

Notes on Filters.

I don't have decades' worth of experience with tons of different filters, so take my comments with a proverbial grain of salt. However, I've bought a modest set - new and used - and I've done a lot of research on the topic. This is what I've learnt, written up as an opinionated editorial in case anybody finds it interesting.

And remember, that's basically all this is. Opinions. I haven't sat down with a pile of complex optical testing equipment with a stack of filters from different manufacturers, trying to determine objectively what's the best stuff out there. Nobody has, I'm sure. Even if you did test a fair range of products you'd need to test several samples of each one, as a sample size of one doesn't tell you much. So, sure, I've done little home tests by shooting with various filters under mildly controlled conditions (same lens, camera, tripod, scene, etc) in order to satisfy my curiosity. But that's as far as it goes. I don't pretend to be offering some utterly unbiased data here.

I'm also someone who doesn't have a limitless budget. I try to avoid total junk, but spending massive sums on luxury filters isn't a reasonable option for me. (\$250 US for a Leica polarizing filter? I don't think so) If you've got thousands of dollars to spend on a filters then this page is not for you.

Photo.net has a [useful writeup](#) on the topic of filters. Perhaps the most important point the page makes is that it's easy to get carried away with goofing around with filters, but ultimately stuff like image composition is a lot more important. Another useful, albeit extremely lengthy, resource is Robert Monaghan's [filter page](#), though I don't entirely agree with his opposition to protective filters.

To buy a protective filter or not?

The perennial question. Plain clear glass, ultraviolet (UV) and warming filters are sold as protective filters to help reduce the risk of lens damage. And camera shops frequently push such filters onto unsuspecting consumers, often at a highly profitable markup, often warning the buyer of the dreadful risks of not using such a filter.

Plain glass filters are just that - transparent pieces of optical glass which are not designed to cut out any light and thus have solely protective value. UV filters, on the other hand, pass visible light but filter out ultraviolet energy of a certain range, and so are good for cutting through some haze in landscape shots. They're not magic or anything - they can't eliminate atmospheric haze from photos. They simply reduce some of the bluish fuzz on film which is caused by solar UV energy which humans can't see but which film records as blue. Since they're clear and cut no other forms of energy out people often just leave them on their camera lenses all the time.

Skylight or warming filters (81A, etc) have a slight yellowish tinge that warms up landscapes (cuts back some blue light) when there's a lot of blue light. They may or may not cut UV light as well.

As for the protective aspect, the theory is very simple. If you turn around and bash your camera against a doorframe, would you rather have the exposed

front element of your expensive lens get crushed? Or would you rather have your considerably less expensive filter get smashed? Or if you're shooting photos at the beach and get sea spray blown in your face, wouldn't you prefer having the salt crud coat your filter rather than your nice lens? (Lens hoods perform a similar function. In addition to shielding your lens from stray light, thereby increasing colour saturation and contrast and reducing flare, lens hoods provide a simple physical level of protection for your lens by sticking out in front.)

Filter detractors argue that any filters, no matter how high quality, clean and multicoated, are extraneous and will invariably reduce image quality. Which is undoubtedly true. The question is, will you notice it? I haven't noticed any particular image degradation caused by filters, but then perhaps I simply lack the highly-refined, well-trained and hawk-eyed visual acuity to notice the shocking drop in image sharpness.

My conclusion? Well, I'm not a professional photographer. I can't justify great expenses by the argument that my livelihood depends on it, because it doesn't. I'd rather not see my investment in lenses ruined by accidents if I can avoid it, and so I use UV filters as both lens protection and filter thread protection. I also try to keep a lens hood on the lens at all times - for both light-shielding and lens-shielding reasons. If I'm taking a photo in a slow leisurely context I might take off the UV filter, but it's been pretty rare that I've noticed any problems caused by my use of filters.

In fact, I can only think of two occasions where filters turned out to be a problem. Once I stupidly forgot to remove a polarizer whilst trying to take photos in low light, which made things much worse since polarizers cost a stop or so of light. And once I used an uncoated rectangular filter on a long telephoto shooting a brightly-lit neon art piece at night. I got faint spurious reflections of the piece appearing on the image, caused by light bouncing off the filter. Ouch.

The key, it seems to me, is to have a reasonable quality filter and to keep the damned thing clean. Sticking a protective filter on your lens and then letting it get thumbsmudged and filthy isn't going to do anything for the quality of your photographs. A bit of dust isn't a huge deal, but fingerprints can cause noticeable quality loss. Neither is buying a generic, cheaply made filter pushed on you by a greedy salesperson - putting a \$5 filter on a \$500 lens seems rather counter-productive. Another point to remember is that filters are flat and lens front surfaces are often curved, so filters are easier to clean.

Whatever you do, don't get paranoid about always keeping the "protective filter" in place at all times. It doesn't have to be. And don't stack a polarizing filter on top of a cheap UV filter - you're just risking vignetting and degraded image quality.

To buy a polarizer or not?

Polarizing filters are used for reducing reflections in photos and boosting contrast. They work by letting you selectively filter out light that's polarized along certain axes. The end result is you can enhance blue skies and blue oceans/lakes - darkening them - and cut back reflections off non-metallic surfaces such as glass and water.

Polarizers generally consist of two glass surfaces, to which are laminated thin sheets of plastic polarizing material. The two surfaces are mounted in separate rotating rings, so you can turn the filter to adjust the strength of the polarizing effect. Polarizers are thus thicker than normal filters, and increase the risk of vignetting (darkening of the corners) caused by blocking the light which enters the lens.

There are two types of polarizing filter. Standard linear polarizers work only with older manual-focus cameras. Newer [circular polarizers](#) have an additional thin sheet of material - quarter-wave - which lets the filter work properly with autofocus and newer auto-exposure cameras. Some people don't like circular polarizers, as the visual effect is subtly different from linear polarizers. But if you have a newer SLR, you don't have much choice.

I like polarizers for boosting the blueness of skies and increasing the contrast against white clouds. Though of course you can overdo it and get a tacky postcard sky look. Polarizers also cost you a stop or so of light, so you won't want to use one in low-light conditions. Some people don't like polarizers because there are so many surfaces involved - the glass filters plus the plastic laminates - and this can cut down image quality.

Finally, you have to be aware that the polarizing effect varies depending on the sun's angle in the sky. You can view this effect directly by panning an SLR with a polarizer across an open blue sky - you'll notice at some points the polarizing effect is very pronounced, and at other points it's quite weak. If you have a really wide-angle lens (say 20mm or wider) you'll notice an uneven polarization effect across the sky as a result. Whether this detracts or not from your image is your call.

Coating or not?

Nearly all lenses sold today for 35mm SLRs are multicoated to reduce internal reflections. This is pretty critical for image quality - particularly contrast and flare. Some filters are monocoated, some are multicoated, and some aren't coated at all.

The argument in favour is pretty straightforward. You've got coated lenses - why spend money on putting uncoated glass in front of them? Regular filters mean you're putting two reflective surfaces in front of your lens. Polarizers have four. Surely you should go for the best image quality and get coatings.

The arguments against are that coated filters are harder to clean and easier to scratch. These are both demonstrably true. Fingerprints show up much more easily on coatings, and getting that fine layer of greenish shimmering finger oil off a coated surface can be a real pain. And some coatings are indeed easy to scratch. I had this happen to an expensive Hoya multicoated polarizer - it rubbed against something in my bag, scraping off the fine coating layer, rendering the filter useless. (B+W have a line of coated filters that are allegedly treated for hardness to reduce this danger, but they're massively expensive and I haven't got any of them.)

Personally I go for multicoated filters for the most part. I have a few single-coated filters - ones I rarely use, but I don't have any uncoated ones except for a couple second-hand \$1 cheapie effects filters. I buy the "reduce

reflections" argument. I've had a few pictures suffer from lens flare - one from a really bad internal reflection - caused by uncoated filters. As for cleaning, yes. It is a pain. But keeping your lens clean is important for image quality regardless. And I try to keep the filters in their cases when they're not being used to minimize the chances of coating damage.

Aluminum or brass rings?

All the filter mounting rings I've ever seen have been made of metal - aluminum or occasionally brass. B+W and Heliopan use brass rings and just about everybody else use aluminum.

So which are better? B+W's literature claims that brass rings are preferable since they don't bind to aluminum lens threads, unlike aluminum, which tends to bind to itself. This may well be true. So if you have a big investment in older metal lenses, this may be something to consider. However, if you're like me and most of your lenses are modern cheapie lenses with polycarbonate plastic filter threads, I find it's pretty well a non-issue. Brass also expands less than aluminum when heated, so this apparently can also be a factor - less likely to get stuck on the lens when it's warm.

Hoya, on the other hand, claim that aluminum is superior since it's softer and deforms more easily. As a result, if you bang your lens the filter ring will deform and absorb the blow. It may then be useless, but at least your filter valiantly sacrificed itself to protect your expensive lens.

Which is true? I don't know - those arguments all sound reasonable to me. However, B+W and Heliopan filters are hugely expensive. I've never had any problems with aluminum filters binding, so I'm sticking with them. So to speak.

Slimline or regular rings?

If a filter ring is too deep (sticks out too far) it'll block some of the light coming into the edges of the lens. This darkens the corners - an effect known as vignetting. It's particularly a problem with wide-angle lenses; less so with telephotos. For this reason you can buy slim filters, which usually lack front threads, to avoid the problem. The downside of course is that you can't stick a regular lens cap on the end of the filter, since there aren't any front threads. Slim filters also tend to be really expensive.

I generally haven't noticed a problem with vignetting caused by normal filters, even with polarizers on a 20mm wide-angle lens. (Polarizers are more likely to vignette, since they have to be deeper to accommodate the two rotating layers) However, I never stack filters - put on, say, both a UV and a polarizer at the same time. This is a surefire recipe for vignetting on wider lenses.

Generally beginning photographers read about this vignetting problem and worry a lot. I'd say don't worry. Get a decent filter and try it out. Chances are it won't vignette unless you have a really wide-angle lens.

Glass or plastic?

Most round (screw-on) filters are made of glass. All things being equal, good glass is of higher optical quality than the best resin - I've read this has

something to do with the size of polymer molecules or something, but I'm hardly an expert and this could be bogus. Nonetheless, it's obvious that plastic scratches much more easily than glass.

However, there are grades of glass. For instance, some filters are made with regular cheap green glass of the type used in making windows. If you look at this type of glass from the edge you'll notice a distinct greenish tinge caused by iron compounds in the glass. Better quality glass is clear when you look at it from the edge. This includes "water" glass, which is clear and not green and true optical glass, which is very transparent and pure glass. Unfortunately there doesn't seem to be any accepted universal standard as to what constitutes true optical glass and what doesn't, so you sort of have to trust the manufacturer's word.

I don't own any round plastic filters. I do own a couple of rectangular slot-in filters for the Cokin P filter system, since I can't justify the expense of big rectangular glass filters given how rarely I use them.

Other types of filters.

There are tons of filters out there for creating various effects. Here are a few:

- Coloured filters for black and white photography. By putting filters of different colours in front of your lens you can achieve certain types of effects when using black and white film. Red filters, for example, are commonly used for darkening blue skies on most black and white films. Orange and green filters are also sometimes used. I have Red 25 filters which I use for black and white and infrared photography.
- Colour-correction filters for colour photography. These are filters used to compensate for lighting conditions. For example, a skylight filter is a popular filter used for landscapes. They add a slight warming tone to an image (they're subtly yellowish or slightly straw-coloured filters) and so cut out some of the blue light in landscapes, particularly at high altitudes. There are also more extreme colour correction filters for using daylight balanced film with tungsten light and tungsten balanced film with daylight. I actually have information on this topic on a different page - my [flash photography](#) article. Have a look at the sections on [colour temperature theory](#) and [colour filters](#).
Note that filters work by taking certain wavelengths of light *out* of an image. They don't add anything. So if you're trying to take a photo under, say, a mercury arc light with its weird spectrum of light output, you can't do much to alter the colour balance of the photo by using a filter. You can't take the light in an image and move it over along the spectrum, as it were. For that you have to do stuff after the fact. Electronic image processing - using Photoshop or whatever - is probably the simplest way, though there are darkroom tricks.
- Colour-tint filters for colour photography. You can buy filters to tint whole pictures various lurid shades. So if you want to simulate sunset you can stick a tobacco filter in front of your lens. Or whatever. A lot of these are sold as resin filters for use with Cokin filters. Alternatively, some firms sell super-thin gel filters, which are said to be of higher quality than thick resin filters. They're also very fragile and easily scratched or ripped. I've never used them

myself.

- Neutral-density filters. These simply darken the image by letting less light through, but don't (or shouldn't, anyway) alter the colour balance in any way. If you happen to have really fast film in your camera and suddenly find yourself outside on a sunny day you might want one. Or perhaps you want to set a really long exposure time in regular light - maybe to take a photo of a waterfall but with a super-slow shutter speed, in order to get that ghostly curtain-like blurring effect of the moving water.
- Soft filters. These filters can have circular depressions (eg: Zeiss Softar) or embedded netting (basically a glorified way of putting nylon stocking over the end of your lens, only without any threat to your masculinity if you're an insecure male photographer) or whatever. The end result is a softening of the image, like an old lens with really bad spherical aberrations. Used for allegedly romantic photos of lovers, or for portraits of older people who want to make their wrinkles less obvious. Soft focus isn't merely the same as being out of focus - stuff is still in focus, just softened. Contrast is decreased and there's a glow-like halo.
- Starburst filters. These are simple glass filters with crosshatched lines engraved into them. They cause a slight softening of the image, but more importantly cause the starburst effect to appear around bright light sources like streetlights and so on. The effect can be interesting, but can also be a bit tacky (think Tom Jones on a 1975 TV special in Las Vegas or something). You can get different line patterns, for four-point, six-point, etc, stars.
- Multi-image filters. These are basically sort of prisms you stick in front of your lens that break up the image into one central image surrounded by however many (4 is common) replicas. Tacky effect from the 70s. It can be a [lot of fun](#). (note that since the prisms are single wedges of glass there's no correction for chromatic aberration, which leads to noticeably fuzzy images around the central image.)
- Other massively tacky filters. Cokin is the world leader in tacky filters. Basically if you want to get a filter that adds a sparkly diffraction pattern, or simulated motion blur, or heart-shaped cutouts, or whatever, Cokin will be happy to serve you.

Buying a filter.

I'd probably just go to [B&H](#) in New York. Or at least their Web page. Local camera stores unfortunately seem to mark up their filter prices quite a bit. Probably with reason - their operating costs are much higher than a big discount place like B&H. However, I would ask your local camera shop if they have any second-hand filters lying around. Most do (my local store has most of theirs screwed together into a long rod!) and you can often find great deals by buying a grubby fingerprinted second-hand filter that cleans up to a nice unscratched brand-new looking one.

But I'd be careful if you do purchase filters from your local camera store. For some reason there seems to be a big markup on filters, and salesdroids are eager to push junk filters on you for too much money. A common sales tactic

when selling new cameras is apparently to throw in a protective UV filter and bury it in the price of the whole package. Check this sort of stuff out carefully, as it's unlikely to be in your best interests. In particular, I wouldn't buy any no-name filter, no matter what assurances your salesrobot may offer. ("Why yes - this is actually a top-notch *Nikon-made* filter - it just happens to be sold under the SoopaPhilta brand name!")

I do not recommend the [Filter Connection](#) at all, though their Web site does have a bit of useful information tucked away amidst the typographical errors. Last year I ordered a filter kit from them that took ages to ship and which cost a lot to boot. When I called for tracking information and the like because of the delay they were singularly unhelpful and verging on rude. (it's not our fault - end of story) It was doubly frustrating for me at the time because I needed the filter for a photo shoot in the desert and ended up having to go without. Since I'm not interested in paying hefty surcharges for unprofessional behaviour I'm not going to buy from them again.

B&H do have that New York City curtness to them when you talk to them on the phone, but they do seem pretty honest and responsible nonetheless. Like, they actually make an effort rather than just passing the buck.

A few filter makers.

Lots of firms make filters. I own a few filters made by a few of them and have looked at others in shops. Here are my remarks, representing purely my small sample size. I'd visit your local camera shop and have a look at some of this stuff before making your own purchasing decisions.

B+W.

[B+W](#) is the filter division of German optical maker Schneider. Their products are renowned for high quality, and priced to match. Accordingly, I don't own a lot of B+W filters.

Their main claims to fame are 1) high quality Schott optical glass, 2) they use brass rings (see above), 3) they deliberately mount the glass loosely in the ring so as not to stretch and distort it, 4) they polish their filters to guarantee flatness, and 5) they possess that fine Teutonic aura of *Qualität*.

As noted, their stuff is very expensive. The B+W merchandise I own is unquestionably nice, but I can't say my pictures taken with it look any better than the ones taken with my Hoya filters. B+W were rather late to the multicoating game, so most of their stuff is only monocoated. Only their super-expensive products are multicoated.

Cokin.

Feeling nostalgic for the 1970s? Pining for those wonderful romantic days of cheesy, overblown filter effects? Romantic soft focus! Delightful sparkly cross filters! Moody colour filters! Trippy multi-images, man! Wow! Well, these effects and more can be yours, simply by buying little squares and rectangles of plastic from France!

[Cokin](#) specialize in this sort of cheesy filter stuff. They have a huge catalogue of tacky filters, which come in a variety of sizes. Frankly I have no use for the

things. If I want cheesy effects I'm not going to go and spend a ton of money on an overpriced piece of plastic. I'll just scan my negative, put it into Photoshop and crank up the cheese. (admittedly this wasn't possible 30 years ago, but the wonders of technology never cease)

The only Cokin product I have is one of their type P filter holders, which is a rectangular filter holder designed for wider-angle lenses. (their normal filter holder (type A) doesn't work with wide-angle lenses - it tends to vignette.) I have this filter holder, along with a HiTech graduated neutral density resin filter, for landscape shots. If you're taking a photo of a sky or a sunset or whatever, you have the traditional problem of the sky being much darker than the ground. If you meter for the sky then the ground will be too dark and black and if you meter for the ground then the sky will be too light and blown out. If you stick a graduated neutral-density (darkening) filter on your lens, however, you can darken the sky artificially to compensate. Film doesn't have the dynamic range of the human eye and so this sort of mucking around is sometimes necessary.

Note that I don't own a Cokin grad ND filter. This is simply because they don't sell any. They only sell a grey filter, which apparently tints the image slightly. So I went for the HiTech filter, which is allegedly true neutral-density. I did buy one Cokin filter, though - a tobacco-coloured graduated filter, to experiment with tinting skies and such. It's cute, but way too obvious an effect most of the time, I find.

Finally, the Cokin P holders is well known for vignetting with wide-angle lenses. To use this holder on a 20mm Canon lens I sawed off the outer two slots with a hacksaw. If you don't do this you'll find a lot of vignetting on the edges caused by the black plastic holder itself.

Hoya.

Hoya are a division of [THK](#) - Tokina Hoya Kenko, the large Japanese maker of third-party optical equipment. They sell a wide range of filters. I'm not terribly impressed by the Tokina lenses I've used or examined, but Hoya's filters seem pretty good for the price. Hoya is also one of the world's biggest makers of optical glass.

The Filter Connection's page claims that the rock-bottom line of Hoya filters (Excel Green Series) use green glass, like the stuff from Tiffen. The other filters they manufacture - with HMC and SMC multicoatings - use clear optical glass. Their filters all use aluminum rings, and Hoya claims to grind and polish their filters for flatness - though I don't know if this applies to their entire range.

I've had pretty favourable results with their products, for the most part. Their coatings seem to work quite well. The only problem I've had was with an SMC polarizer. The first one I bought seemed to be poorly made - the plastic laminate wasn't glued right to the edges, and reflected light around the edge of the ring. I wasn't happy with it, so I sent it back to B&H, where I bought it. They sent a replacement which, whilst still having a bit of roughness around the edges, seems okay. I can definitely see why B+W vaunt their Kaesemann sealed polarizer technology.

From my limited experience, I'd say Hoya's standard multicoated filters (HMC) seem to offer reasonable quality for reasonable cost. If I had lots of money to throw around I might get fancier stuff, and I do own a couple Hoya SMC filters, but reality sets in at a certain point. There's no way I'd buy a green line Hoya filter - the cost savings and minimal and I don't see the point of using non-optical glass.

Sunpak.

I own one filter sold by [Sunpak](#), the flash and accessory division of ToCad, the Japanese (I think) camera accessory firm. It's a 72mm red 25 filter, and appears identical to the Tamron-branded 58mm red 25 filter I own. The only difference is that one has the Sunpak logo on it and one the Tamron. Everything else about the two filters (other than size, obviously) is identical - even the printing on the ring.

My filter seems reasonable enough. Only monocoated, but it was very cheap. I don't do that much black and white photography, so it was a good buy for me. That's all I know about them, which I realize is like drawing a curve from a single point. But Sunpak aren't really a major seller of filters anyway.

Tamron.

Tamron, the large Japanese third-party lens manufacturer, also sell filters. I don't know who actually makes them - it's possible someone like Hoya does, and they simply repackage them. (I say Hoya since I've noticed that the generic printed instruction sheets supplied with the Tamron filters look almost identical to the Hoya ones)

I own a few Tamron filters include a red 25 filter, a linear polarizer for a manual focus camera. They appear decent enough, though they look monocoated and not multicoated. The ones I own seem decent value for the money if you're on a tight budget.

Tiffen.

Tiffen, an American manufacturer, sell an extensive range of general photography products acquired over the years - from Steadicam camera rigs to Barbie-branded toy cameras to Domke camera bags - though they are best known for their filters. Unfortunately I can't recommend their filters as they apparently do not coat the majority of their still photography (as opposed to movie photography) products, according to the information page at the Filter Connection Web site. I personally feel multicoating is of benefit to filters - uncoated filters are just too mirrorlike for me. The Filter Connection also claim that Tiffen do not use optical glass to make their still photography filters, which is also discouraging if true. The Tiffen filters I've seen and used have tended to have very thick metal rings (the slimline/wide angle models notwithstanding).

They also laminate their coloured filters. For instance, instead of using glass which has been tinted red to make their red filters they sandwich a thin red gel between two pieces of glass. Does this matter? Maybe; maybe not. After all, all polarizing filters are made this way. But I've seen polarizers delaminate over time, so I'd like to avoid this filter construction method when it's at all

possible.

Note that although Tiffen filed for US chapter 11 bankruptcy protection in February 2003 they are still in operation as a company.

Other filter makers.

You'll notice I don't remark on super-expensive filters made by, say, Heliopan or Singh-Ray or Lee or Rodenstock or Linhof or whoever. Nor do I comment on filters sold under a camera maker's name - Canon, Nikon, Leica, etc. Someone with actual experience with them should comment. My only comment here is that Canon filters sold in the USA are apparently made by Tiffen.

Conclusion.

If you're on a modest budget, buy UV multicoated filters from Hoya, slap 'em on your lenses and keep them scrupulously clean. And get a multicoated Hoya polarizer as well. If you don't want to buy more than one just buy the largest size you'll need and a couple of metal step rings that adapt the larger size to the smaller lens. Have fun!

- NK Guy, [tela design](#).

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