

Photography filters

Color correction. Tonal control. Better decisions before exposure.

COLOR & BLACK AND WHITE



A filter changes the light before it reaches the film or sensor. In color photography, that can mean correcting a color cast, controlling reflections or reducing exposure. In black-and-white photography, colored filters change how subject colors become shades of gray. Choosing the filter is a creative decision; compensating for the light it absorbs is an exposure decision.

16 illustrated filter types • Mounting systems • Exposure factors

01 / QUALITY

Good glass deserves a good filter

Why good lenses deserve good filters

A filter becomes part of the optical path. Poor flatness, uneven glass, unwanted tint, surface contamination and reflections can compromise a good lens. The damage may appear as flare and reduced local contrast rather than obvious softness. Bright windows, the sun near the frame and night lights are useful stress tests. An expensive lens cannot undo stray light introduced by a poor filter. B+W is all I use.

What multi-coating actually does

Every air-to-glass surface reflects some light. Thin anti-reflection layers use optical interference to reduce those reflections. A multi-layer design works over a broader range of wavelengths than a simple coating, helping preserve contrast and suppress ghosts. B+W calls its system MRC, or Multi Resistant Coating; MRC nano also emphasizes easy cleaning. Water- and oil-repellent top layers are useful, but they are not the same function as anti-reflection layers.

Coatings do not cancel filter factors

A coated red filter still needs to absorb selected wavelengths, and a coated ND still reduces exposure. High transmission claims describe the relevant passband or coating performance, not a promise that every filter passes almost all incoming light. More advertised layers do not, by themselves, prove better performance. Judge optical quality, neutrality where intended, durability and flare resistance.

Does every lens need a protective filter?

A quality clear or UV filter is useful around salt spray, dust or blowing sand. In clean conditions, using only a lens hood is also reasonable. Even excellent filters can produce ghosts around strong point light sources. Remove the protective filter before adding an effect filter when practical, and avoid unnecessary stacking.

02 / MANUFACTURERS

Which brand is best?

B+W is my preferred premium screw-on choice. No single brand wins every filter category.

B+W / Schneider-K reuznach

My preferred premium screw-on choice

Excellent choice when you value durable mounts and high-quality coatings. Select the exact model and coating; older used filters may be uncoated or single-coated. Current monochrome names include Y475, O550 and R610.

Hoya

Broad screw-on selection

Offers multiple product tiers and color-correction options. Compare the actual coating and mount specification rather than assuming all Hoya filters are equivalent.

Tiffen

Traditional color and creative filters

A useful source for numbered color-conversion filters, monochrome contrast filters and diffusion. Product-specific factors make identification especially important.

LEE Filters

Graduated and modular systems

A strong option for photographers who need to slide a graduated filter to match the horizon. Offers adapters, holders and different filter materials.

NiSi

Modern landscape systems

Worth considering for a coordinated holder, polarizer and ND setup. Match the holder to the lens and required filter size.

Cokin

Creative holder systems

Offers adapter-based systems and both resin and glass ranges. Its different ranges should not be treated as one uniform optical specification.

Buying advice: compare the exact model, coating, mount and filter type.

03 / MOUNTING

Screw-on or slide-in?

Screw-on filters

A round filter threads directly onto the lens. Match the diameter marked with the diameter symbol, such as 52 mm or 77 mm; this is not the lens focal length. Screw-on filters are compact and convenient for handheld work. Their drawbacks are repeated threading, possible binding and the cost of different sizes.

Step-up rings

A 52-to-77 mm step-up ring lets a 52 mm lens use a 77 mm filter. Buying for your largest commonly used thread can save money. Check hood and cap fit. Step-down rings place a smaller filter in front of a larger lens and can vignette. Even step-up arrangements need a corner check on very wide lenses.

Adapter ring + holder + slide-in filter

The adapter attaches to the lens, the holder attaches to the adapter, and square or rectangular filters slide into slots. A graduated filter can move vertically and rotate with the holder. One set can serve several lenses through different adapters. The tradeoffs are bulk, handling, exposed surfaces and possible light leaks during long exposures.]

Glass, resin and compatibility

Good optical resin can perform well and is light, but scratches more easily. Glass can be durable at the surface yet break when dropped. Neither material name guarantees quality. Check width, thickness, slot fit, light seals and wide-angle coverage. A magnetic round system speeds changes but does not provide the positioning freedom of a rectangular grad.

04 / EXPOSURE

Filter factors made practical

2x

+1 stop

4x

+2 stops

8x

+3 stops

16x

+4 stops

Read factors correctly

A 2x factor means twice the exposure, or +1 stop. A 4x factor is +2 stops; 8x is +3; 16x is +4. Stops = $\log_2(\text{factor})$. Factors multiply when stacking ordinary filters, while their stop losses add. With strong colored filters, overlapping transmission bands can make the simple product only an approximation.

With an incident or separate meter

Meter without the filter, then add the stated compensation. At 1/125 second and f/8, a 4x filter calls for approximately 1/30 at f/8, or 1/125 at f/4. Keep the film speed unchanged, or deliberately lower the meter ISO by the factor; do not do both. ISO 400 divided by 4 gives a meter setting of ISO 100.

With through-the-lens metering

A TTL meter sees the filtered light and often compensates automatically. Do not blindly add the full filter factor again. Strong red, orange or blue filters can mismatch a meter's spectral response. Test your camera and film, or use an unfiltered incident reading plus the maker's factor. Bracket important work.

Why factors vary

Colored-filter factors depend on the filter's spectral transmission, film sensitivity and light source. A red filter may cost more light under a blue-rich sky than under warm illumination. Numbers in this guide are typical starts or explicitly identified product examples, not universal values for every filter of that color.

Correct the light before exposure

Start with the film balance

Film has a fixed nominal color balance. Daylight film is commonly balanced near 5500 K; tungsten film is often balanced near 3200 K. A blue conversion filter helps daylight film under tungsten light, while an amber conversion filter helps tungsten film in daylight. Filtration removes selected light; it cannot supply missing wavelengths. Extra exposure by itself does not correct a color cast.

Color negative, slide film and mixed light

Color negative film often allows substantial correction during scanning or printing, but filtration can improve the balance recorded in the negative. Slide film offers much less room for later correction. In mixed daylight and tungsten, one lens filter changes both sources: choose the dominant light, accept a creative difference, or correct the lights themselves. LEDs and fluorescent lamps may have uneven spectra that Kelvin alone cannot describe.

Conversion versus balancing

80 and 85 families make larger daylight/tungsten conversions. Pale 81 and 82 filters make smaller warming or cooling adjustments. Their temperature shift is not a fixed number of Kelvin at every starting temperature; technical matching uses mired shift.

Special correction families

Color-compensating (CC) filters are available in cyan, magenta, yellow, red, green and blue, in multiple densities. They fine-tune casts or measured spectral imbalances. There is no single CC factor: use the exact color/density data. A skylight 1A or 1B is a very mild warming/UV filter, typically near 1x, rather than a full color-conversion filter.

06 / COLOR ATLAS

Conversion filters

Listed factors are reference examples. Confirm your film and filter instructions.



80A / blue conversion

4x / +2 stops

Use daylight-balanced film under approximately 3200 K tungsten illumination. The blue filter reduces the orange cast by attenuating warmer wavelengths.

A household lamp may be warmer than 3200 K. An 80A is not a universal correction for LEDs or mixed lighting.



80B / blue conversion

3x / +1.6 stops

Use daylight-balanced film under approximately 3400 K photoflood lighting. It is a weaker correction than an 80A.

This is the Tiffen reference factor. Other product listings differ; use the instructions for the filter in your hand.



85B / amber conversion

1.6x / about +2/3 stop

Use 3200 K tungsten-balanced film in approximately 5500 K daylight. The amber filter reduces the blue cast.

85 and 85B are different strengths. Follow the film data sheet: some tungsten motion-picture stocks specify an 85.

AI-generated representative filter illustrations; not product photographs or calibrated color swatches.

07 / COLOR ATLAS

Balancing and correction

Small color shifts still require attention to exposure.



81A / mild warming

About 1.3-1.4x / +1/3 to 1/2 stop

Adds modest warmth to color film in cool illumination, such as open shade. Useful when a slight warming effect is preferable to neutral color.

81B and 81C are progressively stronger warming options. Their factors are not automatically identical to 81A.



82A / mild cooling

About 1.3x / roughly +1/3 stop

Provides a small cooling correction. A standard example is matching approximately 3000 K illumination to 3200 K tungsten film.

82B and 82C make stronger corrections. These pale-blue balancing filters do not replace an 80A for full tungsten-to-daylight conversion.



FL-D / fluorescent correction

Variable; often 2-4x / +1 to 2 stops

A magenta-toned filter intended to reduce the green cast of certain fluorescent lamps when using daylight film.

Lamp spectra vary. FL-D, FL-W and FL-B serve different lamp/film combinations. Test the exact pair; do not assume an FL filter fixes modern LEDs.

08 / MONOCHROME

Color becomes tone

Think in subject colors

On panchromatic black-and-white film, a filter generally makes its own color relatively lighter and opposing colors relatively darker in the final positive image. It changes tonal separation, not the development contrast of the entire negative. A red flower and green leaf that originally print as similar gray can separate dramatically when you choose which wavelengths to transmit.

Avoid the contrast shortcut

A colored filter can increase separation between two colors and decrease it between two others. It does not simply make every photograph more contrasty. Look for a specific relationship you want to change, then select the filter.

Know the film

These rules assume film sensitive across the visible spectrum. Orthochromatic film is not red-sensitive: a strong red filter can block nearly all usable light. For infrared effects, pair an appropriate IR filter with a compatible film or converted camera; there is no universal IR factor. Ordinary black-and-white film does not become infrared film when a dark red filter is attached.

B+W naming note

B+W now lists Y475 yellow, O550 orange and R610 red filters. Older filters may use numerical codes such as 022, 040 or 090. Do not assume that a current name and a legacy code have identical transmission or factor. Consult the exact model documentation.

09 / MONOCHROME ATLAS

Yellow, yellow-green and green

Factors refer to specific examples or light/medium filter classes.



Yellow / general monochrome

Typical medium yellow: 2x / +1 stop

A practical first filter for panchromatic black-and-white film. It darkens blue skies moderately and helps clouds separate.

Yellow subjects become relatively lighter. Pale and deep yellows differ. A colored filter cannot create cloud detail in a featureless white sky.



Yellow-green / tonal separation

Tiffen #11: 4x / +2 stops

Useful for foliage and outdoor portraits when you want to alter the relationship between greenery, skin and surrounding colors.

Other yellow-green products can have different factors. Judge the subject colors rather than treating it as an automatic portrait improvement.



Green / foliage and skin

Light green: about 2x / +1 stop

Lightens green foliage relative to red subjects. It can separate leaves from red flowers and make reddish skin detail more prominent.

This value describes a light green filter, not every green. Dense green/tricolor filters can require substantially more exposure; consult their data.

AI-generated representative filter illustrations; not product photographs or calibrated color swatches.

10 / MONOCHROME ATLAS

Orange, red and blue

Greater spectral selectivity can make meter errors more significant.



Orange / stronger sky separation

Typical: 4x / +2 stops

Darkens blue skies more strongly than yellow while lightening orange subjects. Useful for architecture and dramatic landscapes.

Reddish brick may become lighter. Blue shadows may darken. Check the resulting relationships rather than assuming all contrast increases.



Red / dramatic monochrome

Tiffen #25: 8x / +3 stops

Strongly darkens blue skies and lightens red subjects. It can create bold separation between white clouds and a blue sky.

Red filters vary widely. Do not transfer this #25 factor to B+W R610 or an older B+W red. Never assume an orthochromatic film will respond normally.



Blue / haze and atmosphere

Light blue: about 2x / +1 stop

Lightens blue subjects and makes haze more apparent. Darkens warm colors, often emphasizing freckles and skin texture.

The example is a light blue filter. Dense blue separation filters such as #47 need their own much larger exposure correction.

AI-generated representative filter illustrations; not product photographs or calibrated color swatches.

11 / COLOR + MONOCHROME

Control reflections and exposure

These filters are useful with either color or black-and-white capture.



Circular polarizer / CPL

Often 2-4x / +1 to 2 stops

Controls reflections from water, glass and foliage and can deepen a blue sky. Useful with both color and black-and-white capture.

Rotate while looking through the lens. Effect depends on angle; a wide-angle sky can become uneven. It does not reliably remove metallic reflections.



Solid neutral density / ND

Example: ND 0.9 = 8x / +3 stops

Reduces light across the whole frame, allowing a slower shutter speed or wider aperture. Useful with both film and digital cameras.

For long film exposures, apply the film maker's reciprocity correction after calculating the filtered exposure. Dense filters can reveal color casts.



Graduated neutral density / GND

Example: 0.6 = 4x / 2 stops in dark area

Reduces brightness in part of the scene, commonly a bright sky above darker land. Slide and rotate a rectangular grad to place its transition.

There is no single whole-frame factor. Meter the foreground and compare the sky. Mountains, trees or buildings can reveal an unnatural darkened edge.

12 / SHARED TOOLS

Protection, ND and special effects



Clear / UV / protection

Approximately 1x / 0 stops

Clear filters provide a cleanable barrier against spray and grit. UV filters also absorb ultraviolet light, which can matter with some films and conditions. UV filtration is usually unnecessary for digital image quality. A good hood remains useful; remove the filter if point lights cause ghosts.

ND numbers: three different labels

ND 0.3 = 2x = 1 stop; ND 0.6 = 4x = 2 stops; ND 0.9 = 8x = 3 stops; ND 1.8 = 64x = 6 stops; ND 3.0 is approximately 1000x = 10 stops. Optical density, exposure factor and stop count are different ways of stating strength.

Variable ND and diffusion

A variable ND uses polarizing elements and has a range of attenuation rather than one factor. Near its limit it can produce uneven density or an X pattern. Diffusion, mist and star filters alter highlights and detail; exposure loss varies by product and strength. A diffusion grade such as 1/4 is not an exposure factor.

Infrared is a separate workflow

An IR-pass filter such as a 720 nm type can look nearly opaque. Exposure depends strongly on film or sensor sensitivity and illumination. Use a compatible capture medium, its published guidance and testing; a universal factor would be misleading.

Build a kit. Then test it.

Build a small kit

For black-and-white film, start with yellow, then add orange or red for stronger sky separation and green for foliage. For color film, buy correction filters for the film and lighting you actually use. A CPL and a suitable ND are useful across both. My premium screw-on preference is B+W; my holder choice would depend on lenses, grad positioning and system compatibility.

Make a useful filter test

Choose a scene with blue sky, clouds, red and green subjects, and stable illumination. Make an unfiltered reference, then expose each filtered frame with its correct compensation. Record film, light, filter code, meter method and settings. Keep development and scan settings consistent; automatic scan corrections can hide the differences.

Clean and store carefully

Blow off grit before wiping. Use a clean lens cloth and an appropriate cleaning fluid, following the maker's instructions. Hold filters by their edges, avoid overtightening and store them separately. Check used filters for haze, scratches, separation and damaged threads.

For digital black-and-white

On a standard color digital camera, capture RAW in color and use a black-and-white mixer for flexible tonal control. Physical colored filters throw away light and channel information. A dedicated monochrome sensor is a different case: physical filters are a key tonal-control tool. Polarizers, ND and grads remain useful optical tools with digital capture.

14 / SOURCES

References and image notes

Manufacturer and film-maker guidance checked September 29, 2026.

01 ILFORD: Using colour filters for black and white photography

[Open manufacturer reference](#)

02 B+W: Current black-and-white filters

[Open manufacturer reference](#)

03 B+W: Coating systems

[Open manufacturer reference](#)

04 LEE: LEE100 system

[Open manufacturer reference](#)

05 Cokin: Filter ranges and adapter systems

[Open manufacturer reference](#)

06 Tiffen: 80A conversion

[Open manufacturer reference](#)

07 Tiffen: 80B conversion

[Open manufacturer reference](#)

08 Tiffen: 85B conversion

[Open manufacturer reference](#)

09 Tiffen: 81A balancing

[Open manufacturer reference](#)

10 Tiffen: 82A balancing

[Open manufacturer reference](#)

11 Tiffen: Film enhancement guide

[Open manufacturer reference](#)

12 Tiffen: Green #11

[Open manufacturer reference](#)

13 Tiffen: Red #25

[Open manufacturer reference](#)

14 B+W: Clear and UV filters

[Open manufacturer reference](#)

15 Hoya: Color correction range

[Open manufacturer reference](#)

16 NiSi: Choosing a filter system

[Open manufacturer reference](#)