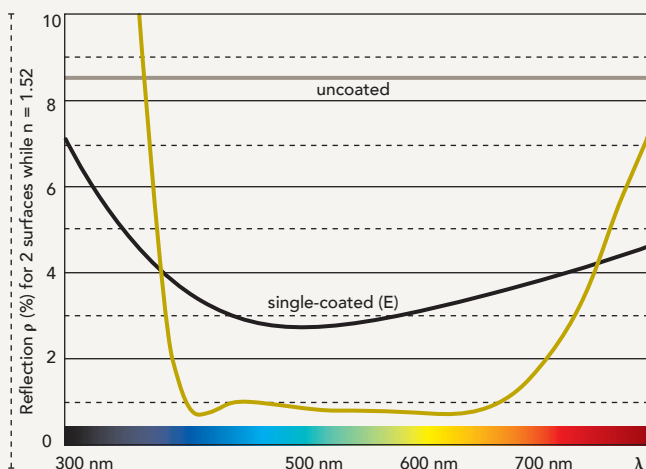
On an uncoated filter or a filter with standard coating (E) the water drop remains flat. There is no dirt- or water-repellent effect.



On a filter coated with hydrophobic material (MRC) the water drop is noticeably flatter. It beads off the surface. There is a dirt- and water-repellent effect.



On a filter coated with super-hydrophobic material (MRC nano) a water drop remains practically spherical. It rolls off the surface. There is an outstanding dirt- and water-repellent effect.



B+W Filter – quality without edges for optical *perfection* Threaded filter mounts.

B+W quality: A brand that keeps its promise

The quality of high-grade filters is determined by various criteria. Many photographers are aware that the plane parallelism and transmission properties of glass and the coating are key factors for image quality. What fewer of them know is that the filter mount must also meet high requirements as a link in the high-tech chain. The main purpose of the mount is to hold the fragile filter glass in place, firmly yet without play, for a long time. However, the glass must not be subjected to mechanical tension because even the tiniest deformations can result in visible unsharpness. Nevertheless, the filter must also be able to withstand a strong grip. And even after frequent use it must ensure easy and precise attachment and removal. A non-slip surface quality makes handling easier. The mount thickness should be kept to a minimum in order to prevent vignetting at short focal lengths.

B+W filter mounts meet these requirements to perfection. As a rule, they are made of brass on highly accurate CNC machines. The filter glass is kept in place securely but without tension by a threaded retaining ring that is manufactured with equal accuracy. Fine grooving (knurling) on the front makes attachment easier. Black (or silver) hard-chrome plating, clearly legible labeling (and usually matte black inside surface) ensure lastingly stable image quality and functionality.

To avoid vignetting in the image corners at extreme wide angles despite the slim design, B+W provides various mount types that cater for the different angles of view.

Creative filter technology – the fascination of precise design

Behind the globally recognized B+W filter quality is a continuous process of optimization and quality control which already begins with the raw glass. Only the finest glass plates are used to manufacture high-precision B+W filter glass, guaranteeing maximum optical filter quality.

In Bad Kreuznach, computer-controlled grinding and polishing machines produce the highest filter quality from this raw material in an impressive range of designs and diameters. Special production processes remain the domain of the optimizing handcraft of experienced specialists. Strict quality checks in all key production steps ensure seamless production standards.

B+W quality does not come about by coincidence, but is clearly defined: to manufacture exactly plane-parallel filter discs without arching or wedge errors (deviating thickness) which could lead to partial image blurring. The filter glass must be completely flat and smooth. It is highly polished as roughness would result in scattered light, leading to reduced contrast. B+W filter glass meets the highest requirements of camera and lens manufacturers and guarantees optimum imaging quality.

The continuous new development and further evolution of the B+W filter models and the final inspection of each individual filter mean that users can always achieve the best possible photographic results. It is therefore important to give the same consideration to quality when buying a filter as when selecting your lenses. 65 years of know-how guarantee top filter quality to meet global market standards.

Close-up and macro lenses provide a simple way of exploring new motif worlds. With infrared filters you make the invisible visible and create artistic, fabulous images. For high color contrasts that still look authentic a polarizing filter is still the best option, despite the possibilities offered by photo-editing programs. Furthermore, polarizing filters can eliminate many reflections. The B+W Soft Pro filters produce a professional soft focus effect. And for action photography – whether it is sailing or mountain biking – B+W protection filters shield the front elements of expensive lenses from scratches and moisture. Experience the fascination of precise creativity with your digital camera thanks to high-quality B+W filters.

By the way: You will find more filters and tips at:

www.schneiderkreuznach.com

Mount Types:

Overview

Filter mounts – the mechanical specialists

The important role played by the filter mount and its mechanically complex task are often underestimated. Although mounts are supposed to fix the high-quality filter glass in position “for life”, they must not cause any sharpness-reducing tension in the glass. B+W manufactures various mount types, mainly out of stable brass, on CNC machines. The filter glass is screwed into a high-precision retaining ring, applying a pre-specified torque. Besides the excellent F-Pro standard mount which is suitable for telephoto lenses up to the most common wide-angle focal lengths, B+W offers the very flat XS-Pro mount for super-wide-angle lenses. This eliminates vignetting. For even more extreme focal lengths there is the oversized mount on which the filter glass protrudes far beyond the thread of the retaining ring (more under “Filter mounts”). It is the high-grade mounts that finally make a B+W filter a true piece of high-tech that you can rely on for many years to come.

Overview B+W Filter Mounts

Ø in mm	XS-Pro Digital			F-Pro	
	Foto	Pol	ND Vario	Foto	Pol
30,5	+	+	-	-	-
35,5	+	+	-	-	-
37	+	+	-	+	+
39	+	+	-	+	+
40,5	+	+	+	+	+
43	+	+	-	+	+
46	+	+	+	+	+
48	-	-	-	+	-
49	+	+	+	+	+
52	+	+	+	+	+
55	+	+	+	+	+
58	+	+	+	+	+
60	+	+	+	+	+
62	+	+	+	+	+
67	+	+	+	+	+
72	+	+	+	+	+
77	+	+	+	+	+
82	+	+	+	+	+
86	+	+	+	+	+
95	+	+	+	+	+
105	-	-	-	+	+
112	-	-	-	+	+
122	-	-	-	+	+

+ = filter is available
 - = filter is not available
 * = ND Vario 95 (Schneider-Kreuznach)

Series filter
 Series 7 - Ø 50,8
 Series 8 - Ø 63,5



Thickness comparison:
 left: standard mount F-Pro
 right: XS-Pro Digital

	XS-Pro Digital	F-Pro
Brass	+	+
Black chromed	+	+
Front screw thread	+	+
For wide angle	+++	++
DSLR cameras	++	+
MFT, CSC, Evil cameras	+++	+
Bridge cameras	+	+
Video, Camcorder	++	+
Full format	from 17 mm	from 24 mm
APS - C	from 12 mm	from 18 mm
Coating	B+W MRC nano	B+W E, B+W MRC
Made in Germany	+	+
Internal Code filters	SHXS-B-B	SH-B-B
Internal Code Pol filters	DHXS-B-B	DH-B-B

Mount Types: *Premium* Line

Premium Line

The ever shorter focal length of zoom lenses for digital system cameras increases their vulnerability to vignetting when attachments such as filters are used. This is why B+W has developed the Premium Line with an extremely shallow filter mount: XS-Pro Digital. It is ideal for demanding DSLR photography with short wide-angle zooms, starting from 12 mm (APS format).

Despite the shallow profile this mount is fully equipped with a front thread for additional accessories such as a lens hood or lockable lens cover. B+W replaces the surface finish of the filter mounts and mechanisms on its flagship XS-PRO filter range with a newly developed coating process. The combi-coating comes from the technology used in the high-tech industries, and it has some ingenious properties: the surface finish is ultra-smooth and results in a very efficient anti-friction property. This optimises the behaviour of the screwing action, and the filter can be screwed in and out effortlessly.

- Wear-resistant, dimensionally stable, for optimum sliding behaviour
- Homogeneous anti-friction layer for easy screwing in and out
- Very good wear resistance, guarantees long service life, long enjoyment of photography
- Dust- and dirt-resistant, easy to clean

Available Filter Types

- 007 Clear MRC nano
- 010 UV-Haze MRC nano
- Käsemann Circular Polarizer HTC MRC nano
- 802 ND 0.6 , 803 ND 0.9 MRC nano
- 806 ND 1.8 , 810 ND 3.0 MRC nano
- ND Vario MRC nano

Premium Line XS-Pro Digital

- Narrow, ideal for wide-angle lenses
- Front thread for additional accessories, snap-in lens cap
- Exclusive MRC nano for the highest demands
- Typical B+W precision and top quality



XS-Pro 007 Clear

MRC nano



XS-Pro 010 UV

MRC nano



XS-Pro HTC High Transmission
Circular Polarizer Käsemann

MRC nano



XS-Pro 806 ND 1.8

MRC nano



ND Vario

MRC nano

Mount Types: Professional Line

B+W Filter Mount F-Pro

The standard filter mount F-Pro has high mechanical stability despite its shallow design. It can be used on most wide-angle lenses without the danger of vignetting. However, exact data regarding focal length and angle of view limitations are not possible because vignetting depends not only on the height of the filter mount and the angle of view, but also on the tube design of the front of the lens. As a guide, this filter mount can be used without vignetting on 35 mm camera lenses (approx. 63° diagonal angle of view). In addition, most wide-angle lenses with 28 mm (approx. 75° angle of view) and in many cases even with 24 mm (approx. 84° angle of view) can be combined with the F-Pro mount without the risk of vignetting. The same angles of view apply to lenses in digital cameras. Despite the thinner design, others filters, snap caps or lens hoods can be attached easily and safely to the front thread.

Another advantage of the F-Pro filter mount: the filter glass is no longer held in place from the front, but from the back by the retaining ring. This prevents the retaining ring from being accidentally loosened during the removal of an additional filter or a lens hood that has been screwed in too tightly.



The picture shows precision-engineered brass mounts in a jig, prepared for surface treatment. To avoid reflections, the mounts are chrome-plated in matte black.

Professional Line

- F-Pro and special mount
- Large selection of diameters and filter types
- Suitable for wide-angle
- Combinable



F-Pro 007 Clear

MRC



F-Pro 010 UV

E MRC



F-Pro S03 Circular Polarizer

E MRC



F-Pro HTC High Transmission
Circular Polarizer Käsemann

MRC

The guardian angels
for lens and image,
the bodyguards against dirt :
the protective filters
from B+W Filter.





Active photography demands a great deal of cameras and lenses. It therefore makes sense to protect the sensitive front element of the lens against flying sand, dust, fingerprints and water with a filter. Filters not only cost a fraction of the price of a lens, but are also easier to clean. B+W protection filters can remain permanently in front of the lens as they are absolutely colorless, highly transparent and extremely low-reflective due to their hard MRC finish. The optical information reaches the image sensor uninfluenced. The filters have no exposure factor.

Protection factors play a particularly important role in digital photography. Larger depth of field due to small sensors increases the influence of front lens soiling on image quality. Particularly in zoom lenses with low light intensity, fingerprints have the effect of reducing sharpness considerably. Frequent cleaning of the front lens, however, can not only cause scratching, but also transport dirt particles or moisture on the edge of the mount into the inside of the lens system.

B+W Coating Systems

	B+W E Single Coating	B+W MRC Multi Resistant Coating	B+W MRC nano Multi Resistant Coating nano
Number of Layers	2 1 layer per side	16 7 + 1 layer per side	16 7 + 1 layer per side
Reflexion	~ 4%	< 0,5 %	< 0,5 %
Transmission	~ 96%	> 99,5%	> 99,5%
Scratch resistant	±	+++	+++
Water repellent	-	+++	++++
Dirt repellent	-	+++	++++
Acclimation	±	+++	++++
Easy to clean	±	+++	++++
Made in Germany	+	+	+
Internal Code	E	M	MRC2

B+W Protection Filter Clear

This filter fulfills the desire of many photographers for pure lens protection without a filter effect. Its only function is to keep dirt, sand or splashes away from the front lens. The extremely clear special glass with high transmission is MRC or MRC nano-finished. The hydrophobic coating reduces the adhesion of particles and water drops. The advantages are easy cleaning and maximum reflection reduction. Also available for super-wide-angle lenses.

B+W Protection Filter UV

The classic among the protection filters blocks the unwanted UV component contained in daylight. The invisible UV light occurs more in pure sea air and in the mountains, and can lead to blur and blue cast. The colorless UV filters are suitable for both analog and digital cameras and ensure more brilliant pictures. They can remain permanently on the lens to protect it from dirt and damage. A high-grade MRC or MRC nano finish provides optimum reflection reduction.



F-Pro 007 Clear

MRC



F-Pro 010 UV

E MRC



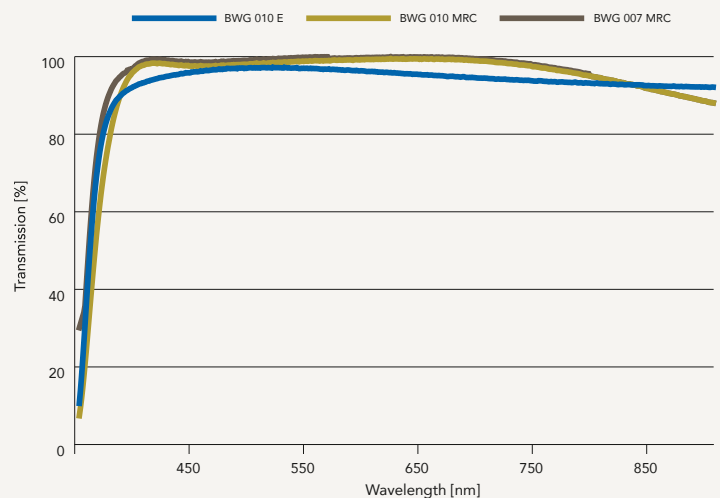
XS-Pro 007 Clear

MRC nano



XS-Pro 010 UV

MRC nano



All photographic

applications

for B+W polarizing filters, ND filters, close-up lenses, effect filters and special filters.

Not forgetting the B+W filter accessories.

Polarizing Filters – reflection reduction par

excellence

Radiant white clouds against a deep blue sky or saturated fall colors are no coincidence. Polarizing filters (pol filters for short) block the bluish gray veil from the diffusely polarized light of the sky. They augment the purity of true colors and increase color saturation. Polarizing filters are amongst the most important filters in (digital) photography. They can be rotated in the mount, allowing the visible regulation of the elimination effect in the viewfinder or on the display. The filter factor of a polarizing filter is approx. between 4 and 8, equivalent to nearly three f-stops. With the High Transmission Käsemann HTC polarizing filter the filter factor is approx. 2 to 3, which is equivalent to approx. 1 to 1.5 f-stops. The maximum effect is achieved at a shooting angle of 90° to the sun. For an even effect in the picture, 35 mm (or 28 mm in 35 mm film format) should be the minimum. The second beneficial effect of pol filters is the reduction of reflections on non-metallic surfaces (water, shop windows, lacquer). Objects behind these surfaces, including writing behind reflecting lacquer, are made visible – a fascinating way to enhance images without using photo editing.

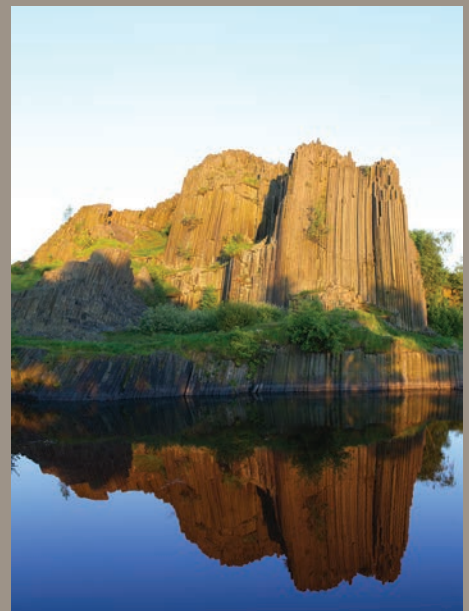


Photo taken without a filter

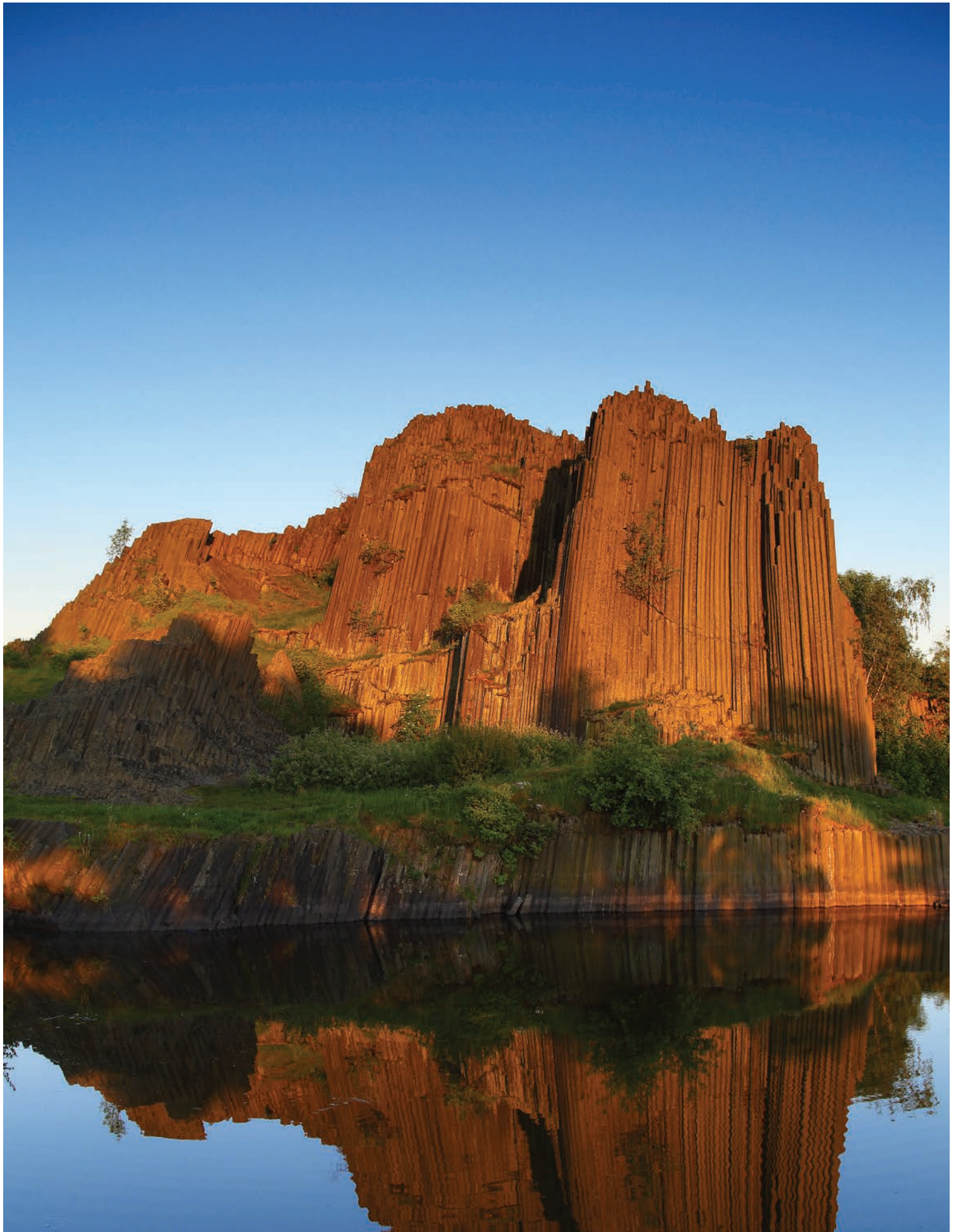


Photo taken with a B+W polarizing filter



16 Photo taken with a B+W polarizing filter

B+W Circular Polarizing Filter

B+W S03 circular polarizing filters are equally suitable for both analog and digital cameras. The filter is of high optical quality and designed for all cameras with and without interior measuring devices (autofocus, exposure meter). This filter reduces reflections of non-metallic surfaces and increases color saturation and contrasts.



F-Pro S03 circular polarizing filter

E MRC

B+W Käsemann High Transmission Polarizing Filter

For this high-end polarizing filter the foil pieces are selected individually for maximum color neutrality. Following cementing between high-grade optical glass, additional grinding and polishing takes place. This guarantees outstanding sharpness even with very bright, apochromatic lenses. The latest cementing technique ensures lasting stability even in damp climates. The new generation of Käsemann High Transmission (HTC) polarizing filters is fitted with a new polarizing foil which has higher translucency (transmission), yet still provides outstanding effectiveness. The filter extension factor is only 2 to 3, equivalent to approx. 1 to 1.5 f-stops.

Available in the F-Pro filter mount exclusively with MRC; in the XS-Pro mount exclusively with MRC nano.



XS-Pro HTC High Transmission Käsemann circular polarizing filter

MRC nano



Photo taken without a filter



F-Pro HTC High Transmission Käsemann circular polarizing filter

MRC



Photo taken with a B+W ND filter



18 Photo taken without a filter

ND Filters

General Information

ND filters – creative using less light

ND filters or neutral density (ND) filters are used if too much light restricts creative possibilities. They reduce the light in accordance with their density. They therefore allow longer exposure times or more widely opened apertures. Applications are highly varied and in some cases experimental. For very bright motifs in the snow or on the beach the aperture would also have to be closed, despite minimum exposure time. This would mean losing the option of short depth of field, e.g. for portraits. ND filters can produce wipe effects in movements if the exposure time can be extended with the required aperture. A waterfall then no longer appears to be frozen, but as a flowing motion. ND filters create ingenious effects in architecture or urban photography. With long exposure times of several hours, people walking through the shot are blurred or not reproduced at all. For physical reasons, very dense filters possess a warm tone which can be compensated in image processing.

All ND filters are available with single coating or high-quality B+W MRC finish.

PLEASE NOTE: ND filters must not be used for direct visual solar observation (risk of blinding). They let through UV and IR rays which harm the eyes.

Special sun filters for direct observation of the sun are available from astronomy suppliers.

Technical Data

Type	Optical Density	F-stops	Filter factor	LV	%
101	– ND 0.3	+1	2 x	-1	50
102	802 ND 0.6	+2	4 x	-2	25
103	803 ND 0.9	+3	8 x	-3	12.5
106	806 ND 1.8	+6	64 x	-6	1.6
110	810 ND 3.0	10	1,000 x	-10	0.1

Example

Stop >	8	11	16	22	32
Time >	1/500	1/250	1/25	1/60	1/30
ND 0.3	1/250	1/125	1/60	1/30	1/15
ND 0.6	1/125	1/60	1/30	1/15	1/8
ND 0.9	1/60	1/30	1/15	1/8	1/4
ND 1.8	1/8	1/4	0.5 sec.	1 sec.	2 sec.
ND 3.0	2 sec.	4 sec.	8 sec.	15 sec.	30 sec.

B+W ND Filters 101, 102, 103, 106 and 110

B+W ND Filters 101 and 102

The ND filter series begins with low light attenuation. Type 101 reduces the light by exactly one f-stop (filter factor 2x), type 102 by two f-stops (filter factor 4x).

The moderate extension of the exposure values is recommended for indoors or outdoor shots with little light. At lower shutter speeds, creative soft focus effects, wipe effects and flowing effects for waterfalls can be achieved. Opening the aperture allows selective focus instead of deep focus – a desired effect when filming videos with DSLRs.

B+W ND Filter 103

This already quite strong ND filter reduces the light by up to three f-stops, equivalent to a filter factor of 8x. It offers more options than weaker ND filters. This is already sufficient for successful time-exposure effects, and it can also be regarded as a universal ND filter in digital photography. White balance with the filter ensures optimum color neutrality. Tip: Remember to use a tripod for longer exposure times!

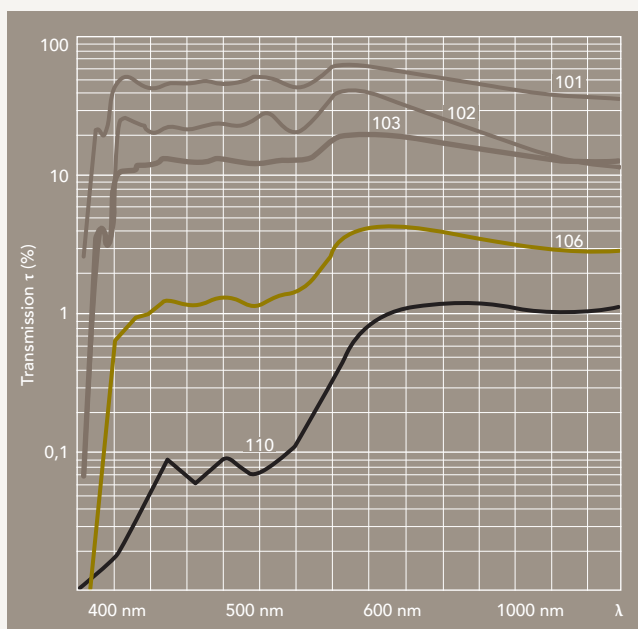
B+W ND Filter 106

With its light reduction by six f-stops (filter factor 64x) this filter allows even more extreme experiments. This includes time-exposure effects such as light trails, flowing effects for moving water or walking people who become indistinct in soft focus. A physically induced higher red transmission produces a slightly warm tone. If necessary, this can be eliminated by white balance or an image processing program.

B+W ND Filter 110

With exceptional light reduction by a full ten f-stops (filter factor 1000x) the 110 continues what begins with the 106: experimental photography with very slow shutter speeds. Continuous light trails, walking people on roads and squares become indistinct or even "invisible." The flowing effect for moving water becomes even more extreme.

For physical reasons, the filter produces a slightly warm tone which can be eliminated by white balance or an image processing program.



F-Pro 101 ND Filter

E MRC



F-Pro 102 ND Filter

E MRC



F-Pro 103 ND Filter

E MRC



F-Pro 106 ND Filter

E MRC



F-Pro 110 ND Filter

E MRC

B+W XS-Pro ND filters 802, 803, 806 and 810

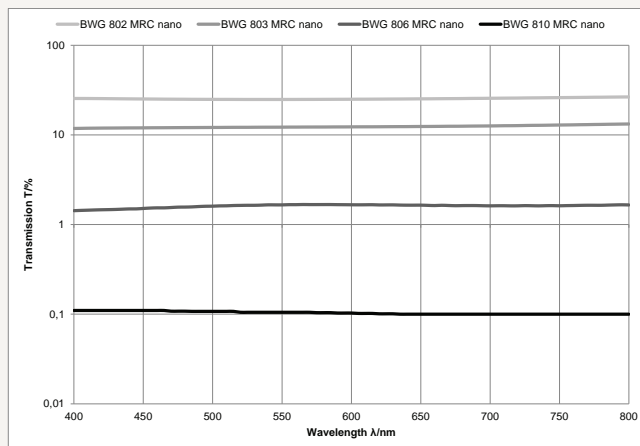
The new B+W ND Filters

The excellent, finely ground and polished special glass is used as the basis for the new ND filter glasses. This guarantees the necessary optical quality, and also does not have any adverse effect on a correspondingly high-quality lens.

In the thin-film technology that has been developed here, it is not just the pure ND filter effect that delivers results: a 3-layer combination coating also optimises the ND filter. In addition to the filter effect, the combination coating also prevents troublesome reflections by including a multilayer anti-reflection component with seven layers on each side of the filter.

Finally, an outer layer with the usual dirt- and water-repellent properties is applied. With this feature, the filter not only has all-round protection, but simple cleaning and care of the filter disk are also taken care of. The light attenuation itself is very uniform over the entire visible range and therefore produces optimal, colour-neutral images.

By being able to use this coating technology at specified glass substrates, the process can also be applied in the B+W XS-Pro digital filter range.



XS-Pro 802 ND 0.6

MRC nano



XS-Pro 803 ND 0.9

MRC nano



XS-Pro 806 ND 1.8

MRC nano



XS-Pro 810 ND 3.0

MRC nano

B+W F-Pro Graduated ND Filters 701 and 702

Graduated ND filters – balance between heaven and earth

Graduated filters are colorless and compensate excessive contrasts between the sky and the landscape. Clouds gain definition, sky blue acquires depth. The filters can be rotated in the mount in order to adapt the graduation to the horizon. Alignment is performed in the viewfinder or on the camera's display. If exposure metering is done through the filter, a minus correction of approx. 0.5 is advisable. The graduation is applied by means of thin layer technology.

B+W Graduated ND Filter 701 – 50%

The neutral-gray half of this graduated filter with transparency of 50% (1 f-stop) darkens the motif area by one f-stop without changing the colors. If, for example, the sky is too light in relation to the landscape, this is the ideal value for good cloud rendition and to prevent the blue sky from becoming too pale due to overexposure.

B+W Graduated ND Filter 702 – 25%

Extremely well defined clouds and a full-bodied instead of milky tone in the sky – these are the effects produced by this already stronger graduated filter. It attenuates the light in the darkest zone by two f-stops (transparency 25%). Very high-contrast landscape motifs without loss of definition become possible. The graduation zone allows some degree of tolerance, but for a natural transition the horizon line should not be positioned too far from the center of the image.

Additional information

The gray gradient is applied by means of thin-layer technology. The special coating process requires a special masking. This is associated with certain manufacturing tolerances, with the result that the graduation boundary is not exactly parallel. Because this transition is outside the focus range, the effect is not visible and there is no static transition.



F-Pro 701

MRC



F-Pro 702

MRC



Photo taken with a B+W graduated filter 702

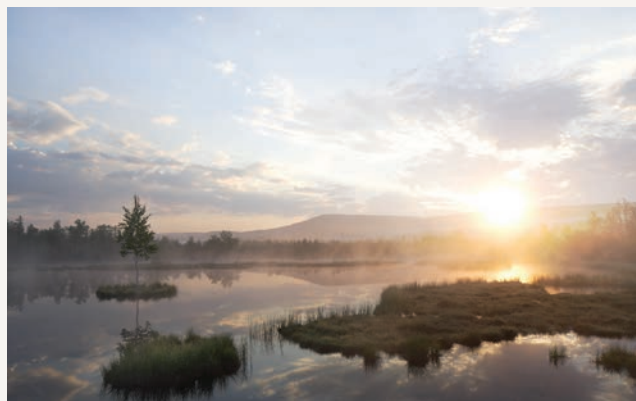


Photo taken without a filter

B+W XS-Pro Digital ND Vario MRC nano

Flexible light control without changing filters: The Vario ND filter can be adapted in its effect to a wide range of subject situations and photographic requirements. Portrait photographers, for example, usually also need large apertures in bright ambient light in order to separate their model optically from the background. Using several minutes of exposure time, architectural photographers can make people passing through the motif “invisible”. In landscape photography, flowing water or the surface of the sea can be made to appear fluffy and soft with long exposure times: classic situations which make the use of an ND filter indispensable.

Thanks to its infinitely variable density, the B+W Vario ND filter can be adjusted exactly to individual requirements. To this end, it comes with a continuous setting function with which the photographer can determine the required density between +1 and +5 f-stops. To prevent aberrations, the light reduction cannot be set beyond a critical level. The XS-Pro Digital ND Vario MRC nano thus guarantees professional image results, even with high filter factors.

ND Vario values

F-stops	Optical Density	Filter Factor	Transmission
1	0.3	2x	50 %
2	0.6	4x	25 %
3	0.9	8x	12.5 %
4	1.2	16x	6.25 %
5	1.5	32x	3.12 %

Info

Due to different directions of light incidence (light rays scatter differently in the center of the picture than at the edges), an aberration may occur when taking the picture. This first becomes visible in the corners and in extreme cases it can appear in a cross pattern. This becomes noticeable with wide angle lenses 28 mm (equivalent to 35 mm format) and less. These irregularities also occur with excessive dimming. As the B+W ND Vario features a stop for the brightest and darkest positioning, this is avoided.

In order to obtain even image results the focal length should not be less than $f = 28 \text{ mm}$ (35 mm).

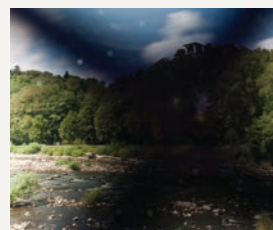
Thanks to the double-sided multicoating layer, the proven B+W MRC (Multi Resistant Coating) nano coating eliminates unwanted stray light and delivers visibly more brilliant colors and higher contrasts. Due to the extremely low residual reflection, ghost or multiple images which occur due to back reflection from the image sensor are also avoided. The outer layer treated with nano technology (lotus effect) allows water to bead off far better and makes cleaning the filter easier.

Tip: DSLR photographers should cover or close the optical viewfinder during longer exposure times in order to avoid measuring errors. Like all B+W ND filters the XS-Pro Digital ND Vario MRC nano also works on a color-neutral basis. At high densities, slight chromatic aberrations in the image may occur for physical reasons. These can subsequently be eliminated with ease using white balance or by working in RAW format in the image-editing program. When using a full-frame camera, the focal length should be no less than 35 mm to achieve maximum image quality when selecting higher densities.

Sizes

Lens Thread	40,5	46	49	52	55	58	62	67	72	77	82	95
Front Thread	43	49	52	55	58	62	67	72	77	82	86	105

The B+W ND Vario filters are oversized. Hence the difference between the lens connector thread and the front connector of the filter.



Strong aberration:
cross-shaped shadowing



Without aberration:
Using B+W ND Vario filter

B+W Filter Holder for 100 x 100 x 2 mm Square Filter

Adaptable solution, popular with landscape photographers

The cornerstone for this type of filter system is a filter holder that is screwed onto the lens by means of adapter rings. The filter channels take square filters with push-in dimensions of 100 mm width and 2 mm glass thickness. The filter holder has adjusting screws that can be used to accommodate possible variations in the thickness of the filter glass. The channels in the filter holder can take up to three push-in filters. To prevent reflections, the filter holder is designed with a matt black finish.

Swappable adapter rings enable the filter holder to be screwed onto lenses of differing diameters. Direct adapter rings are available for lens mounts with a diameter of 67, 72, 77 and 82. For intermediate sizes, additional adapter rings are available in the B+W product range (see page 38).



B+W Filter Holder 100 x 100 mm with adapter ring

B+W Filter Holder for square filter 100 x 100 x 2 mm

1089607	Filter holder without adapter
separate to order	
1089608	Adapter ring für Ø 67
1089609	Adapter ring für Ø 72
1089610	Adapter ring für Ø 77
1089611	Adapter ring für Ø 82



B+W Filter Holder on Camera



Photo taken without filter

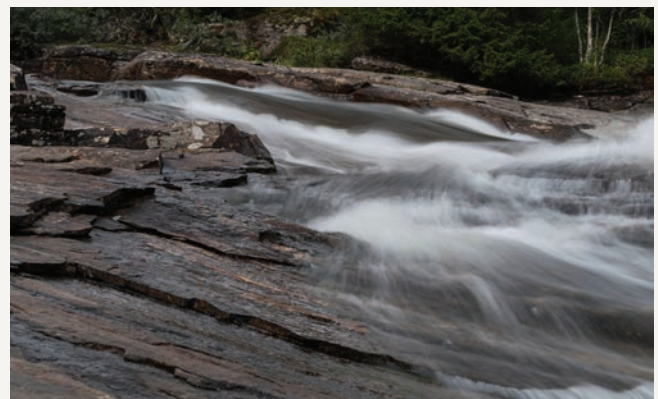


Photo taken with B+W 802 ND 3.0 Square Filter

B+W Square Filter

For more creativity in landscape photography

The ND filter technology of the new generation of type 802 - 810 filters fits perfectly with the push-in filter system. The new coating technology has made it possible to adjust the filter effect of existing base substrates. This enables filters for 2 mm push-in systems to be implemented.

Already available are the B+W graduated ND square filters, types 701 and 702, which are supplied with dimensions 100 x 150 x 2 mm. One half of the square filter is tinted neutral grey, with a smooth transition into the filtered half. The rectangular filter can be slipped into the filter holder and then rotated to exactly align the graduation axis with the horizon.

Both of the ND series are dimensionally stable thanks to the glass substrate and cannot warp or distort. They are robustly resistant to scratches and, assuming they are looked after properly, significantly longer lasting than plastic materials.

The square filters are supplied in a practical transport box made of tinplate.

Overview Square Filters 100 x 100 x 2 mm

Category	Type	Coating
ND Filter	802	ND 0.6 + 2 stops
	803	ND 0.9 + 3 stops
	806	ND 1.8 + 6 stops
	810	ND 3.0 + 10 stops
ND grad.*	701	ND grad. 50 %
	702	ND grad. 25 %
		MRC nano
		MRC

* ND grad. 100 x 150 x 2 mm



B+W 701 MRC, 50%



B+W 702 MRC, 25%

Graduated MRC filter as 100 x 150 x 2 mm square filter



Filter Holder with B+W ND Graduated 702 MRC

Tip

The square filter is printed in the margin. The filter is inserted correctly when the printing can be read from the camera position.



Photo taken without filter



Photo taken with B+W ND 702 Filter



Close-Up Lenses – small world in XXL.

Close-up lenses – reading glasses for your lenses

Would you like to explore fantastic worlds in miniature? Close-up lenses open up new motifs in an inexpensive way. Like reading glasses, close-up lenses move the focus range into the close-up zone. The effect increases with the diopter number and the focal length of the lens. For shorter focal lengths in digital photography stronger close-up lenses are therefore recommended. The image scale describes the effect. A scale of 1:3 renders an object at a third of its original size on the film/sensor. Close-up and macro lenses are simple aids which are suitable in particular for three-dimensional objects (flowers) and pictorial photography, less for technical reproduction purposes. Sufficient stopping down increases the sharpness and the depth of field.

Tip: Use a tripod for longer exposure times.



B+W Close-Up Lenses

As clearly illustrated, the stronger the close-up lens, the closer you can get to the subject with the same distance setting and the larger the image you can obtain. A longer exposure time is not necessary. B+W close-up lenses can be combined, but for quality reasons and to prevent vignetting no more than two lenses should be mounted over each other. The values are simply added together.



B+W Macro Lens

With extremely high +10 diopter power this close-up lens goes beyond the normal scope. Its high refraction is ideal for the short focal length of digital photography. Even at a focal length of just 50 mm you enter the macro range, with an image scale of approx. 1:2. To increase (depth of) focus, stopping down by three f-stops is recommended. If graduated sharpness is part of the image concept, open apertures can also be used.



Close-up lens

E

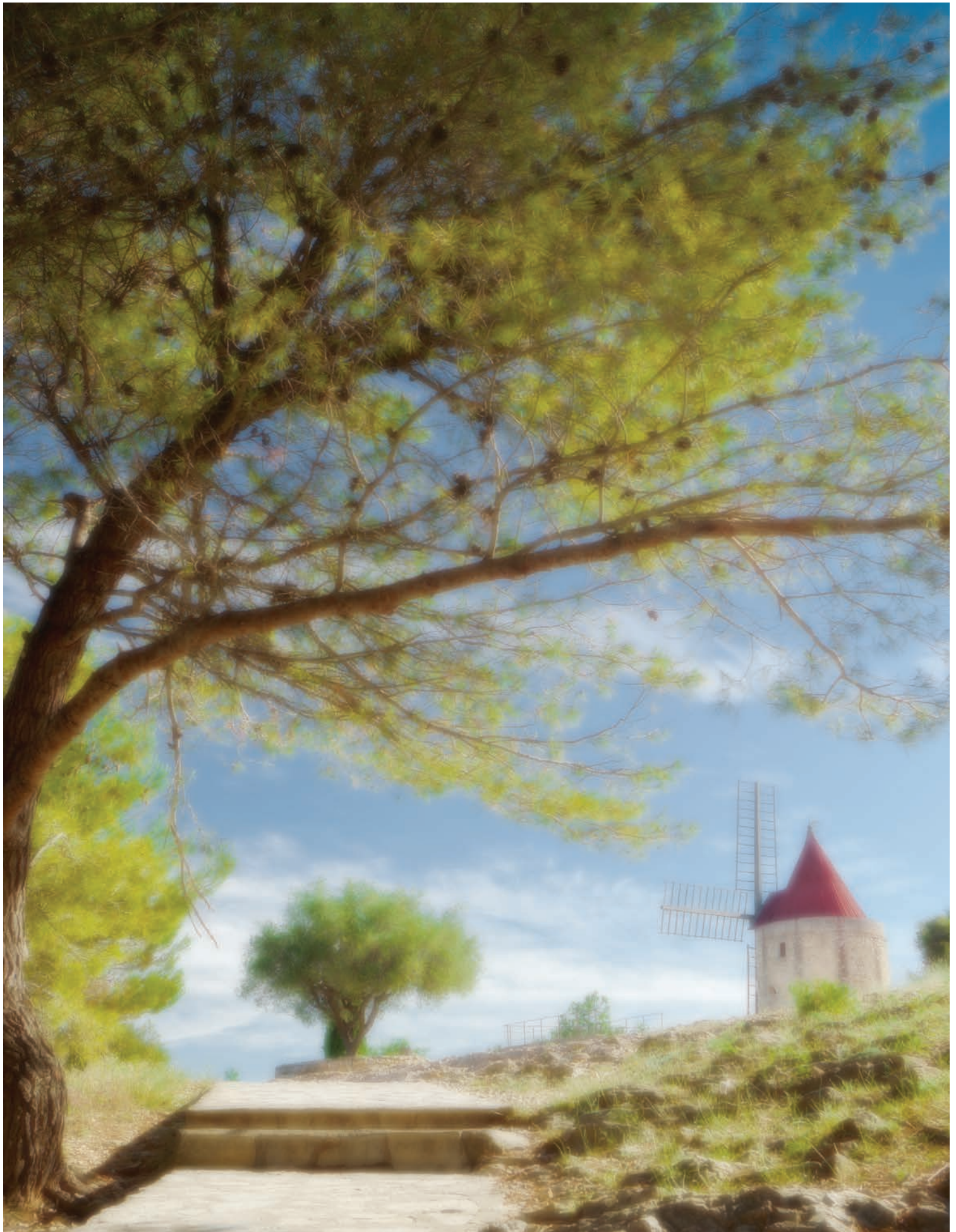


Macro lens¹

E

Close-up lenses +1, +2, +3, +4 and +5
Macro lenses +10 in special mount Ø 49, 52, 55 and 58

¹ Made in Japan.



Soft Focus Attachment

The term “soft focus attachment” does not do justice to this soft filter. The filter delivers sharp pictures which are softly overlaid with unsharpness. Details such as eyelashes do not taper into unsharpness, while skin blemishes are gently covered up. Small mini-lenses are distributed randomly on a precisely plane-parallel glass disc. They scatter the light and overlay the sharp core image with hazy, diffuse halos. This opens up deep shadows, while highlights themselves are hardly blurred, but instead form a shimmering aura in the darker surroundings. Professionals, even in Hollywood films, use these stable glass filters when aiming for perfect beauty shots. The effect cannot be achieved with image-processing software (e.g. Gaussian blur). As well as for portrait photography, soft focus attachments are frequently used for great effects in landscape shots. They reduce high contrasts and the light fringes in the backlight are softened. The photographs take on a gentle, romantic character.

B+W Soft-Pro – precise beauty softener

A special soft focus attachment with irregularly distributed micro-lenses on precisely plane-parallel clear glass. The sharp core image is overlaid with a soft unsharpness. Ideal for dreamlike feminine portraits, softly shimmering, backlit blond hair, soft dream landscapes, and all without much loss of sharpness. The B+W Soft Pro largely retains the overall contrast, working almost independently of focal length and aperture, thereby allowing control of the depth of field. It poses no difficulties for autofocus systems.



Photo taken without a filter

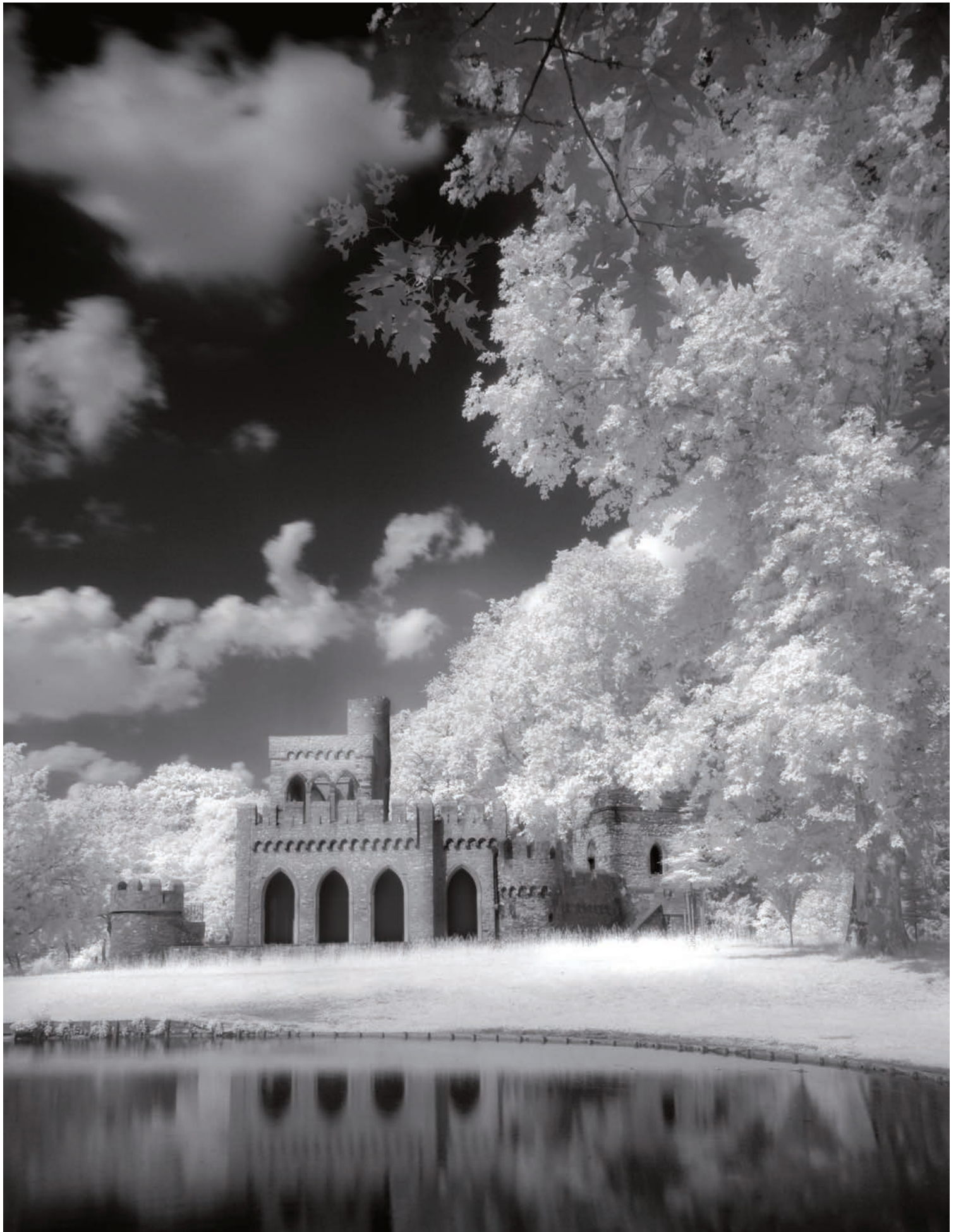
Cross Screen, 4x, 6x and 8x

B+W effect attachments make unusual photos possible. Suitable motifs become even more attractive. This results in pictures with a look that stands out positively when it is consciously employed.

Cross screen filters consist of high-quality optical glass into the surface of which fine grating structures are integrated. Depending on the form of grating, light sources or bright reflections shine in a multi-star pattern that surrounds them. It is important that the light sources are bright and dot-shaped. Then the subtly colored star effect forms in very high definition.



Photo taken with a B+W F-Pro Cross screen filter



Infrared digital – special filters for extreme contrasts

The two special filters Infrared Filter 093 and UV/IR Blocking Filter 486 perform opposing tasks. The UV/IR Blocking Filter 486 blocks unwanted ultraviolet and infrared light components that can produce ghost images and sharpness-reducing interference. The images gain sharpness, detail and fine color gradations. Digital cameras have similar filters in front of the image sensors; nevertheless, considerable residual transmission is detectable in the infrared range. A gap that is closed by the UV/IR Blocking Filter 486.

It is precisely this gap that the Infrared Filters 092 and 093 make use of. Digital cameras with sufficient IR residual sensitivity take highly typical infrared pictures when the visible light is blocked. The black-red Infrared Filter 093 is ideal for this task. The image section is selected and infrared focusing performed before attaching the filter.

B+W Infrared Filters 092 and 093

The B+W Infrared Filter 092, which is almost black but when placed in front of a light source is in fact dark purple. It blocks visible light up to 650 nm, and only at just under 700 nm it transmits 50% (hence the dark-red color). For 730 nm to 2000 nm the transmission is very high with over 90%. This allows shots of the pure red and infrared image. This IR filter is suitable for most digital cameras.

The IR filter 093 blocks visible light (up to 800 nm) almost completely. It is dark red, almost black. With analog IR film or IR-sensitive digital cameras it delivers a fantastic wood effect (white leaves) and a typically dark sky. The exposure values vary according to the digital camera model being used and are best determined by experimenting. They are usually in the range of a few seconds. Focusing is performed first without a filter using IR focus correction.



Photo taken without a filter

B+W Digital UV/IR Blocking Filter 486

This filter has a steep cut-off effect for unwanted ultraviolet and infrared light. In digital cameras and camcorders without full filtering in front of the image sensor it prevents color casts and unsharpness. The brilliance and sharpness of the images are increased. This takes place by interference between vacuum-deposited layers and not by absorption via colored glass. This principle is ideal for angles of view up to 60° or smaller. The filter has no exposure factor.

Tip: Digital infrared photography

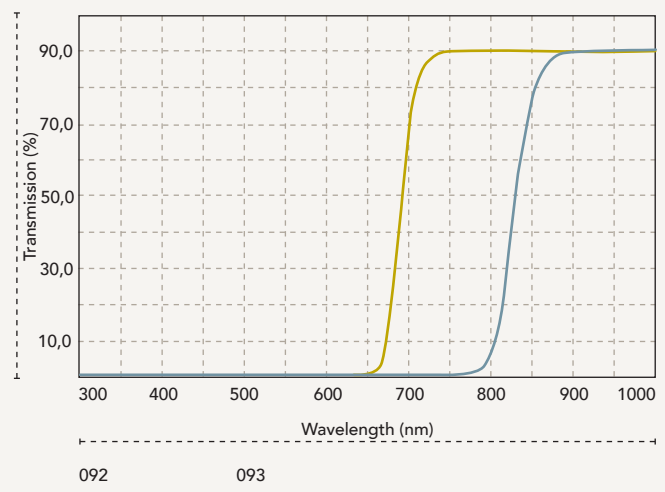
Whether or not a digital camera is IR-sensitive can be determined with an IR remote control. Instructions can be found on the Internet. The IR focus point is somewhat further away than that for visible light. With the filter attached, white balance is performed automatically or (preferably) manually. The IR photos are optimized in the image-processing program: Increase contrast automatically or in the histogram, convert color images to black and white or experiment with individual color channels, leaving the red channel on maximum. No matter whether digital or analog, infrared photography is experimental by nature.



F-Pro 093 Infrared Filter



F-Pro 486 UV/IR Cut Filter



Black and White Filters

Consciously composed black and white photography enjoys undiminished popularity. However, the conversion of the colors into gray-scale values does not correspond to the brightness perception of the human eye, in neither film nor digital photographs. Filters are therefore indispensable for black and white photography.

A simple rule explains the mode of action: The filter's color is made lighter, the complementary color is made darker. An apple tree serves as a good example: When using a red filter, a red apple appears lighter and the green leaves are reproduced darker. In contrast, a green filter lightens the leaf green and darkens the red of the apple.

Yellow filters very visibly increase the contrasts (by darkening the sky) in landscape photos. The pictures gain more brilliance, with plant green receiving more differentiated reproduction. A medium yellow filter is regarded as the standard filter in black and white photography. An orange filter increases this effect, making a diffuse sky of clouds appear much more dramatic. The skin blemishes of a model (red patches) are also concealed.

The group of the red filters increases this effect to the point of estrangement. A summer landscape photo with a cloudy sky is transformed into a dramatic storm mood (wood effect), and a dune landscape becomes a moonscape with an almost black sky.

Tip: On digital cameras with a black and white mode you can achieve these effects while taking the shot and view them on the camera monitor. Subsequent conversion using image-processing programs is unnecessary.

Black and white filters also improve the resolution and sharpness of the image. With these filters the lens is used only in a narrow-band or even monochromatic color spectrum. All the chromatic aberrations of a lens, such as longitudinal and lateral chromatic aberrations, are significantly reduced or almost completely eliminated, depending on the filter. Light that was previously filtered is no longer "available" for aberrations.



F-Pro 022 Light Yellow Filter

E MRC



F-Pro 040 Orange Filter

E MRC



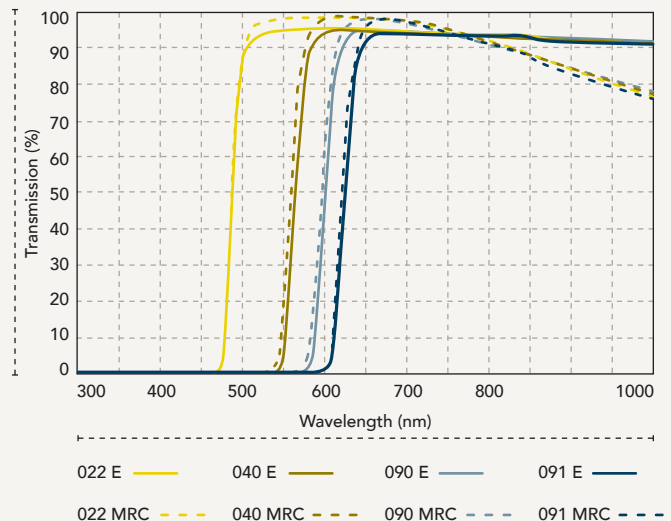
F-Pro 090 Light Red Filter

E MRC



F-Pro 091 Dark Red Filter

E MRC





taken without a filter



taken with a B+W Filter light red 090



color picture



taken with a B+W Filter orange 040



taken with a B+W Filter dark red 091



taken with a B+W Filter yellow 022

Accessories

Only clean optics deliver good pictures

Dust and fingerprints are the biggest enemies of extremely high image quality and they also impair the optical performance of high-quality lenses or optical filters. Heavy residue on the filter, the lens front, and even on the rear of the lens can reduce the amount of light that is allowed through to the sensor so strongly that stray light, ghost images and reflections diminish contrast and weaken colour saturation. Regular and above all correct cleaning of lenses and filters is therefore paramount for serious photographers. B+W provides new professional cleaning and maintenance products for precisely these purposes.

Areas of application

Optical filters, front and rear lenses of DSLR cameras, CSC-, MFT system cameras, compact cameras, video cameras and camcorders, as well as spotting scopes, binoculars and telescopes, smart phones, tablets and coated eyeglass lenses.

B+W Cleaning Sets

The B+W cleaning utensils are available in different care sets. The sets include a practical draw-cord pouch in which the utensils can be kept. Held together compactly like this, it can also be kept in a smaller camera bag. The pouch is big enough to accommodate further contents depending on personal needs.



Accessories



B+W Lens Cleaner For stubborn dirt

With its highly effective cleaning substances the tried and tested pump spray for highly sensitive optical surfaces also removes firmly adhering dirt particles that cannot be removed by brush and microfiber cloth alone. The pump spray is easy to use and leaves no unwanted residues on the lens or filter glass.



B+W Cleaning Cloth Microfibers for perfect cleanliness

The new B+W microfiber cloth provides high cleaning efficiency and is especially suitable for coated optical surfaces such as photo filters and lenses. Thanks to its size of 20 x 20 cm and its flat surface without elevations, it is easy and efficient to use. The cloth is washable up to 40° C and should be washed by hand after being used about eight to ten times with a mild detergent and rinsed thoroughly. The cloth is supplied in a sturdy case.



B+W Cleaning Brush Gentle cleaning

The hairs of the new B+W cleaning brush are made of very fine goat hair which gently and effectively remove above all loose dust and dirt particles from sensitive optical surfaces. The brush hairs are natural, undyed and not cut. This means that there are no angular ends, and the hair tips glide gently over the surface to be cleaned. At 12 cm long the cleaning brush is compact and comes in a special tube to protect the delicate goat hair.



B+W Cleaning Brush Professional version

The professional version of the cleaning brush is 15 cm long and also made from high-quality goat hair. In addition, the brush has a magnet at the lower end and can therefore always be placed ready to hand at the workplace.

B+W Bellows² Cleaning without touching

The new bellows from optical specialist B+W helps when contactlessly removing loose dust on sensitive optical surfaces. With a total length of 15 cm and a generously sized hand bellows made of easy-care, durable rubber, it lies very well in the hand. The powerful air flow can be guided precisely using the attached air nozzle. Not only lenses and filters, but also inaccessible parts of sensitive equipment surfaces can be kept clean using the hand bellows. Moreover, it is suitable for device-friendly dust removal on the inside of precision devices such as cameras (mirrors), watches, telescopes and more.



Article No.	
1086190	CLEANING SET, five-part B+W Cleaning tissue, approx. 20 x 20 cm B+W Cleaning brush, approx. 120 mm Bellows, approx. 15 cm Lens Cleaner pump spray, 50 ml Pouch
1086189	CLEANING SET, four-part B+W Cleaning tissue, approx. 20 x 20 cm B+W Cleaning brush, approx. 120 mm Lens Cleaner pump spray, 50 ml Pouch
1086191	CLEANING SET, two-part B+W Cleaning brush, approx. 120 mm Bellows, approx. 15 cm
1082938	LENS CLEANING SET, two-part B+W Lens Cleaner pump spray, 50 ml B+W Photo Clear cleaning tissue, approx. 18 x 18 cm
1085778	B+W Brush with magnet, approx. 150 mm
1085775	B+W Bellows, approx. 15 cm
1065854	B+W Lens Cleaner pump spray 50 ml
43094	B+W Photo Clear cleaning tissue, approx. 18 x 18 cm
43128	B+W Pro cleaning tissue, approx. 31 x 37 cm

Accessories

B+W Photo Clear Microfiber Cleansing Cloth¹

There is no better cleansing and care cloth for sensitive optical equipment: The B+W Photo Clear is made from a high-tech microfiber which is free of chemicals and lint, and cleans gently but thoroughly. It can be washed in an environmentally safe manner, and used again and again without losing any of its properties – an accessory of frequently underestimated importance for imaging performance. Available in approx. 18 x 18 cm and 31 x 37 cm sizes, each with a protective plastic envelope.

TIP

The first step in cleaning filters is to remove loose particles. If possible, this should be done without any contact, preferably with compressed air or bellows. A suitably fine brush, one designed for optical surfaces, can also be used for this purpose.

- Any remaining solid contaminants can usually be cleaned with a B+W Photo-Clear microfibre cleaning cloth.
- Most firmer dirt particles can be removed with gentle wiping. For greasy stains such as fingerprints, breathing on the surface can help.
- If the solid contaminants cannot be removed with this cleaning method, B+W Lens Cleaner II will provide further help



B+W Lens Cleaner II Cleansing Spray

Persistent marks on highly sensitive optical surfaces cannot be removed with a cloth alone. The B+W Lens Cleaner II has been developed for this purpose. It is a cleansing solution with highly effective cleansing agents which leave no unwanted residue on the glass. The propellant-free pump spray is simple to use, non-flammable and bio-degradable. Indispensable for photo trekking or outdoor action photography.

Lens Cleaner II is also suitable for LCD/TFT screens.



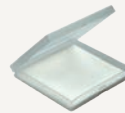
Nylon Fabric Filter Pouches²

These filter pouches are made of padded, heavy-duty and water-repellent nylon fabric with practical Velcro fasteners and a white space for labeling.



B+W Filter Pouch B4² and B6²

The folding, foam-padded pouch made of flexible plastic material can hold up to six filters. Snap fasteners and transparent inner compartments ensure quick, easy access and the secure positioning of the filters. When folded, the pouch also fits into the front compartment of a photo bag for fast, convenient removal.



B+W Individual Filter Case

B+W provides various cases for the safe, dust-proof storage of filters. The flat, handy filter cases made of hard but transparent plastic let you see right away which filter is stored inside.

A shock-absorbing foam insert prevents slipping and rattling. The sturdy individual cases are available in three sizes, with additionally available inserts reducing the dimensions for smaller filters.

Type	Dimensions	Filter up to
B+W Single filter case BH	57 x 57 x 15 mm	Ø 52 mm
B+W Single filter case D	85 x 85 x 15 mm	Ø 82 mm
B+W Single filter case	110 x 110 x 15 mm	Ø 105 mm
B+W Pouch B 6	6 filters up to	Ø 62 mm
B+W Pouch B4	4 filters up to	Ø 82 mm
Schneider Pouch 11,5	115 X 115 mm for 1 filter	Ø 77 mm
Schneider Pouch 14,5	145 X 145 mm for 1 filter	Ø 105 mm
Schneider Pouch 20	200 X 200 mm for 1 filter	over Ø 105 mm

¹ Made in Japan

² Made in China

Accessories



B+W Adapter Rings

If photo equipment is to include lenses with different filter thread diameters, the B+W adapter rings can adapt filters and supplementary lenses to different lens diameters. This is less expensive than buying several lenses with the same filter type – money that would be better invested in a larger selection of filters. When buying filters, first check the largest diameter required. When there are three different diameters to cater for at the same time, adapter rings can also be combined if necessary. Increased thickness due to using several mounts can result in vignetting. B+W offers a wide range of adapter rings.



B+W Snap Cap Pro 311²

Hard plastic cap with two spring-loaded plastic claws opposite each other that engage the front thread of the lens (or filter). Simple removal by pressing the two buttons together means fast and uncomplicated one-hand operation. Available for thread sizes 52, 55, 58, 62, 72 and 77, 82 and 95.

Overview adapter rings

Ident no.	Filter Ø in mm	Lens in mm
27525	82	72
27526	82	77
69434	77	67
41214	77	72
41771	77	62
69436	72	67
69437	72	62
69438	72	58
1064025	77	58
69439	67	62
69441	67	58
69443	67	52
69445	67	49
69448	62	58
41213	62	52
69451	62	49
69456	60	55
69457	58	55
69459	58	52
69464	58	43
69465	58	40,5
40993	55	49
40994	52	49
41197	52	46
69483	52	43
69485	52	40,5
26071	52	37
41208	49	46
69496	49	43
69498	49	40,5



B+W Collapsible Lens Hoods 900¹

Collapsible lens hoods are made of high-grade rubber. Their advantage compared to fixed lens hoods made of plastic or metal is that, in their collapsed state, they protrude only a short distance. This means that the lens hood can remain attached to the lens and, together with the camera, will also fit into a tight photo bag.

- Lens hood compact
- for normal focal lengths
- matt black surface



B+W Metal Lens Hoods

B+W metal lens hoods convey a reassuring, stable impression by their very appearance. The black anodized aluminum reliably blocks stray light, and the precision-engineered tubes have black inner ribs for even greater absorption of unwanted light.

- B+W Metal Lens Hood 950 for standard lenses and short telephoto lenses
- B+W Metal Lens Hood 960 with a narrower and longer tube for telephoto lenses
- B+W Metal Lens Hood 970, suitable for wide angle (zoom) lenses up to 70° diagonal angle of view

Overview B+W Lens hoods

Ø in mm	900	950	960	970
37	+	-	-	-
39	+	-	-	-
40,5	+	-	-	-
43	+	-	-	-
46	+	-	-	-
49	+	+	+	+
52	+	+	+	+
55	+	+	+	+
58	+	+	+	+
62	+	+	+	+
67	+	-	+	+
72	+	-	+	+
77	+	-	+	+
82	+	-	+	+
86	-	-	-	+
95	-	-	+	-
105	-	-	-	+

You will find overviews of the product range and further information on the B+W filters on the Internet at: www.schneiderkreuznach.com

Category	Type	B+W Filter	Coating			Holder		Square filter Size	Series	
			E	MRC	MRC nano	XS-Pro* Ø in mm	F-Pro Ø in mm		7	8
Protection Filter	007	Clear-Filter	-	+	+	30,5 - 95	37 - 122	-	+	+
UV Filter	010	UV-Haze-Filter	+	+	+	30,5 - 95	-	-	+	+
Käsemann Filter	HTC M	High Transmission Circular Polarizer	-	+	+	30,5 - 95	37 - 122	-	AUC MRC	
Polarizing Filter	503	Circular Polarizer	+	+	-	-	37 - 82	-	-	-
ND Filter	802	ND 0,6 +2 stops	-	-	+	30,5 - 95	-	100 x 100 x 2 mm	-	-
	803	ND 0,9 +3 stops	-	-	+	30,5 - 95	-	100 x 100 x 2 mm	-	-
	806	ND 1,8 +6 stops	-	-	+	30,5 - 95	-	100 x 100 x 2 mm	-	-
	810	ND 3,0 +10 stops	-	-	+	30,5 - 95	-	100 x 100 x 2 mm	-	-
	101	ND 0,3 +1 stops	+	+	-	-	37 - 122	-	+	+
	102	ND 0,6 +2 stops	+	+	-	-	37 - 122	-	+	+
	103	ND 0,9 +3 stops	+	+	-	-	37 - 82	-	+	+
	106	ND 1,8 +6 stops	+	+	-	-	37 - 82	-	+	+
	110	ND 3,0 +10 stops	+	+	-	-	37 - 82	-	+	+
ND-Vario Filter	ND	ND-Vario +1 up to +5 apertures	-	-	+	40,5 - 95	-	-	-	-
ND Graduated Filter	701	ND grad. 50 %	-	+	-	-	49 - 82	-	-	-
	702	ND grad. 25 %	-	+	-	-	49 - 82	-	-	-
Black and White Filter	022	Yellow 495	+	+	-	-	37 - 122	-	+	+
	040	Orange 550	+	+	-	-	37 - 122	-	+	+
	090	Red - light 590	+	+	-	-	37 - 122	-	+	+
	091	Red - dark 630	+	+	-	-	37 - 122	-	+	+
Infrared Filter	092	Infrared - dark red 695	-	-	-	-	37 - 77	-	+	-
	093	Infrared - black red 830	-	-	-	-	37 - 77	-	+	-
Special Filter	403	UV passing filter	-	-	-	-	37 - 77	-	+	+
	415	UV cut 400	-	-	-	-	37 - 77	-	+	+
	486	UV-IR-Cut	-	+	-	-	37 - 122	-	+	+
Close-Up Lenses	NL-1	Close-up lenses +1 diopters	+	-	-	-	37 - 77	-	-	-
	NL-2	Close-up lenses +2 diopters	+	-	-	-	37 - 77	-	-	-
	NL-3	Close-up lenses +3 diopters	+	-	-	-	37 - 77	-	-	-
	NL-4	Close-up lenses +4 diopters	+	-	-	-	37 - 77	-	-	-
	NL-5	Close-up lenses +1 diopters	+	-	-	-	37 - 77	-	-	-
Macro Lens	Macro	Close-up lenses +10 diopters	+	-	-	-	49, 52, 55, 58	-	-	-
Soft Filter	S-P	B+W Soft Pro	-	-	-	-	37 - 95	-	-	-
Effect Filter	684	Star effect 4x	-	-	-	-	49 - 77	-	-	-
	686	Star effect 6x	-	-	-	-	49 - 77	-	-	-
	688	Star effect 8x	-	-	-	-	49 - 77	-	-	-

*XS-Pro exclusive with MRC nano coating

+ = Filter is available
- = Filter is not available

MRC = Multi Resistant Coating, on both sides
E = Single coating, on both sides

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