



COKIN 121 L Graduated Gray filter
Photo : J.F Fortchantre

cokin[®]

Neutral Density Filters

■ Why Filters ?

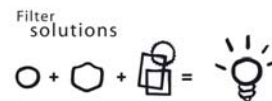
Filters are to photographers what adjectives are to writers. They help inject precision and personal touch to your images.

Like any tool, COKIN Filters will not solve ALL your photographic or video problems. However, with some imagination and experimentation, they will greatly help expand the possibilities of what you can successfully translate from your mind's eye to CCD, film or tape.

Many of the COKIN effects can not be produced on computer whatever the performance of the software. This is particularly true with all effects related to light management (light polarization, light balance, brightness control, etc) where the quality of the image is fully related to light expertise at time shooting. Filters not only offer an indispensable support but also a considerable amount of time saving in post production software job. Combining the use of COKIN filters with post-production work is an option a lot of PRO Photographers go for today.



Photo : Andrew Kime



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■ Why Neutral Density (ND) ?

ND filters are among those tools which became indispensable in today's digital technology. They offer the possibility to achieve otherwise unachievable results as they are the real *sunglasses* for your camera. Typically, ND filters are used when shooting in bright light such as strong sunshine, snowy mountains or on white beaches.

NDs filter the entire visible spectrum **evenly**, allowing light reduction - *reduce the amount of light reaching the CCD, film or tape* -, without altering the relative spectral distribution of the energy thus without influence on colour temperature, colour balance or contrast. For this reason, they are often referred to as **neutral or grey filters**.



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Main applications:

ND filters allow:

1. A larger aperture and consequently a smaller depth of field which helps, for instance, separate (isolate) subjects from their background (which becomes blurred). The lens operates then in the range of its best optical performance, say around $f/5.6$ to $f/8$, rather than a very small opening where diffraction or other optical artifacts might become an issue.
2. A much slower shutter speed to be used at reasonable aperture, to record movement (create sense of motion) in subjects such as waterfalls, clouds, cars, seas...
3. A decrease of the effective ISO of high speed film (above ISO 400) to make it possible to be used outdoor in bright situations.
4. A proper use of cine and video cameras (which have fixed shutter speeds) to film subjects such as snow, sand or other bright scenes causing so oftenly overexposure issues.
5. A closer focus and larger depth of field in flash macro photography without overpowering the image.

Several density types:

ND filters come in many strengths or different levels of tint (densities) for fine-tuning exposures as well as various rates of transition:

ND2 reduces amount of light to 50%
ND4 reduces amount of light to 25%
ND8 reduces amount of light to 12.5%

or in other words

- ⇒ ND-2 absorbs 1 f-stop of light
- ⇒ ND-4 absorbs 2 f-stops of light
- ⇒ ND-8 absorbs 3 f-stops of light

Depending on the manufacturer, there are different namings to these strengths or levels (*one is the decimal logarithm of the other*)

or in other words

- ⇒ ND2 = ND 0.3
- ⇒ ND4 = ND 0.6
- ⇒ ND8 = ND 0.9

COKIN ND2



Photo : L. Sierre

COKIN ND4



Photo : L. Sierre

COKIN ND8



Photo : L. Sierre

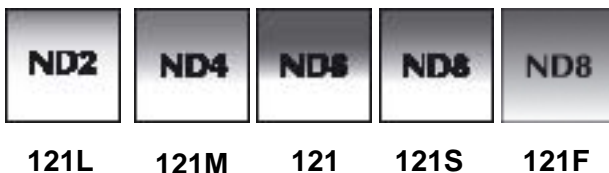
■ Why Graduated Neutral Density ?

Unlike human eyes, CCD or film have no emotions or imagination. They only see light as levels of brightness. A large difference in brightness between sky and foreground is beyond their ability to see and record. This is where graduated neutral-density (ND) filters come in. By using one of these filters, you will be able to bring to CCD or film what you see with your eyes. Grad ND filters can't create light but they can help you capture it properly.

Pro landscape photographers often use Grad NDs to darken a bright sky so that both the sky and subject can be properly exposed thus capturing greater details.

Use these filters when you need to control the contrast range in your landscape images to avoid blowing out highlights, like snow-covered mountains or dramatic skies.

How do you know when you need one? With some experience, you get a pretty good idea of when the light range in a scene is beyond the ability of the CCD or film to record, but one sure way is to use your in-camera spot meter and evaluate the scene. Check the difference between the exposure needed for your foreground and the exposure needed for the background. If there's no difference between the two, then you don't need a filter. But if there is, say, a 2-stop difference, then you need a 2-stop filter (ND4 = ND0.6).



Several types

COKIN Graduated ND Filters are available in "soft-step" and "hard-step" types. The soft-step filters are suited for scenes with no distinct boundary between light and dark zones. The hard-step (abrupt boundary) are used for scenes where sky and foreground areas are distinctly separated, usually at the horizon. Soft-step filters are however the universal choice. Both the soft-step and hard-step types are offered in the 3 major (1, 2, 3 steps) density graduations.

To be noted, **wide-angle lenses**, because of their inherent greater depth of field (particularly with smaller apertures), will deliver a more pronounced and noticeable graduation than higher focal lengths (50mm and up).

■ Why COKIN Square filters ?

The ability to precisely place the transition (boundary) is why Pro photographers use square filters (rectangular, in fact). They won't accept to be totally locked with screw-in grad NDs when it comes to the composition of the shot. Horizon always in the middle of the frame, this is exactly what they want to avoid.

In addition, they value all other advantages of the COKIN Square Filter System :

- Quick use (in and out easily and fast ; just slide in/out the filters).
- One filter for all the lenses (big saving !).
- Numerous possibilities to combine several filters.

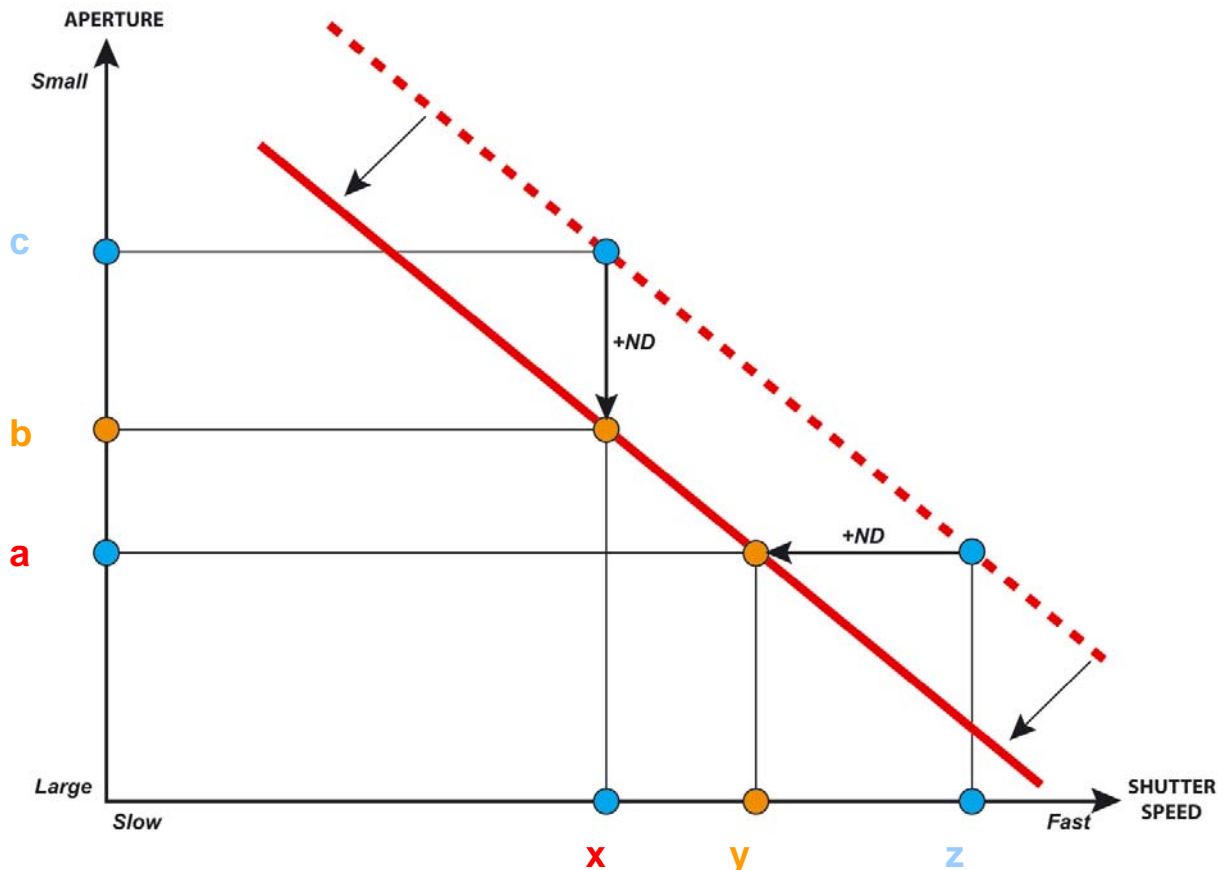


**Let experimentation, creativity and personal taste
guide your use of these indispensable tools !!**

More technical Info

The difficult aspect to understand in photography is that shutter speed and aperture are fully related (dependant) one from the other. More precisely, if you change the shutter speed, you automatically and necessarily modify the aperture. This is where ND filters come in.

APERTURE / SHUTTER SPEED DIAGRAM - ND FILTERS



The continuous line indicates a constant exposure value. As you can see, many different aperture-shutter speed combinations are possible. ND filter allows to reduce shutter speed (exposure value) as per the red continuous line.

Example:

For aperture **a** → ND will allow you to **reduce speed** (from **z** to **y**)

For speed **x** → ND will allow you to **widen the aperture** (from **c** to **b**)

	Without ND	With ND
For aperture a	Speed z	Speed y
For speed x	Aperture c	Aperture b