Long Exposure Photography with Lens Filters: The Definitive Guide

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Filters?

Don't get confused!

This guide is not about filters that you can apply on Instagram... quite the contrary.

This guide is about how you can use different types of lens filters (yes, those that you place in front of the lens) to create a bunch of jaw-dropping images straight on camera.

Tons of fun, great creative potential, less time in post-processing... Lens filters have lots of advantages!

Filters are awesome!

So keep reading...

In this guide you'll find everything you need to become an expert in shooting with all types of lens filters.

Everything!

From the types of filters (polarizer, ND, GND, UV etc.) and their applications, including a lot of practical examples to inspire you, to how to find the perfect location, how to plan your photo ideas with **PhotoPills** and how to use step-by-step camera filters to create amazing effects.

Are you ready?

The adventure begins.

Welcome to the wonderful world of lens filters!

"Obviously, we all look at things through the filter of our own experience." - ***Malcolm-Jamal Warner***

Content

Section 1:

10 images shot with filters that will inspire you

A great photo always starts with a great idea.

Something you have imagined, something that you think it would be possible and that you want to capture with your camera.

It's a very simple creative process but it's very, very powerful.

As PhotoPillers (crazy photographers and **PhotoPills** users) we usually sum it up in three words:

"Imagine. Plan. Shoot!"

It's our motto, our battle cry.

But don't worry, we still haven't forced any PhotoPiller to tattoo it onto his arm, wearing **our t-shirt** is enough :D

Jokes aside, when shooting with filters, as with any other type of photography, location is key. We'll see why and how to find the perfect location later on (**section 3**).

Yes, locations are an inspiration.

But if in addition to a dream location, you add some of these resources to your creative process, success is guaranteed :P

Imagine... Let your imagination fly!

Black and white (1)

Nikon D4s | 14mm | f/5.6 | 10s | ISO 200 | 5600K | ND 1.8 (6 stops) and soft GND 0.9 (3 stops) filters

Most photographers associate landscape photography with color. And that's particularly true when shooting long exposures with filters.

However, black and white photography can help you create a completely different and much more powerful atmosphere.

As you can see in the image, both the water that hits the rocks and the clouds come out blurred thanks to the effect of a neutral density filter (ND).

Thanks to the long exposure, you can see that the movement of the clouds looks even more threatening. This, along with the luminosity and texture of the rock, allows me to create a dramatic and dynamic scene at the same time.

Obviously, the fact that I chose a relatively low point of view also contributes to this. This helped me to emphasize the lighthouse and, above all, the sky.

Lines (2)

Nikon D4s | 22mm | f/5.6 | 20s | ISO 100 | 7500K | ND 1.8 (6 stops), soft GND 0.9 (3 stops) and polarizer filters

If you want to produce an impact on your spectator, there is nothing more effective than to guide her eye. And in order to achieve that lines are your best ally.

Look at the picture in this example. What was the first thing that caught your attention? And where did you look afterwards?

While I was working on the image composition, my idea was to give as much importance as possible to the foreground. That's why I looked among the rocks for an area with a lot of moss. As you can see, the contrast between the greens and the black is a very powerful magnet.

At the same time, the moss snakes from the bottom up in the frame following an "S" shape to reach the sea, the horizon.

And once there, I thought it would be very interesting to include a person in the frame. More specifically, a photographer who was there with his camera enjoying the moment. That person is the second magnet that has lured your eye.

In addition, this person helps me to give scale to the scene and to make the image more three-dimensional since he's located in the background, in a middle plane between the moss and the sea on the horizon.

Water (3)

Nikon D4s | 116mm | f/11 | 1/5s | ISO 100 | 6500K | ND 1.8 (6 stops), soft reverse GND 0.9 (3 stops) and polarizer (to highlight the rainbow) filters

In this scene the greatest challenge wasn't actually the composition, but being able to capture the rainbow formed thanks to the water spray.

Because of the terrain and the location of the waterfall on the Kunene River, the natural

border between Namibia and Angola, it was very difficult to work on any composition other than what you see in the photo. I barely had room to position the tripod, but I tried to place it as close as possible to the cliff's edge so that the waterfall would be in the central part of the frame.

But as I told you at the beginning, the key to the image is the rainbow. To clearly highlight it on the image, I decided to use a polarizer and rotate it until the rainbow stood out as much as possible. Conversely, if I had turned the filter in the other direction, it would have vanished.

Thanks to the ND filter I was able to use a slower shutter speed and thus get a silky water to convey strength and dynamism. Those were the same things that I was perceiving while listening to the water fall onto the canyon.

Reflection (4)

Nikon D4s | 17mm | f/8 | 1/125s | ISO 100 | 6500K | Soft GND 0.9 (3 stops) and polarizer filters

Whenever I see this picture it brings back great memories of **my trip to Iceland**. Those were very emotional days...

But back to filters, this photo is a perfect example of how useful a polarizer can be when it comes to highlighting reflections. Especially if you find yourself facing a scene in which the water is perfectly flat.

Once you have the polarizer mounted, turn it one way or the other while you're composing the photo. You'll see how the water goes magically from being completely transparent to being a perfect mirror.

While you're checking the effect of the polarizer, change your point of view. As you can see in this photo, the idea was to frame the scene in such a way that the mountains would create a reflection on the water as big as possible. And that's exactly what I did.

Fog (5)

Nikon D700 | 200mm | f/4 | 1/350s | ISO 200 | 4450K | Soft GND 0.9 (3 stops) filter

There's nothing more ethereal and mystical than fog. It's an element that completely transforms a scene.

And no, a filter doesn't allow you to create fog from scratch... There are other tricks for that... ;)

But it does allow you to enhance it and make the light even more diffuse.

In this photo, the fog that covered the entire background and part of the surface of the water was awesome. It helped me to remove detail from many elements that were completely superfluous and, at the same time, to highlight the cabin and the fisherman. Therefore, the human element becomes the main subject.

However, the fog was very low and the Sun started to cast a harsh light to the whole scene. That light destroyed the magic of the moment and also the **dynamic range** that my camera was capable of capturing.

So the easiest solution was to use a GND filter to mitigate the highlights and balance them with the shadows of the scene.

Architecture (6)

Nikon D4s | 18mm | f/16 | 181s | ISO 100 | 6250K | ND 3.0 (10 stops) filter

Have you ever heard about the daytime long exposure (DLE) technique?

You take a photo in the central hours of the day, when the light is quite harsh, and you slow down the maximum shutter speed (from a couple of minutes to... let's say... infinity?) using one or more ND filters.

Therefore, the sky and water (if any) have a very exaggerated silky effect and no texture whatsoever.

In addition to this, most of these pictures are turned into black and white, to exaggerate the contrast and accentuate the blacks and whites so that the architectural elements have a lot of detail. This, in turn, counteracts the lack of clarity of the clouds (and water).

As you can see in the photo, the idea is to convey a slightly distorted and somewhat dreamy scene or a set of elements that would look quite vulgar in any other type of image.

Clouds (7)

Nikon D4s | 14mm | f/16 | 120s | ISO 100 | 7500K | ND 1.8 (6 stops) and soft GND 1.2 (4 stops) filters

Seeing the clouds "running" across the sky is always a great show.

Although it seems impossible, it's something that you can observe with the naked eye, and

also capture it with your camera.

Take a look at this picture.

The fact that rough, cracked and completely dry soil occupies the foreground and almost a third of the framing is not a coincidence. But it turns out to be a static element.

To counteract this effect and give more dynamism to the image, I chose to make a long exposure thanks to the ND filter. That way the clouds would cross the sky at full speed over the sea.

At the same time, I used a GND filter to control the highlights and to avoid a blown out Sun at the background.

Isolation (8)

Nikon D4s | 27mm | f/5.6 | 45s | ISO 200 | 6500K | ND 1.8 (6 stops), soft reverse GND 0.6 (2 stops) and polarizer filters

If you want to take a powerful photo, there's nothing like creating a simple composition in which the main subject is completely isolated.

Look at the picture in this example.

It's a scene with very few elements: a bunch of rocks bathed by the sea, the horizon and an almost flat sky.

And despite everything, or actually because of it, it's a powerful photo, don't you think?

In this case, I worked on a simple composition to avoid the temptation of including too many elements in the frame. But filters played an essential role as well.

On the one hand, the ND filter allowed me to get a beautiful and silky water to give dynamism to the image. And, at the same time, it removes detail in the water that didn't seem interesting to me (drops, foam, small waves).

On the other hand, the reverse GND allowed me to control the highlights on the horizon so that the sky would be correctly exposed.

And finally, the polarizer allowed me to get a crystal clear water to show a lot of detail in the rocks located in the background.

That way, I was able to isolate the rocks on the surface and turn them into my main subject.

Trail (9)

Nikon D700 | 21mm | f/16 | 1.5s | ISO 200 | 5600K | ND 0.6 (2 stops) filter

This photo is an example of how you can use a ND filter in broad daylight and manage to convey movement.

If you look at the scene, it's a forest full of tall grass. Despite the lack of sharpness you can easily recognize the tall grass in the lower third of the frame. At the same time, the grass is blurred so you still sense that a relatively strong breeze was blowing at that moment.

This effect is very easy to capture. All you have to do is use an ND filter (even a small density one like the one I used for this picture) to shoot at a slow shutter speed and get that blur.

Infrared (10)

Nikon D300 IR | 14mm | f/16 | 1/4s | ISO 200 | 2150K | Infrared filter installed over the sensor

Have you been to Iceland?

If you answered "yes", then this location should sound familiar to you.

But if you haven't traveled there, you may have seen this location in the portfolio of one of your favorite landscape photographers. It's an extremely popular place where thousands of photographers go every year.

And I wasn't going to miss the chance... :)

I have to confess that I did take **the usual postcard** shot that, as I was mentioning before, I'm sure you've already seen online.

But I also wanted to capture a special memory of the Kirkjufell and its waterfalls.

I've had a Nikon with an infrared filter installed on the sensor for many years. And it's a camera that I like to use on special occasions like this one.

If you compare this photo with the regular postcard shot that I took, you'll notice that when

I was in Iceland, the Kirkjufell wasn't snowed. Neither the rocks and the edges of the waterfalls. Actually, everything had a beautiful green color.

A high contrast black and white image is very similar to any picture you get with an infrared camera. But as I wrote, they're only "similar"...

Well, that's why an infrared filter is magical: it makes you see things that are different from reality ;)

Solar eclipse (11) *[bonus track]*

Nikon D500 | 480mm | f/8 | 1/500s | ISO 100 | 7460K | Baader solar filter

Have you ever had the chance to see a partial solar eclipse? And a total one?

No? Well, you should. It's a once in a lifetime experience.

And if you've been as lucky as me, and you've managed to photograph a total eclipse, it's something you'll never forget. Those images will be stuck in your memory (and on your hard drive :)) forever.

Living and photographing the total solar eclipse of August 21, 2017 in Portland (USA) was quite an experience... and a challenge.

I took this photo during the partial eclipse phase, a few minutes before totality, that is the (brief) moment during which the Moon covers the Sun completely.

Obviously, when you're photographing the partial eclipse phase, don't forget to protect your camera with a solar filter (**section 2**) and your eyes with a pair of approved eclipse glasses. You'll prevent the sensor and your retinas from ending up severely damaged.

If you want to learn how to photograph a partial phase of the eclipse, study the example (21) *[bonus track]* of **section 17**.

And if you also want to learn how to photograph all the phases of a total solar eclipse, including the diamond ring, Baily's beads, the corona, the chromosphere and even details of the Moon's surface, take a look at **'Solar Eclipses: The Definitive Photography Guide'**.

The only problem is that a total solar eclipse is not very frequent. So maybe you should start to practice with a lunar eclipse first: **'Lunar Eclipses: The Definitive Photography Guide'**.

So... what's next?

Do you feel inspired?

"Sure Toni, now I have a tons of ideas!"

I hope so, because we're about to enter into the exciting world of photography filters.

Let's see the types of lens filters and their practical applications.

It gets bumpy from here on out! :P

Section 2:

Types of lens filters (and their applications)

Explaining in depth the different types of filters and their practical applications is going to take me a while (and a lot of pages)...

The following table is a summary of the options you have.

Filter	What is it for?
Ultaviolet (UV)	Blocks ultraviolet rays.
Skylight	In film cameras, it offsets the bluish cast that some scenes can have.
Polarizer	Eliminates non-metallic reflections. Eliminates or enhances fog and rainbows. Increases saturation and contrast.
Gold-N-Blue Polarizer	Adds variable gold or blue tones to reflections depending on the orientation of the filter.
Varicolor Blue/Yellow Polarizer	Adds variable gold or blue tones to reflections depending on the orientation of the filter.
Neutral density (ND)	Reduces evenly the light that reaches the sensor. Increases the exposure time.
Graduated neutral density (GND)	Gradually reduces the light that reaches the sensor with greater intensity on one of the edges of the filter. Successfully captures scenes with a high dynamic range.
Reverse graduated neutral density	Gradually reduces the light that reaches the sensor with greater intensity from the center of the filter. Successfully captures a high dynamic range scenes.
Black card	Prevents light from reaching the sensor.
Infrared	Allows only infrared light to reach the sensor.
Light pollution reduction	Prevents sodium vapor bulbs from changing the color temperature of the night scene.

continues on next page

Table 1 – continued from previous page

Filter	What is it for?
Solar	Allows to photograph directly the Sun or a solar eclipse preventing the sensor from capturing infrared (IR) and ultraviolet (UV) rays.

As you can see, the creative options you have with filters are endless!

But let's start from the beginning...

What is a filter?

The filter is an accessory that you place in front of the lens of your camera and allows you to achieve a series of effects (see table above) that otherwise would not be possible (or almost impossible).

The filter actually modifies the light and/or color that reaches the camera sensor so you get a correct exposure or achieve a specific effect. Later on, I'll go into depth on these effects as I explain in detail each of the different filter types.

As for the materials, a filter can be made of crystal, resin or polyester. Glass is a higher quality material, gives better results and produces fewer side effects, so it's more expensive. Polyester, on the other hand, is of lower quality and it may produce a less perfect effect.

"Toni, what filters do you use?"

I use **Lucroit** glass filters. I like them because, although they are more expensive than those of other brands, they allow me to produce higher quality images. So it's worth spending a bit more money on them.

Let's keep going.

A filter can be circular screw-on, drop-in, square or rectangular.

And depending on its shape, the mounting method onto the lens varies. The mounting method is known as a "system".

Systems (or mounting methods)

There are several filter systems:

- The circular screw-on.
- The drop-in for some telephoto lenses.
- The square gel filter for some wide angle lenses.
- The square or rectangular (my favorites).

Circular screw-on filters

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A circular filter is a piece of glass, resin or polyester in the shape of a circle that has a metallic edge so you can screw it onto the lens thread.

Obviously, the size of the filter you should buy depends on your lens' specific diameter.

So, at first sight, you may not be able to use a circular filter of a certain diameter on a lens that doesn't have that specific diameter.

And I've written "*at first sight*" on purpose because you can always get a tool that allows you to use the same circular filter on different lenses – an adapter ring.

Imagine you have a 77mm diameter lens and a 58mm diameter one. My recommendation would be to buy a 77mm filter and an adapter ring to screw it onto your 58mm lens.

Keep in mind that it doesn't work the other way around. In other words, if you had a 58mm filter, it wouldn't cover the entire surface of your 77mm lens, so you would end up seeing the filter edges in the photo.

Therefore, your circular filter should have the same diameter as your bigger lens.

Some photographers prefer to use circular filters for the following reasons:

- You can leave them screwed onto your lens so mounting them is very simple and fast.
- It's very easy to stack them as you only have to screw one on top of the other.
- They have a reduced size so they are easily stored and transported.
- They are more resistant than other types of filters.

But they also have several drawbacks:

- Because they have to fit into the thread of your lens, they must have a specific diameter. So it's complicated to interchange between one lens and another.
- Circular filters can be difficult to unscrew. Sometimes they get stuck and are hard to handle in cold and low temperature situations.
- When you want to apply several filters, placing them on top of each other produces vignetting (darkening of image corners when compared to the center).

If you're interested in buying circular filters, these are the most popular brands: Hoya, B+W, Haida, Tiffen, Breakthrough, Singh-Ray, NiSi, Formatt-Hitech and Haida.

In my opinion, these reasons are enough to recommend you to use square and rectangular filters. They are the filters I use and I love them.

However, that doesn't mean that you can't stack circular filters with square and/or rectangular filters. For example, the B+W ND 3.0 (10 stops) circular filter is spectacular. So you could include it in your kit and, at the same time, use a rectangular GND filter along with a filter holder.

It's not the most comfortable combination in the world, but it can be a very good option depending on the type of filters you have and the quality you're looking for.

I'll tell you more about them later on. Before that, let me tell you about a very peculiar type of filter.

Drop-in filters for telephoto lenses

A drop-in filter is only used for telephoto lenses with a long (from 200mm) or very long (up to 800mm) focal range.

The problem with any long-range and some angular telephoto lenses is that the front lens is so large that no conventional filter, whether circular, square or rectangular, can help you get the effects you're looking for.

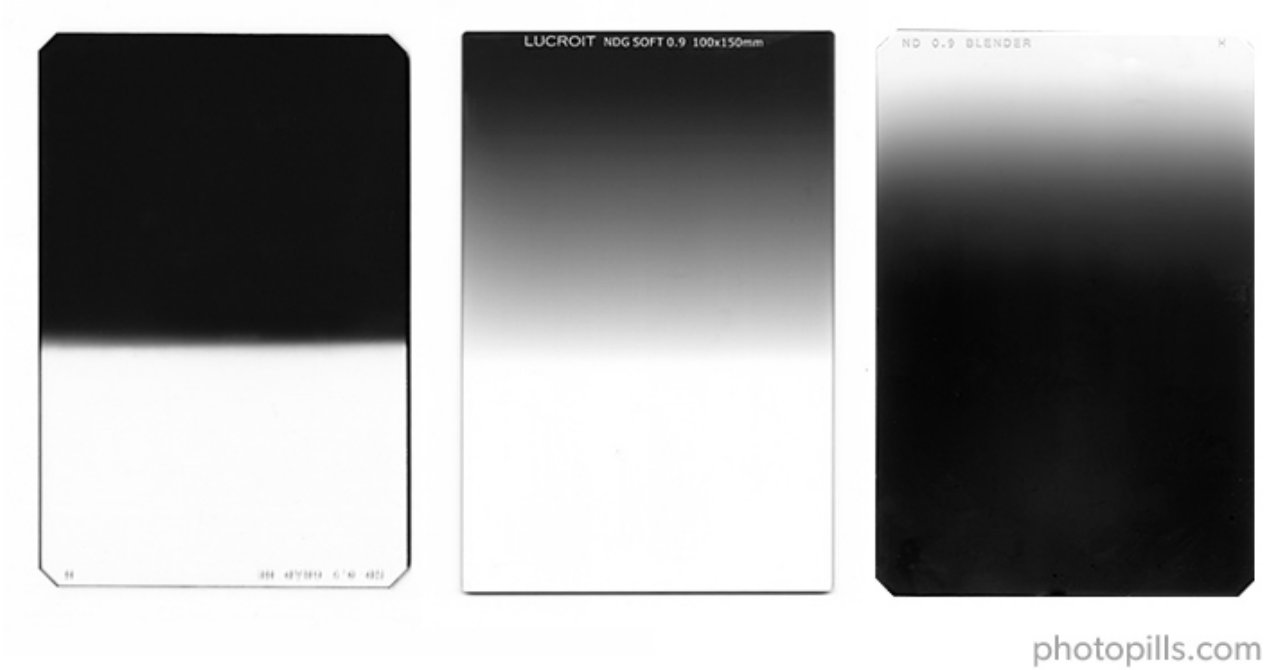
Instead, these lenses have a slot in the back where you can insert a drop-in glass filter. This slot has nothing to do with another slot that certain wide angles have and where you can insert a very thin pre-cut gelatin sheet. These gelatin sheets also act as a filter, although for other purposes.

As you can see in the photos below, to insert the filter in this slot you need an adapter where you can place a neutral density filter (ND) or a polarizing filter.

You'll be using circular filters in both cases, so they must have a specific diameter to fit perfectly into the adapter and then into the telephoto lens.

Finally, let's see have a look at both square and rectangular filters.

Square and rectangular filters



Certain filters can be square (usually **neutral density or ND**) or rectangular (**graduated neutral density or GND** ones).

Square filters can come in many different sizes (70, 75, 100, 150, 165 and 180mm), although the most common one is 100mm. Rectangular ones can be 67x85, 75x90, 70x100, 100x150, 150x170, 165x200 and 180x210mm, although the most used size is 100x150mm.

"Toni, how do I know what size does my filter should have?"

It's very simple.

It depends on the minimum focal length of your lens.

Imagine you have this very popular lens among beginners: the 18-55mm f/3.5-5.6 from Nikon (or any other brand).

If you use it with an APS-C camera, take into account the cropping factor (1.5x for Nikon). Thus, the field of view at 18mm will be a bit wide (18 x 1.5 = 27mm). In this case, a 100mm filter will be more than enough.

Let's suppose now that you have a Nikon 14-24mm f/2.8. It's a very fast and high-end wide angle lens.

If you combine it with a full frame camera and you take a picture at 14mm, the field of view

of this lens is so wide that any filter smaller than 165mm will create a beautiful vignetting in the corners... XD

If you have a compact or Micro 4/3 camera, that is a camera with a relatively small sensor, be careful with the size of filters you use.

Why? Because if you use filters that are too big for this system, the transition area may cover a good portion or all of the image. The filter will be behaving more like a blender rather than a GND.

Moreover, sometimes you can use a hard GND filter as a soft GND if you have a Micro 4/3 camera.

In fact, if you have doubts about any of your lenses, the best thing to do is ask at your local photo store. Or read reviews online. It's very easy to find information.

One more thing...

The focal length, the aperture you set and the sensor size also affect the filter transition.

Due to the "zoom" effect, the transition in a super telephoto lens (focal lengths above 200mm) looks much softer compared to a wide angle lens (focal lengths below 24mm).

In addition to this, the greater the aperture the more blurred you'll see the gradient, as a result of the shallower depth of field.

Square and rectangular filters are usually made of glass or resin. And you need a filter holder to use them, that is a piece of plastic or metal that you attach to your lens.

The advantages of using these filters are:

- As they are not circular, nor do they depend on a specific lens size, they are perfectly interchangeable. Therefore, you can use the same filters with different lenses.
- The filter holder has several slots where you can slide several filters at the same time. You won't get any vignetting.
- It's easy to slide the GND filters very precisely to position the transition exactly where you need.

However, square and rectangular filters also have their drawbacks:

- They are bigger than a circular filter and much more fragile. If you drop it on the ground, it will most likely break.

- You need a filter holder to be able to use them, so you'll need to carry more equipment. The filter holder is not essential, you could hold the filter with your hand depending on the shutter speed, but I highly recommend you to use one because it will make your life easier.

If you're interested in buying square and rectangular filters, these are the most popular brands: Lucroit, NiSi, Lee, Benro, Formatt-Hitech, Cokin, Singh-Ray, Breakthrough and Haida.

Now that you know the different mounting systems to attach the filter to the lens of your camera, let's focus on the different types of filters and their applications.

Depending on the effect you want to get in your final image, you'll use one filter or another.

So let's see the different types of filters, their uses, and their advantages and disadvantages.

Ultraviolet (UV) and Skylight

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A few years ago, when most of us used film cameras, both filters used to be useful. Today, most photographers who use them do so to protect their lenses from breaking or scratches.

What is an ultraviolet (UV) filter?

An ultraviolet (UV) filter is a glass filter, usually circular, that you screw onto the front of the lens and blocks ultraviolet rays.

What exactly does a UV filter do?

A UV filter is generally used, as I said before, to block ultraviolet rays. It's the equivalent to a sunscreen protection for your camera.

Back in the days of film photography some films were very sensitive to ultraviolet light. So if you didn't use a UV filter, you could end up with a blue cast affecting the exposure and color temperature of the pictures after developing them. Obviously, this problem was even worse if you took pictures on a very sunny day or at a relatively high location above sea level.

The fact is that modern films and digital sensors of any DSLR or mirrorless camera have a UV filter over them that protects them from this type of light. So the UV filter has become basically useless.

However, many photographers still use it as a protection for their lenses.

What is a Skylight filter?

A Skylight filter is a glass filter, almost always circular, that you screw onto the front of the lens. In addition to blocking ultraviolet rays, the filter has a faint orange-pink cast.

What exactly does a Skylight filter do?

Like a UV filter, this filter is used with film cameras.

The effect of a Skylight filter is slightly warm. Thus, if you're using a film with a specific color temperature for outdoor day scenes, the filter counteracts the bluish cast that some scenes, especially indoor ones, may have.

Obviously, if you use this filter with a digital camera (although, in my opinion, it doesn't make much sense) and you have some color problem in your photos, you can always correct it in post-processing with a software like **Lightroom** or **Photoshop**.

The difference between a UV filter and a Skylight filter is that the first one is neutral (has

no tint or color cast) while the second one is a basic color correction filter with a slightly magenta tint.

Does a UV or Skylight filter really protect your lens?

If you drop your brand new $2,500 lens, the UV filter (which cost you $20) will break instead of the front glass of your lens. And, obviously, it would always be easier to buy a new filter than to send the lens to the official repair service to fix it, wouldn't it?

Yet, although it seems like a good idea, the truth is that in practice it's not quite like that.

The reality is that the glass of any UV filter is much more fragile than the front glass of any lens. So the UV filter is often broken by falls that usually don't affect the lens.

As if this were not enough, if you hit or drop a lens strongly enough to damage the front glass, your lens will suffer some internal damage as well. So, even if the UV filter had protected the front glass, the lens would still be damaged.

In short, if you drop your lens with a UV filter and only the filter breaks but not the lens, all you did was breaking a filter. The lens would have survived in any case. And if you drop your lens without a UV filter and it breaks, an UV filter wouldn't have prevented it.

> *"But Toni, does that mean that UV and Skylight filters offer no protection at all?"*

No. The bottom line is that they offer no protection against impacts. But they do protect your lens from dust, scratches, sand and other small threats.

The negative effects of a UV filter (or a Skylight filter)

One last thing.

Don't forget that putting any glass in front of your lens will negatively affect the quality of the image.

A UV filter blocks a small percentage (between 0.1% and 5%) of the light that goes through it. The effect the filter has on the light slightly reduces the sharpness and contrast of your images. It's a barely noticeable effect that can be easily fixed with **Lightroom** or **Photoshop**, but you should be aware of it.

Unfortunately, that's not it...

A UV filter can also cause flare or halos if you're photographing a scene with a bright light source, especially in low ambient light or night photography. In these cases the flare is much more visible.

In addition to this, exposing your lens to UV rays helps to eliminate any fungus that may have grown. If you always have a UV filter screwed onto your lens, the chances of having fungus in your lens are much higher: moisture can slip between the lens front glass and the UV filter and fungus can create a great home XD

Should you use a UV filter (or a Skylight filter)?

Actually, it depends. Although I admit that I am not very fond of UV filters, I never use them.

Before you buy a UV filter and put it in front of your lens, keep in mind that:

- A UV filter will protect your lens from dust and scratches at best. It might be a good idea to use one on the beach or in the desert. But in most cases, it's best not to use it.
- UV filters have a small negative impact on your image quality. Most of the time, you won't notice the difference. But if you're looking for the best possible image quality, or if your photos show flares and halos, don't use a UV filter.

Polarizer

When using the polarizer (right picture) the reflections in the water disappear.

A polarizing filter is a piece of glass whose key function is to reduce the amount of reflected light that enters through the lens of your camera and the sensor ends up recording.

Thanks to this filter you can increase the saturation and contrast of your photo.

You can also remove non-metallic reflections (it's very useful for example to make the water more transparent and show more detail on the background), glitter on the surface of an object and even reduce the mist. As the filter gets darker, the reflections on the water disappear and the color of the scene elements (e.g. vegetation) becomes more intense.

The filtered angle is controlled by rotating the polarizer. Therefore, as you rotate the filter, these effects appear or disappear.

Moreover, you can control the intensity of this effect by changing the camera's line of focus with respect to the Sun.

But let's start from the beginning. Let's have a look at the different types of polarizing filters that exist.

Types of polarizing filters (and how they work)

"Wait Toni, wait... Are you saying that there several types of polarizers?"

Actually, I do.

Polarizing filters can be linear or circular.

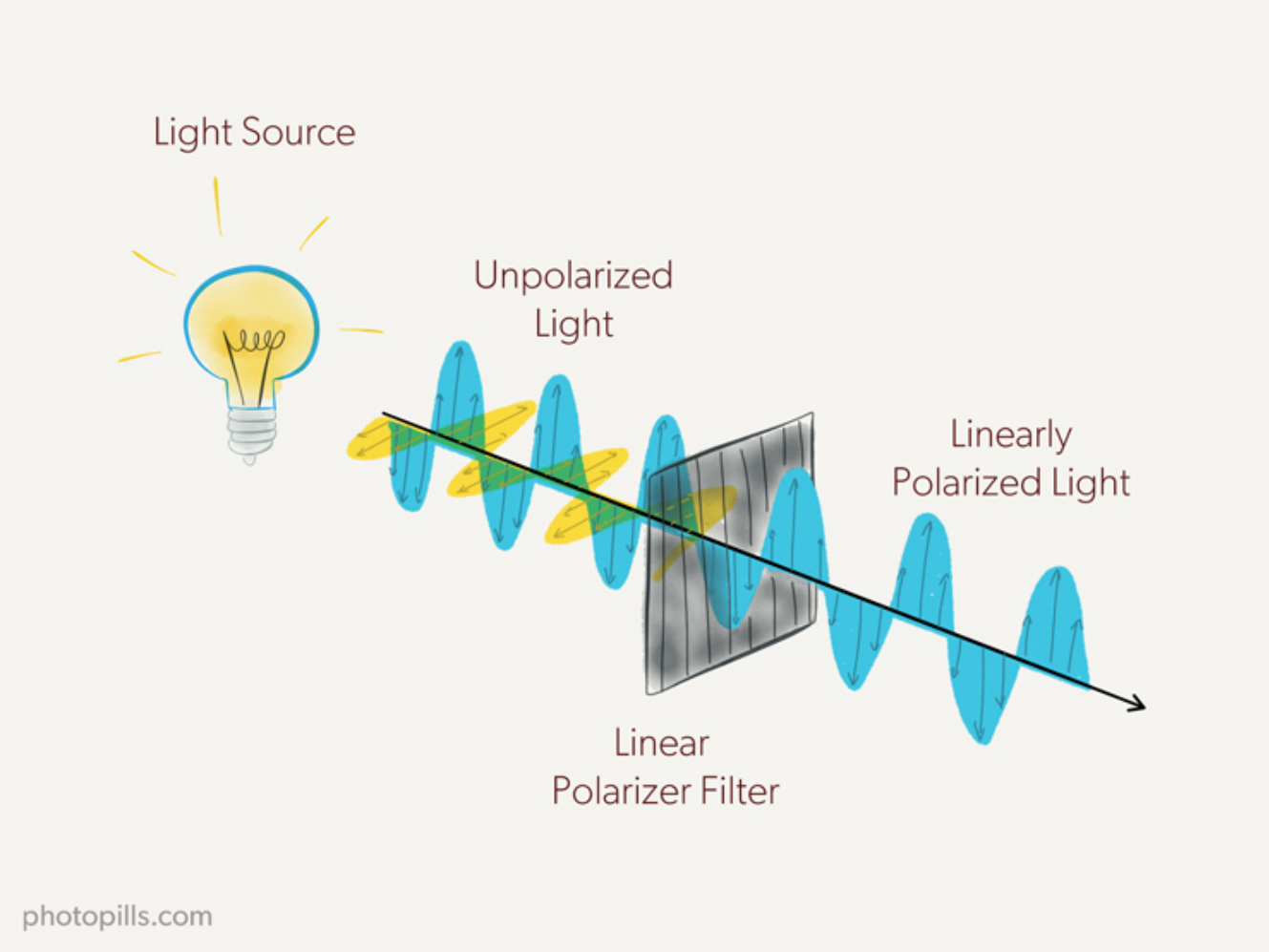
But beware! Don't fall into the trap: the name of these filters has nothing to do with their shape (square or round), or the fact that they rotate (every single one does), but with the way they work.

As I said at the beginning of this section, this type of filter depends on the behavior of the light.

When a beam of light moves in a straight line, it does so as it oscillates in an infinite number of planes around the axis that marks the movement direction. Each of these planes is a polarization plane. So with the polarizer you can reduce all those planes to one or a very

small range of them.

Maybe this diagram will help you understand it better.



This is how a linear polarizing filter works.

But there's a problem...

Well, your DSLR or mirrorless camera may not work properly.

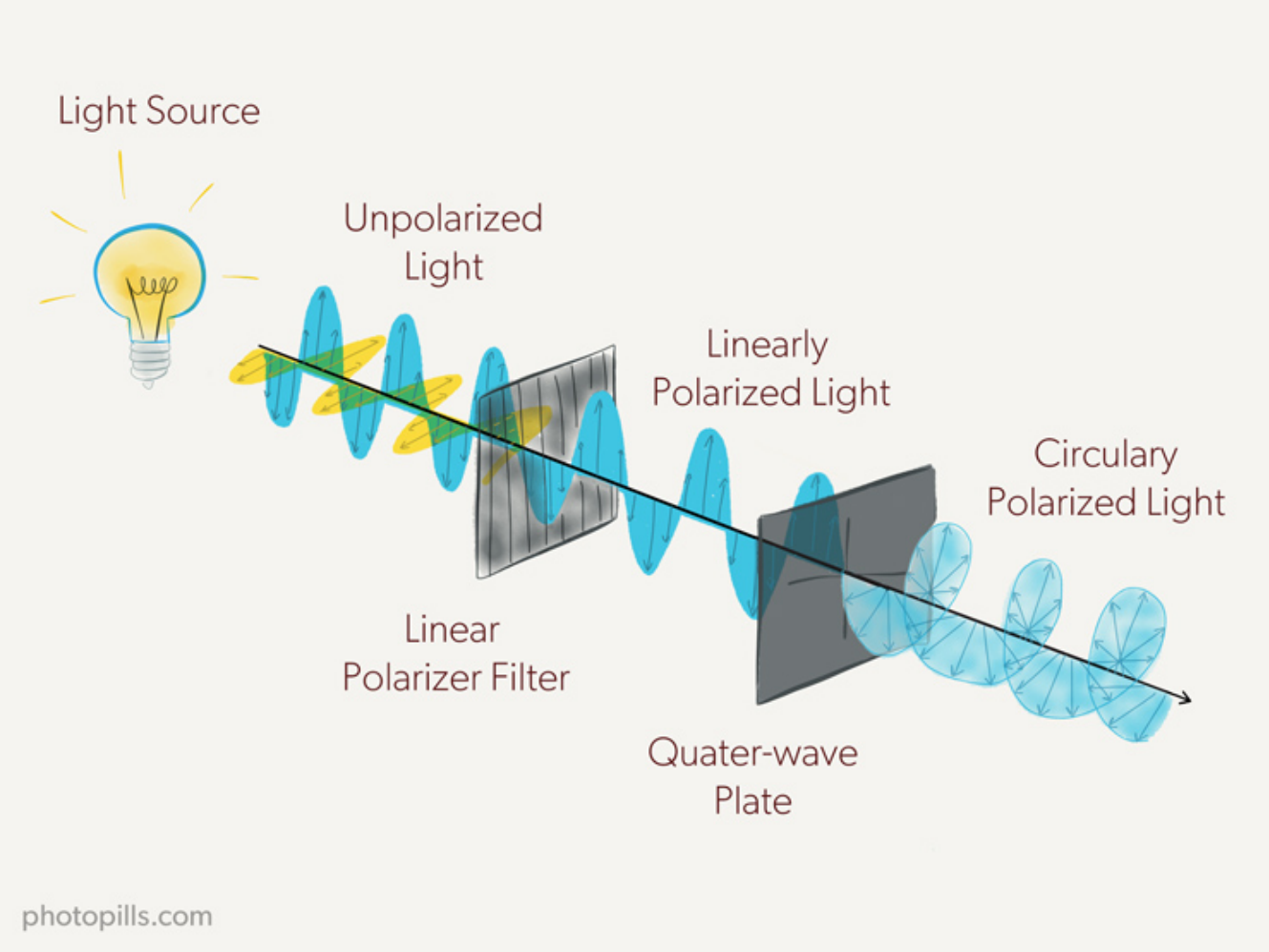
Don't panic, it won't break down. The thing is that, as the light is polarized linearly in a single plane, the light meter or the autofocus system can be confused when metering. And your photo will be badly exposed, out of focus or both.

How can you avoid it?

Eureka!

Using a circular polarizing filter (CPL). This type of filter has a second element, called a quarter wave plate that converts the already linearly polarized light into a circular polar-

ization, thus avoiding any problems with the light meter or the autofocus system.



Why should you use a polarizing filter?

One of the biggest frustrations we landscape photographers have is that our photos sometimes lack color saturation.

Why?

Well, this is mainly due to the way the light bounces off the ground and all the other elements in the scene. The light bounces following a series of specific angles (each angle depends on the element in which it bounces), so the image looks dull and flat.

However, if you place a circular polarizing filter (or CPL) in front of your lens and rotate it to a certain angle, the filter is able to eliminate most of the light reflected in your scene. In other words, it increases your photo saturation and contrast.

Similarly, when shooting distant subjects (e.g. a mountain range), the polarizer reduces the haze.

Finally, the circular polarizer filter is perfect for removing reflections, as long as they're non-metallic. This way you can capture crystal clear water or remove the glare on certain surfaces (building glasses, for example).

Yes, I know what you're going to say. That **Lightroom** or **Photoshop** are powerful enough tools to add saturation and contrast to your images.

And it's true, I'm not going to deny that both are very powerful.

But... It's really complicated to replicate the effect of a circular polarizing filter in post-processing. And if you want to reduce any glare and haze in a scene, that's just impossible.

What are the drawbacks of using a polarizing filter?

Unfortunately, polarizing filters have a number of disadvantages and problems.

Here are some things you should be aware of:

- A polarizing filter can ruin the sky in your shot. If you use a polarizer with a wide angle lens during a Sunrise or Sunset it can make the sky appear unnaturally dark in certain areas. This is also true for panoramas. Be very careful when making panoramas: any problem or effect caused by the polarizer will be almost impossible to correct in post-processing.
- It'll take you longer to compose if you use a polarizing filter because you need to rotate it carefully until you get the effect you're looking for. Don't forget that the polarizing effect of the filter varies greatly depending on the position of the Sun and the direction in which you're pointing the camera.
- A polarizing filter subtracts light from the scene. Depending on the model, it can be between 1 and 3 **stops** so you need to take this into account when setting the shutter speed.
- A polarizer can cause vignetting. This is especially true if you use a wide angle lens because vignetting will affect the corners of the frame. To avoid this, you shouldn't stack too many filters and only buy slim or nano polarizing filters.
- A polarizer may produce flare or halos in the final image.
- For any polarizer, a rainbow is reflected light. If your polarizing filter is engaged, the rainbow will disappear from your photo. Rotate or remove the polarizer.
- Finally, a quality polarizing filter is expensive. Instead of buying many different sized filters, I recommend that you buy the largest diameter filter you can screw onto your bigger lens. Then, buy adapter rings for all the other lenses you have. That way you can use the same filter with all your lenses.

Despite these drawbacks, I believe that a circular polarizing filter (CPL) is an essential accessory in the backpack of any photographer (especially landscape ones). With a high quality filter and a little practice you can get spectacular results.

And not only that.

Remember you can't replicate the effect of a circular polarizing filter (CPL) using any post-processing software. If you don't get it on camera while in the field, you won't get at home in front of the computer.

Also, as you'll learn in **section 11**, you can stack the polarizer with other filters such as ND or GND ones for spectacular results.

I use the **B+W Kaesemann Circular MRC 77mm** polarizing filter. I also have the **112mm Slim circular polarizer from Lucroit** and the **165x165mm square polarizer from Lucroit**.

The most popular brands are Lucroit, B+W, Formatt-Hitech, NiSi, Lee, Hoya, Haida, Cokin, Breakthrough and Singh-Ray.

Gold-N-Blue (Singh-Ray) and Varicolor Blue/Yellow (Cokin) polarizer

photopills.com

Now that you know what a circular polarizing filter is and what it's for, let me surprise you by explaining a few things about the **Gold-N-Blue circular polarizing filter (Singh-Ray)** and the **Varicolor Blue/Yellow de Cokin**.

At this point, you know that "regular" polarizers enhance color saturation on your images and also reduce or eliminate reflections (as long as they are not metallic).

But can you imagine that besides that the polarizer gave the sky or the water a warm and golden tone? Or a cold blue tone?

Nikon D700 | 105mm | f/8 | 1s | ISO 200 | 8000K | Regular polarizer

Nikon D700 | 105mm | f/8 | 0.5s | ISO 200 | 8000K | Gold-N-Blue polarizer

The difference in tonality will depend on the direction you rotate the filter. Instead of eliminating reflections, this filter colors them with an intense blue or yellow tone as you rotate the filter.

I know what you're thinking: you can do the same with a color filter.

Note: *In case you don't remember, a color filter is used in analog photography, and more specifically in black and white photography. Depending on the color of the filter, greens, blues or reds are enhanced.*

But they're also used in digital photography to change the color of a portion of the scene or the color temperature.

Back to the color circular polarizing filter...

The truth is that you don't get the same result with a color filter.

First of all because the materials' quality is not the same (a color filter is usually of low quality and very cheap compared to any polarizer), so the effect can hardly be the same.

And secondly, because any polarizer will always increase the contrast of the image, while a color filter will not.

However, you'll have to spend part of your savings in exchange for getting this nice effect on your photos...

But before you get your hands on a color polarizer, you should also know its drawbacks:

- It's a (very) expensive filter compared to a high quality "regular" polarizer (the CPL I told you about in the previous section).
- It's not easy to use this filter. Because it's a screw-on filter, you can't use with any filter holder. If you also need to use an ND or GND filter at the same time, you'll have to handhold them in front of the lens.
- It produces a quite strong vignetting, so you shouldn't use it with other filters as you'll accentuate the vignetting.
- The filter has a strange effect on the color temperature of the photo. Don't use the auto white balance. Use the "try and fail" method and adjust the white balance manually. If you make a mistake, you can always correct it later on in post-processing.

Neutral density filters (ND)

A neutral density (ND) filter is a piece of glass or semi-transparent resin that you place in front of the lens.

It allows you:

- Increase the exposure time.
- Use a very large aperture (small f number).

The idea in both cases is to get spectacular effects in your photos.

What do you get with an ND filter?

The first picture was taken without an ND filter. In the second one, you can see how the ND filter allowed me to increase the exposure time creating a nice silk effect in the moving water.

In **'Exposure in Photography: The Definitive Guide'** I explain in depth **how to use ND and GND filters**. You should definitely read this section and the complete guide carefully. Both are going to be very helpful ;)

Straight to the point...

The ND filter allows you to evenly reduce the light that reaches the sensor. It allows you to subtract light (always evenly, remember). This helps you capture certain effects without overexposing the scene:

- You can slow down the shutter speed to create beautiful effects without overexposing the brightest tones. It allows you, for example, to capture a silk effect in the sea during a Sunset.
- You can use larger apertures (without overexposing the scene) to capture a shallower depth of field. This is useful, for example, if you want to separate the backlit subject from the background.
- The effect you get depends on the number of **stops** you're able to subtract according to the filter you're using (1, 2, 3 stops...).

Another advantage of the neutral density filter is that since it reduces light evenly, it doesn't alter the contrast or sharpness of your image.

Nor does it introduce any color cast. Or it shouldn't because, unfortunately, it's not always the case depending on the filter manufacturer.

Nevertheless, the density of these filters is "neutral" because of this lack of color cast.

In short, they are sunglasses for your lens.

Types of ND filters according to their density

An ND filter is used to block part of the light entering through the diaphragm to the sensor. And to do that, you need to "subtract" that light precisely. That's why manufacturers offer a wide range of filters of different densities.

Here are some examples of filters, depending on their density or reducing capacity.

Stops	Light reduction	Density	Light transmission %
1	ND2	0.3	50%
2	ND4	0.6	25%
3	ND8	0.9	12.5%
4	ND16	1.2	6.25%
5	ND32	1.5	3.125%
6	ND64	1.8	1.563%
7	ND128	2.1	0.781%
8	ND256	2.4	0.391%
8 2/3	ND400	2.6	0.25%
9	ND512	2.7	0.195%
10	ND1024/ND1000	3.0	0.098%

Thus, an ND 0.3 filter reduces 1 stop the light reaching the sensor. An ND 0.6 filter reduces 2 stops, an ND 0.9 filter reduces 3 stops, an ND 3.0 filter reduces 10 stops, and so on.

Remember, each time you reduce the exposure 1 stop, the sensor captures half the light.

Therefore, a filter allows only $1/(2^{power})$ of the initial light to go through it. In this case, "power" is the number of stops that the filter subtracts.

For example, a 6-stop neutral density filter only allows 1/64 of the light to go through your lens:

$$1/(2^6) = 1/(2\times2\times2\times2\times2\times2) = 1/64$$

Depending on the light you want to subtract, choose a more or less dense filter.

But... Be careful!

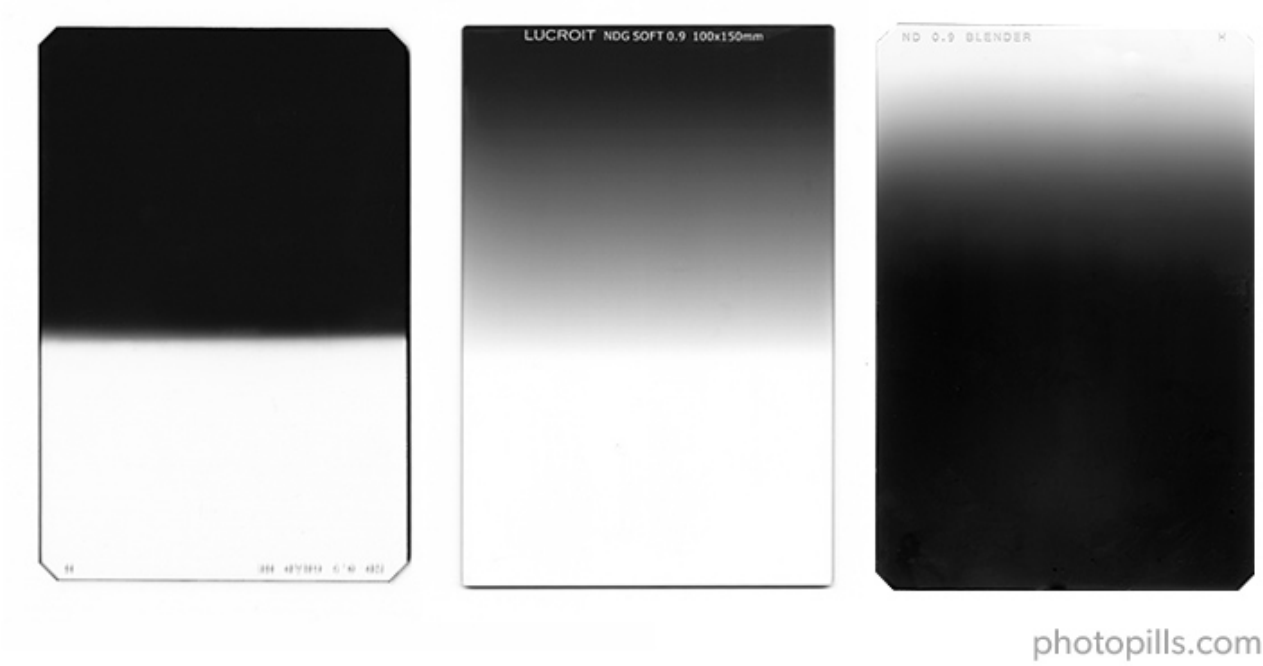
The density indicated by the manufacturer is not always the real one, so I suggest you calibrate your ND filters.

How to calibrate an ND filter?

By "calibrate" I mean "find out the actual density of the ND filter". It's a very simple process that I explain in detail in **section 3**.

Now, let's get on with the GND filters!

Graduated neutral density filters (GND)



A graduated neutral density filter (GND) is a piece of glass or resin that you can place in front of your lens.

But, unlike ND filters, the density of these filters varies gradually on their surface (they aren't uniform).

What do you get with a GND filter?

GND filters don't subtract light evenly on all surfaces. As its name suggests, they subtract it gradually. This means that there are certain areas of the filter that subtract more light than others.

So you can decide on which area of the frame you want to subtract more (or less) light. This is particularly useful in scenes where the light gradually changes within the frame. For example, in scenes where the upper area is brighter than the lower area. Or one side has more light than the other.

By placing the darkest area (the one that subtracts more light) over the highlights of the frame, your camera is able to correctly capture a high contrast scene. In other words, with just one shot you'll be able to capture detail in both the highlights as in the shadows.

Without the GND filter, the highlights will probably be blown out or the shadows will be clipped. You have to decide whether to correctly expose one area or another.

With the filter you can darken the brightest area, so that the difference between the brighter and darker areas is smaller. Therefore, you'll be reducing the **dynamic range** of the scene.

Nikon D4s | 110mm | f/11 | 1/60s | ISO 100 | 5850K | Soft GND 0.9 (3 stops) filter

They are called graduated neutral density filters because:

- Their density varies gradually, subtracting light gradually.
- From the bottom edge of the filter to the center, this gradual variation goes from trans-

parent to a neutral gray tone.

- From the center to the top edge of the filter, this gray's density gradually increases, subtracting more and more light.

To summarize, they are sunglasses for your lens whose crystals have a progressive tint.

Although some photographers consider that filters are an artificial tool that alters reality, the truth is that a graduated neutral density filter helps you get just the opposite: capture a photo that is very close to what your eyes see.

There is another lesser-known advantage of GND filters: they allow you to increase local contrast. In other words, the detail and color of the image are improved.

This is because, as I told you, this type of filters reduces the dynamic range of the scene. One thing is linked to the other.

Let me explain it in detail.

And in order to do it, I have to refer to the **exposing to the right (ETTR)** concept.

In short, the camera doesn't capture the same detail in all tones. In fact, it always captures far more detail in the highlights than in the shadows.

This lack of information in the shadows makes it the area of the image where your get noise first and where you get less contrast. If you reduce the **dynamic range** of the scene, the shadows will become brighter, the sensor will capture more information, and the contrast will be higher.

You don't have to use a GND filter in extreme situations: you can also use a GND filter in scenes where the dynamic range doesn't exceed that of your camera. Imagine a spectacular sky full of clouds. The filter can accentuate the detail of the clouds, or it can darken them and increase their clarity compared to the rest of elements.

Actually, as you'll see later on in **section 17**, their uses are (almost) endless.

But before explaining real examples, let's take a look at the different GND filters that you can find on the market.

Types of GND filters according to their density

Remember that the GND filters mission is to control how much light you want the sensor to capture. So, depending on the amount of light you want to subtract, you should choose filters of different densities.

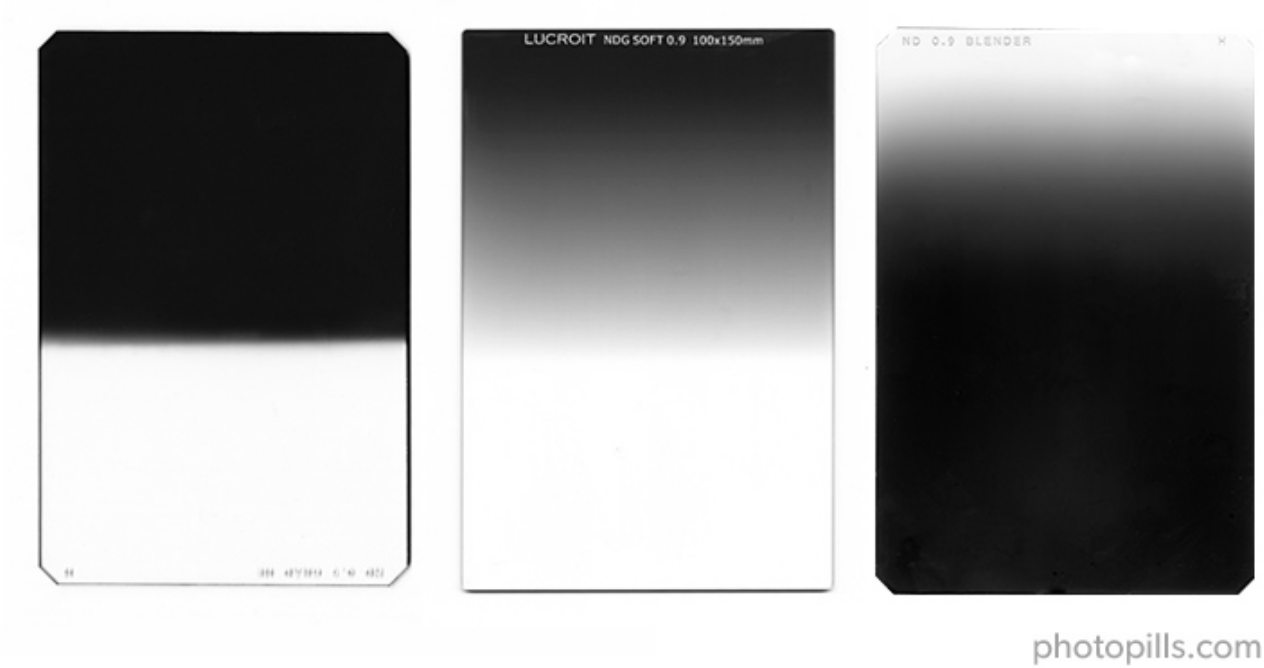
The most popular filters have 2, 3 and 4 **stops**. In the table below you have the naming according to the filters brand.

Stops	Light reduction	Density
1	ND2	0.3
2	ND4	0.6
3	ND8	0.9
4	ND16	1.2
5	ND32	1.5

Types of GND filters according to the transition

Not all filters have the same transition from the darkest part to the clearest or more translucid part.

The transition can be hard, soft or diffused.



Hard filter - Soft filter - Blender (diffused transition)

Hard graduated neutral density filters

In hard filters the transition between the dark and the transparent part is clearly marked with an almost perfectly defined horizontal line.

You can see it perfectly if you hold a filter with your hand and put it in front of a light source.

They will be very useful when your scene has a clean horizon (i.e. there are no elements above the horizon). Or when the scene has a clearly visible straight line separating light and dark tones.

Soft graduated neutral density filters

In soft filters, on the other hand, the transition is gradual: the dark part gradually becomes transparent.

These filters are ideal when you have elements above the horizon. In other words, when you can't see a clearly visible straight line in the scene that separates the brighter tones from the darker ones.

A soft GND is also ideal to use it over the sky during **Sunrise** or **Sunset**. When you have soft clouds during Sunrise or Sunset, they are barely colored. Thanks to the graduated filter, you can have much more saturated clouds.

Unfortunately, filter manufacturers don't agree on standard gradient values (i.e. how fast the filter changes from dark to transparent). So the filter gradient can vary significantly from brand to brand.

Blenders (diffused graduated neutral density filters)

A blender filter is completely dark at the top (almost as if it were an ND filter) and completely transparent at the bottom. The difference with the previous two is that the density gradually changes along the entire length of the filter.

In other words, if you look closely you won't see a "border" or a "transition zone" between the darkest and brightest part.

This type of filter is not very popular, but is very useful in scenes where there is a wide **dynamic range** but the highlights and the shadows are not clearly separated.

If you're shooting in a forest, for example, this filter is ideal. The light is filtering through the treetops while the trunks completely stop the light from passing through.

What is the disadvantage of using graduated filters?

A graduated neutral density filter may limit your composition.

Yes, it can.

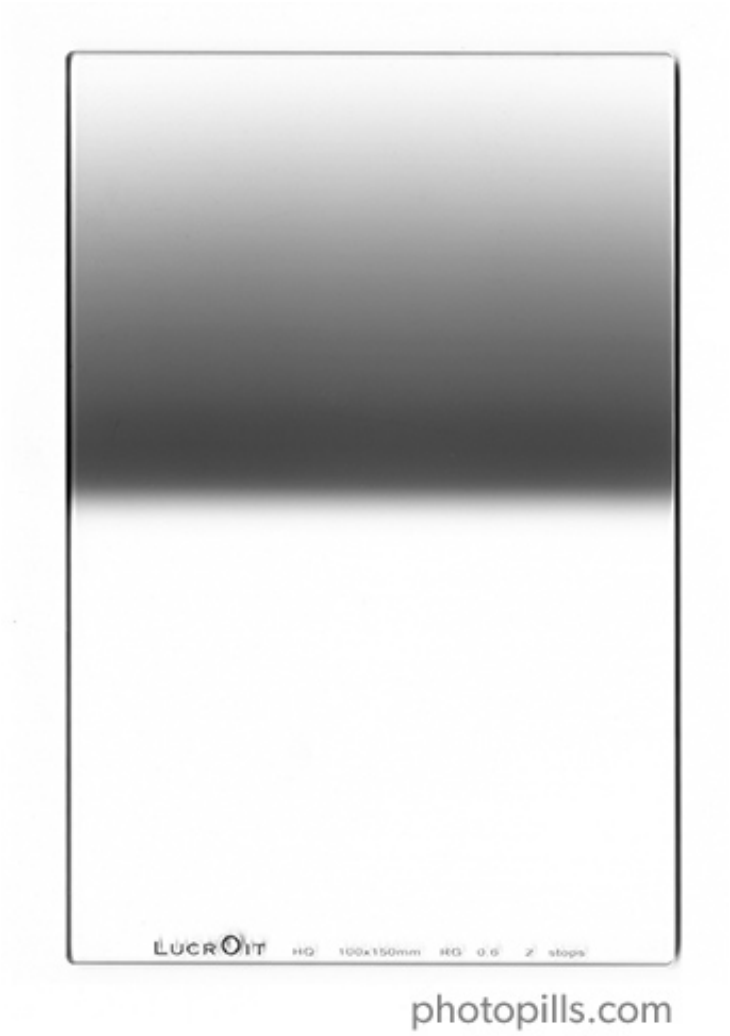
The problem is that all (or some) elements above the horizon may appear in the final image darker than the rest of the scene.

You can solve this problem with a post-processing software like **Photoshop**. But in order to do so, you must know how to use luminosity masks, for example.

However, you should ideally avoid, if possible, using additional tools. I don't think you'd rather spend more time in front of the computer than taking pictures.

If you're interested in buying a graduated filter, these are the most popular brands: Lucroit, NiSi, Lee, Benro, Hitech and Haida.

Reverse graduated neutral density filters (reverse GND)



The reverse graduated neutral density, or reverse GND filter, is a variation of the graduated filter.

Its peculiarity is that the darkest part, the one that determines the filter density, is in the middle of the filter, and it progressively brightens towards the top. On the contrary, the lower half is completely transparent (to avoid subtracting light in the foreground).

That's why it's called reverse.

What do you get with a reverse GND filter?

You can mainly use it for photographing backlit Sunrises and Sunsets with a clean horizon (without elements above).

Imagine you're on a beach trying to capture a beautiful Sunset.

The Sun sets creating a strong light and you decide to adjust the exposure so that the highlights (i.e. the Sun) aren't blown out in the **histogram**.

Nikon D4s | 28mm | f/11 | 4s | ISO 100 | 8100K | ND 1.8 (6 stops) filter

As you can see, the problem is that the sky looks great but the rocks are very dark. Too dark...

So you can try to change the exposure and adjust it to the shadows so that they don't turn out so black.

And that's ok. The problem is that by making this decision you've decided to sacrifice the highlights and now they are completely blown out. Not even your favorite software is able to recover them: the RAW doesn't have that information and that area of the photo is completely white.

Nikon D4s | 28mm | f/11 | 10s | ISO 100 | 8100K | ND 1.8 (6 stops) filter

"But Toni what if I fix it with a bracketing?"

A **bracketing** can be incredibly useful on many occasions. But not always..

Unfortunately, in this case you have to take into account a small detail: the movement of the water. No matter how hard you try, you'll never get 2 (or 3 or whatever) totally identical shots whose only difference is the exposure.

So it will be very (very) difficult to merge them later in **Photoshop** without halos and other elements that distort the image.

Be careful. I'm not saying it's not possible. It's just complicated.

Another option can be to use a soft (or even hard) GND filter to balance the exposure of the scene and use the dark part to mitigate some of the highlights.

Nikon D4s | 28mm | f/11 | 4s and 10s (2-shot bracketing) | ISO 100 | 8100K | ND 1.8 (6 stops) filter

However, the resulting photo isn't exactly what you're looking for, is it?

The top of the sky is too dark while the Sun doesn't have enough detail. The overall exposure of the image still doesn't match what your eyes see.

Let's go back to the first shot you took and let's identify the bright and dark areas.

Using the light map as a reference, compare it with the effect of a soft GND filter and a re-

verse GND filter.

Can you see the problem?

In this case you're facing a scene where the horizon is almost straight and you have hardly any obstacles.

When you try to capture a **Sunrise** or **Sunset**, the brightest (or clearest) part of the scene is not at the top of your frame. If so, a soft GND filter would be perfect.

The brightest part of your scene is in the middle of your frame.

Now, look at the diagram above and have a close look at a reverse GND filter. You can clearly see that the darkest part of the filter (the one that helps you counteract the brightest part of the frame) is right in the middle.

And when you use it... it works like magic!

Nikon D4s | 28mm | f/11 | 13s | ISO 100 | 6250K | ND 1.8 (6 stops) and soft reverse GND 0.6 (2 stops)

So as you can see, a reverse GND filter can be a very useful tool in certain situations.

If you're interested in buying a reverse degraded filter, these are the most popular brands: Lucroit, Nisi, Benro, Lee and Haida.

Black card

A black card is actually nothing more than that. It's literally a piece of black card or any dark element that has a smooth, flat surface.

What is it for?

Very simple: to cover (totally or partially) the lens during the shot.

You can do this either if the lens is "naked" or if it has one or more filters in front of it.

What do you get with a black card?

Basically blocking light :)

For example, if you're photographing a lighthouse, you can use a black card to cover the lens each time a beam of light hits the lens.

But you don't always have to cover the lens completely. With a bit of skill, a black card allows you to control the exposure of that specific area of the scene where the highlights are too bright. You'll avoid blowing them out and your camera's sensor will capture enough information in the RAW file.

What are the drawbacks of using a black card?

The first and most obvious one is the lack of precision. It's a task you'll have to do manually. Remember that you will be handholding the black card (without the help of a filter holder) in front of the lens.

What does that mean?

On the one hand, you'll have to use the "try and fail" method to know how long you have to cover the lens.

On the other hand, you'll have to adjust the position of the black card. In other words, which part of the frame you want to cover. And be careful, because you'll have to make sure you move the black card slightly during the exposure to avoid having a black strip in your photo.

Moreover, depending on the shutter speed you're using, you may need to cover two sections of your frame.

Actually, you set the limits ;)

The second drawback is that it's a technique that you'll only master by spending time practicing.

It's a craft, not a scientific technique so the results are not guaranteed. You'll have to try and see the results.

Infrared filter

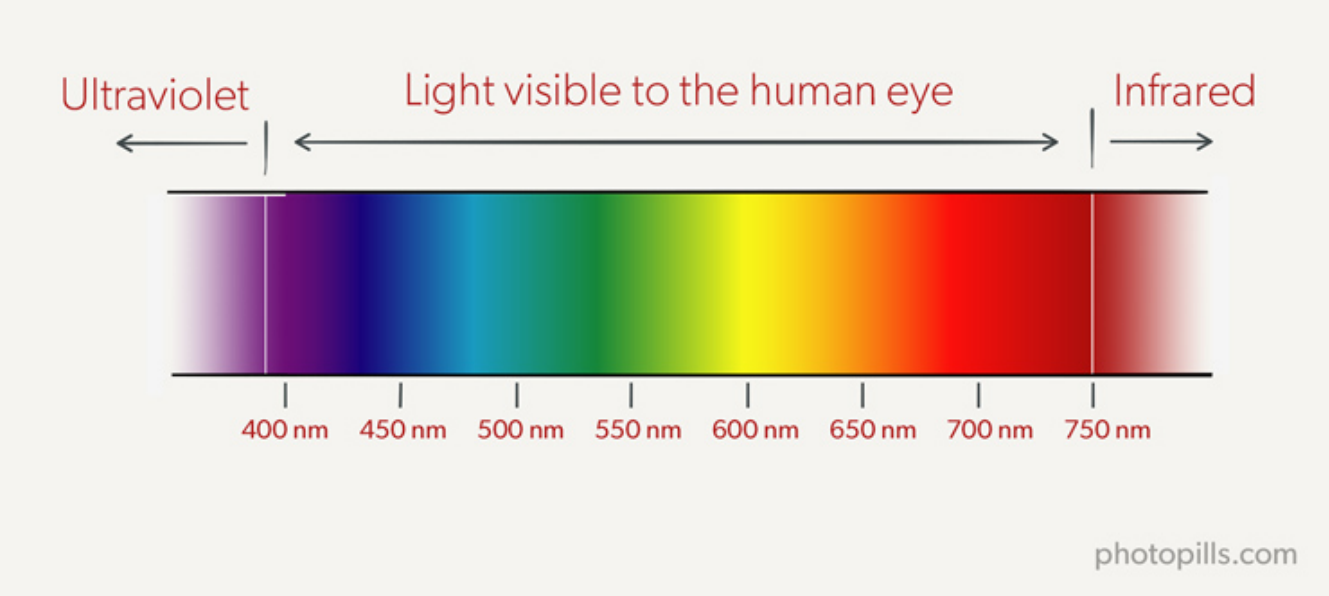
What is infrared photography?

Infrared photography produces very interesting, generally impressive and incredibly creative results, as the objects in a scene reflect infrared light very differently from normal light.

In order to get these results you need (surprise!) an infrared filter. This filter is specifically designed to block visible light. That is, the light your eyes see and the light your camera's sensor is able to capture.

So it only allows infrared light to go through the lens and reach the camera's sensor.

To give you a simple explanation, the light you're able to see with your eyes is between 390 nm and 750 nm within the **electromagnetic spectrum**. Everything outside that range is "invisible" to you. This includes infrared, gamma, X, ultraviolet, microwave and radio waves.



Types of infrared filters

Just like the other filters, an infrared filter can be circular screw-on or square. Here, we are talking about external filters.

There are many models of **external infrared filters**, although the most common one is the standard infrared 720 nm (RM72) which is the one I use.

But there are also **internal infrared filters**. That is, a filter that you can put directly on the sensor as I did with my Nikon D300.

Actually, I asked a professional do it. The first time I tried to do it myself with a Nikon D70 and I broke it... XD

I learnt the lesson and decided to send my Nikon D300 to **Lifepixel** (a US company) to put a standard internal infrared filter.

Check that your camera can take infrared photos

Before you buy an infrared filter, make sure your camera can take such pictures. You can do a very simple test to confirm it.

Turn on your camera and put it in Live View mode. Grab the remote of your TV, point it at your camera and press several buttons on the remote.

If you're able to spot a bright red dot on the LCD screen, your camera can capture infrared light correctly.

If the red light is dim, your camera can capture infrared light. But you will need a very slow shutter speed because the sensor has a very powerful filter against infrared light.

Finally, if you don't see any red dots on the LCD screen, your camera is not capable of capturing infrared light.

Check that your lens is suitable for infrared photography

One more thing.

Not all lenses are suitable for infrared photography. This is due to certain optical problems. But I don't want to go in depth in Optics and Physics matters, so I'll leave it here.

The only thing you need to know is if your lens is suitable or not. **This complete database will help you solve the issue**.

Light pollution filter

Sodium vapor bulbs are generally used in all types of public (streetlamps) and industrial lighting. They're one of the most frequent sources of light pollution.

This type of bulb has a yellow to orange glow that modifies the color temperature and significantly reduces the contrast of a night photography.

A light pollution filter allows you to prevent artificial lights in urban centres from affecting your night photography or astrophotography.

Nikon D4s | 35mm | f/1.8 | 6s | ISO 100 | 6400K | Pure Night light pollution filter on the second picture
Can you notice the difference?

It's usually made of **didymium glass**. This material is capable of reducing the yellow and orange glow in such a way that the color temperature and contrast of your pictures are closer to reality.

If you've ever tried to take pictures of the **Milky Way** or **Star Trails**, you've seen the horrible effects of light pollution. I'm sure your photos have a sky with an orange cast that ruins everything, reduces contrast and doesn't let you perceive the real color of the stars.

Once you use a light pollution filter you'll see the difference. I have the **Pure Night** filter designed by **Ian Norman** and since I bought it, I always carry it in my backpack whenever I go out to take pictures at night.

Solar filter

A solar filter is specially made to photograph the Sun or a solar eclipse.

Don't risk damaging your eyesight and equipment by using some cheap filter or one not designed for looking directly into the Sun.

Your filter must also block infrared (IR) and ultraviolet (UV) light as well which, though invisible, can also damage your eyes.

What are the different types of solar filters?

There are three types of solar filters for photography:

- Aluminized Mylar®
- Metal-coated
- Black-polymer (usually handheld)

All the filters can be:

- Circular or square.
- Mounted in a metal cell, making it very easy for you to clamp them over your lens and adjustable to different diameters.

How are you going to see the Sun through a solar filter?

Aluminized Mylar® filters are the most expensive ones. However, they provide a white Sun which is true to the Sun's real color (Surprise! It's not yellow).

Don't be deterred by their wrinkled surface. This surface tends to scatter light a little bit.

But these filters are actually very sharp. They're particularly good for highly magnified images.

Metal-coated glass filters and black polymer filters result in a saturated yellow Sun. Any of them will work fine, since you can always change the color of the Sun later on, in post-processing.

Finally, metal-coated glass filters offer you a sharper picture than black polymer filters which are more appropriate for naked eye observation and wide-angle images.

Don't use homemade filters!

According to NASA, the following materials should never be used to view a solar eclipse:

- Photographic polarizing filters
- Sunglasses of any kind
- Negative film (exposed or not)
- Smoked glass

- Space blankets and other forms of household Mylar, or silvery CD/DVD disks
- Medical X-ray film
- Floppy disks

You must avoid them because, while they dim visible light, they don't block infrared (IR) and ultraviolet (UV) light that can damage your retinas.

If you want to photograph a solar eclipse, I suggest you study **'Solar Eclipses: The Definitive Photography Guide'**.

The only problem is that a total solar eclipse is not very frequent. But you can always capture a lunar eclipse: **'Lunar Eclipses: The Definitive Photography Guide'**.

Section 3:

How to figure out the real density of your ND filter with PhotoPills

Sometimes when you buy an ND filter the density indicated by the manufacturer is not exactly the one the filter actually has. The manufacturer may indicate that the ND filter has a density of 10 stops, but in fact it's not. It may be 10 stops and ¼!

This factory defect can be problematic when you're calculating the **exposure**, because despite applying the **reciprocity law**, correctly, you don't get the correct exposure while you're using the filter.

But don't worry, there's a way to fix it :P

To get the first exposure right, you should use **PhotoPills** to calibrate all your ND filters beforehand. That is, finding out exactly their density, or the stops that the filter actually subtracts.

In order to do this, just follow these steps.

Create constant light conditions in a room

Pick a room at home, close the door and the blinds (or curtains) and turn on the lights. You have to create constant light conditions.

Take a test shot with the correct histogram

Unfold your tripod and mount the camera on it. Without using the filter, take a test shot of the room with the correct **histogram**, where the picture is correctly exposed. Once you have it, write down the settings (aperture, speed and ISO). These will be the test settings that you'll use in **PhotoPills**.

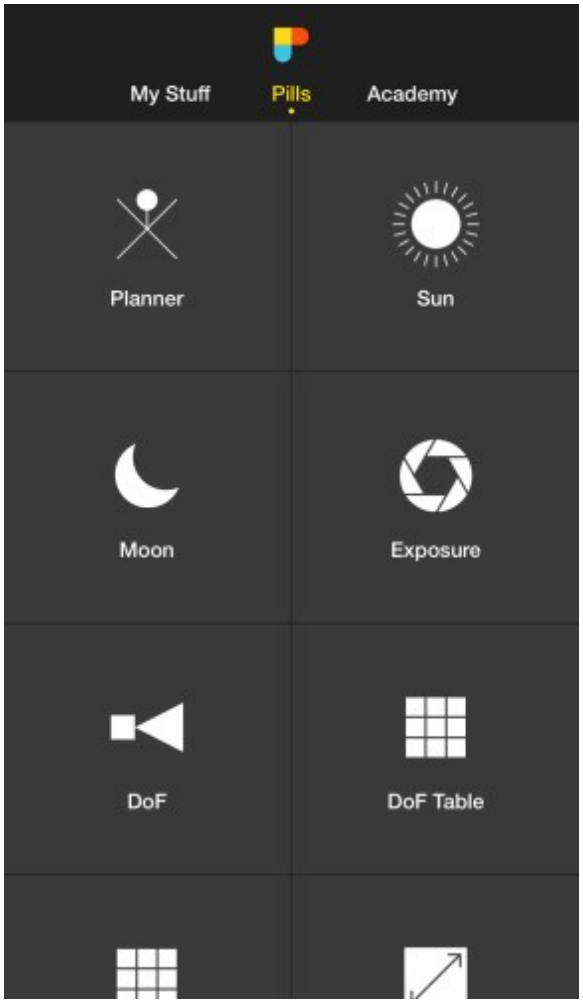
In the test picture below I used an f/4 aperture, a shutter speed of 1 second and ISO 100.

Nikon D4s | f/4 | 1s | ISO 100

Use the exposure calculator

Open **PhotoPills** and tap on *Exposure* (*Pills* menu). This takes you to the **long exposure calculator** it will help you to find the real density of your filter among other things.

In the long exposure calculator, tap on *Calculate* at the top of the screen, and choose *Shutter speed* as the setting you want to calculate.

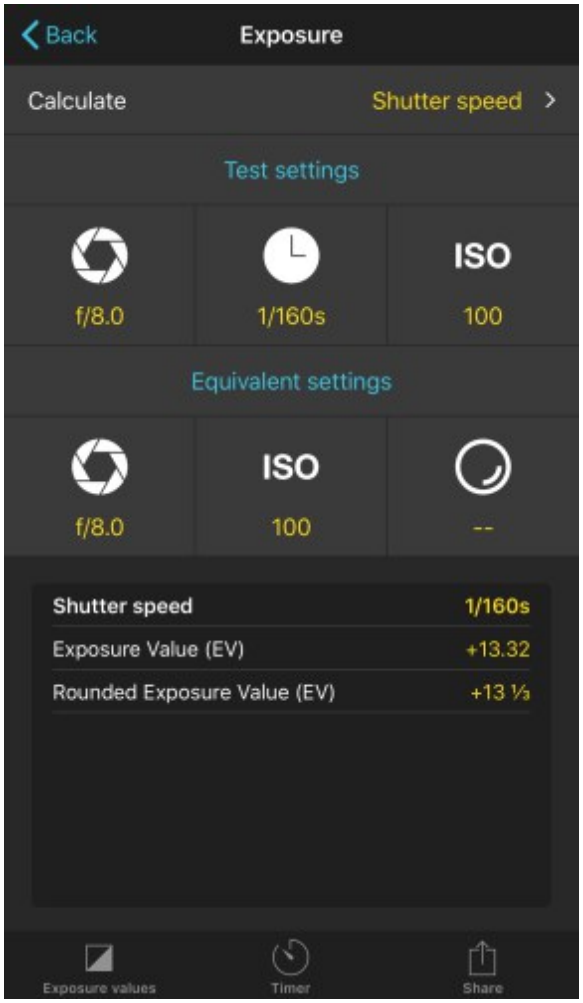


PhotoPills - Pills Menu. Tap on Exposure to open the long exposure calculator.

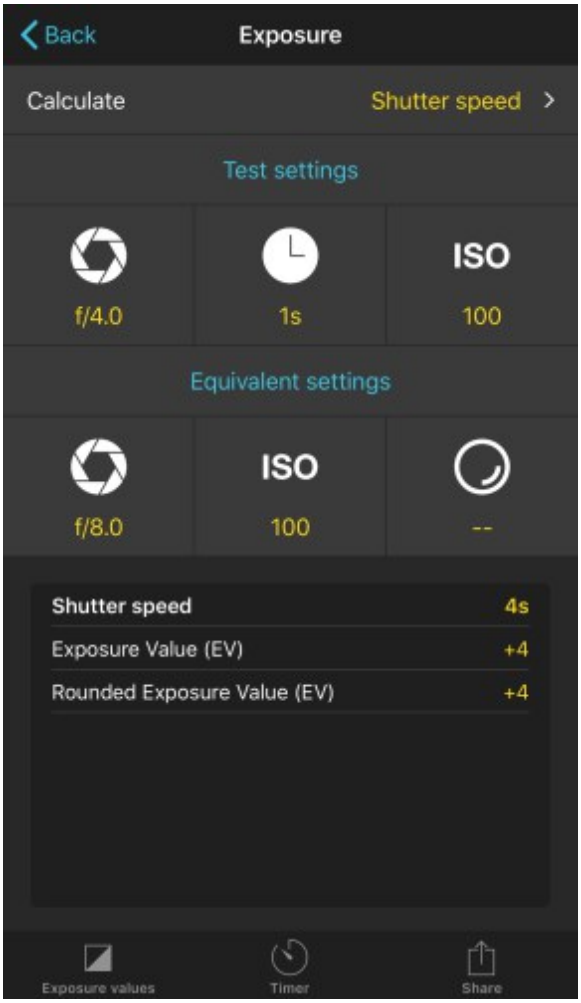
PhotoPills - In the long exposure calculator, set that the setting you want to calculate is the Shutter speed.

Enter the test settings

In the exposure calculator, enter the *Test settings*. That is, the aperture (f/4), shutter speed (1s), and ISO (100) of the test shot (the correctly exposed picture of the room).



PhotoPills - Long exposure calculator once you've set the Shutter speed as the parameter you wish to calculate.

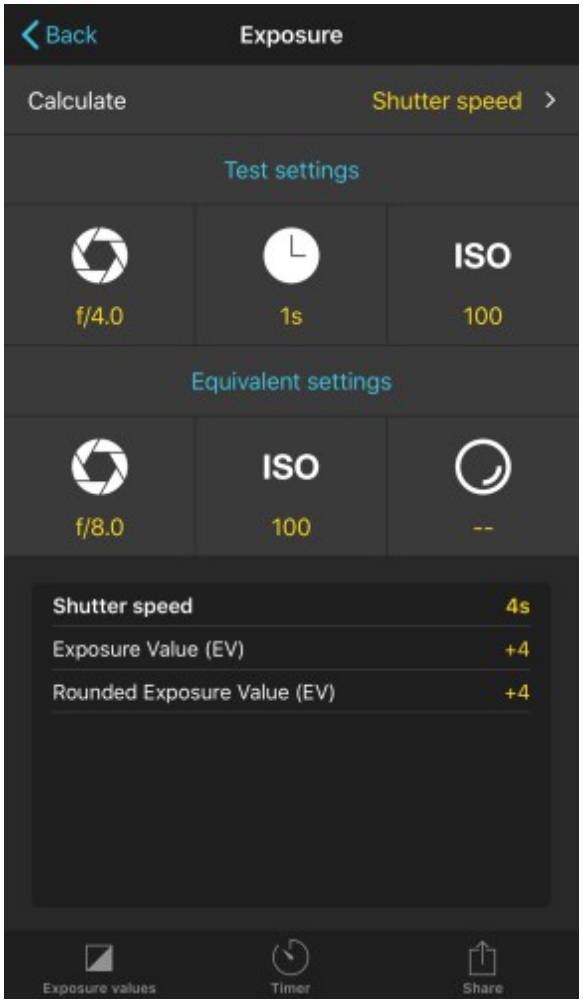


PhotoPills - Enter the Test settings in the long exposure calculator (aperture, speed and ISO). In the example f/4, 1s and ISO 100.

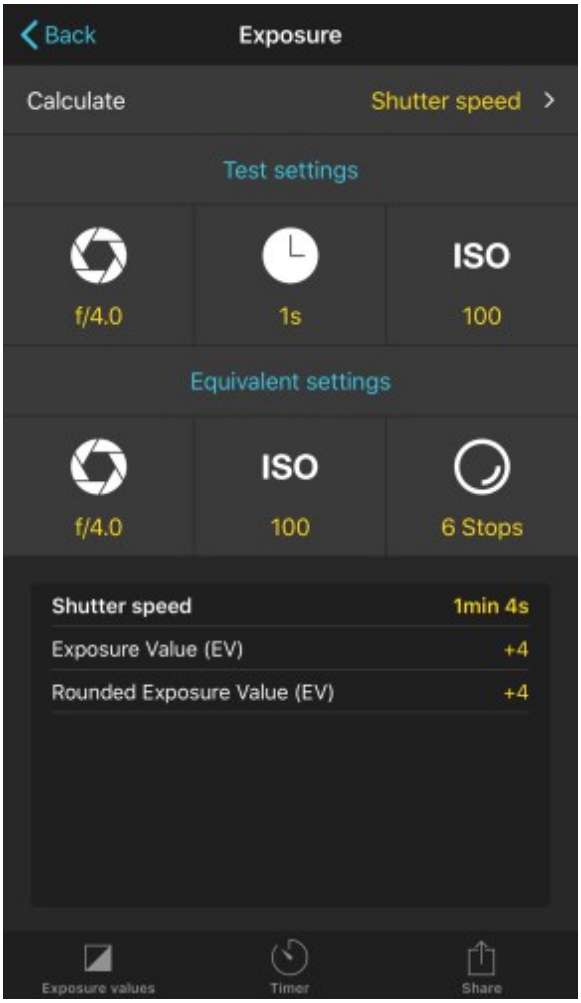
Enter the equivalent settings

Now, in the *Equivalent settings*, enter the same aperture (f/4) and the same ISO (100) of the test shot. Finally, enter the stops that your filter subtracts according to the manufacturer. In this case, I used a 6-stop Haida filter.

Once you've entered the settings, the equivalent shutter speed (1min 4s) is the first result shown in the table below. This is the shutter speed you're going to use to take a second shot but this time with the filter on.



PhotoPills - Long exposure calculator after entering the Test settings in the long exposure calculator (aperture, speed and ISO).



PhotoPills - Enter as the Equivalent settings the aperture (f/4), ISO (100) and the stops of your filter (6 stops). And get the shutter speed you're going to use in the results table (1min 4s).

Put the ND filter and take a test shot

Place the filter holder on the lens and insert the ND filter you want to calibrate. Enter the aperture (f/4), ISO (100) and equivalent shutter speed (thanks to the long exposure calculator you know it's 1min 4s). Take a test shot.

Nikon D4s | f/4 | 64s | ISO 100 | ND 1.8 (6 stops) filter

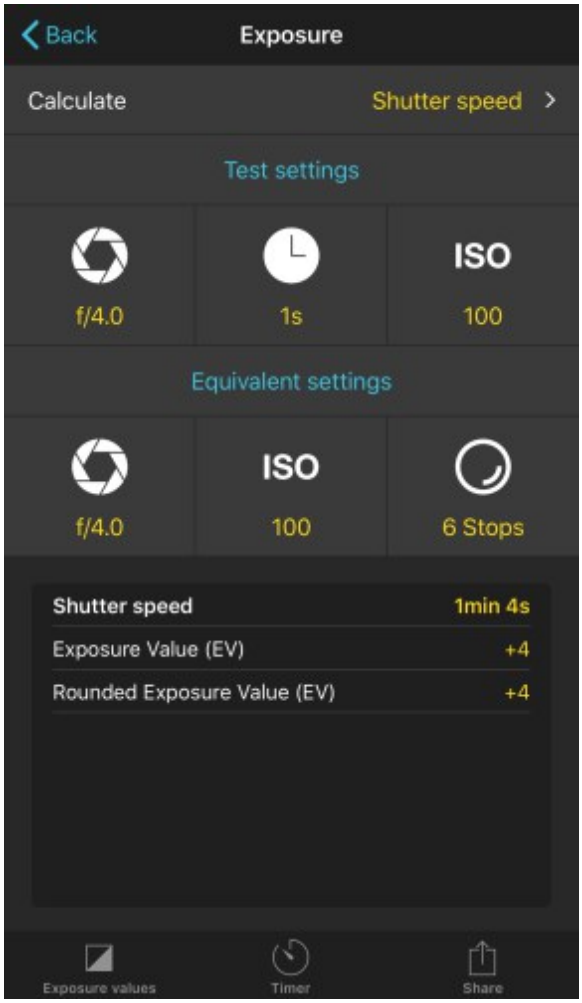
Look at the **histogram** of this last test shot, the one you took with the filter, and compare it with the one you took without filter. If they're almost identical and you can overlap them, the filter density labeled by the manufacturer is valid.

If the second histogram has moved to the left compared to the first one (darker picture), your filter has a higher density than what the label says. Conversely, if the second histogram has moved to the right compared to the first one (brighter frame), your filter has a lower density than what the label says.

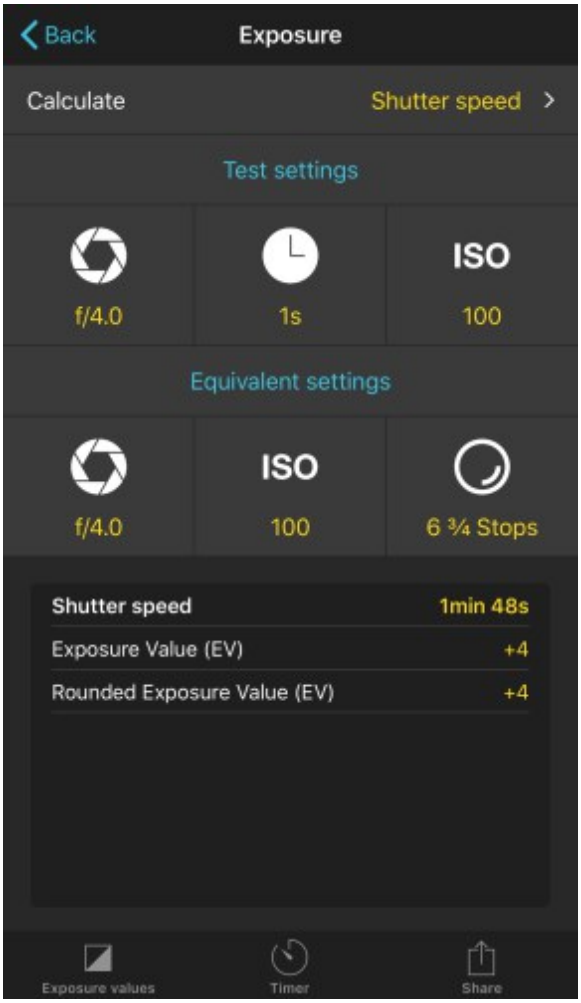
Modify the settings according to the exposure

Imagine that the second test shot is darker. In other words, the filter subtracts more stops than what the manufacturer indicates. In that case, reopen the **PhotoPills** long exposure calculator and add a fraction of stop to the filter density. In this example I will add 3/4 to the 6-stop filter.

This will give you a new shutter speed (1min 48s).



PhotoPills - Exposure calculator after entering the Equivalent settings of the aperture (f/4), ISO (100) and the stops of your filter (6 stops).



PhotoPills - Enter the Equivalent settings, that is the aperture (f/4), the ISO (100) and the stops of your filter plus a certain fraction (6 3/4 in this example).

Take the picture

Take another picture with the new shutter speed you just calculated and repeat the process. Compare the resulting **histogram** with the initial test shot you got.

Up: Nikon D4s | f/4 | 1s | ISO 100
Bottom: Nikon D4s | f/4 | 108s | ISO 100 | ND 1.8 (6 stops) filter, actual density 6 3/4 stops

If they match, bingo! You now have the actual density of your filter.

Sometimes, as in this case, there may be a color temperature difference due to the filter color cast. But this has no impact when calibrating your filter. Remember that it's something you can easily correct in post-processing.

If they don't match, repeat the process by modifying the stops the filter subtracts in the long exposure calculator until you find the actual density of your filter.

Put the "try and fail" technique into practice!

And so you don't forget it, you should write down all the actual densities of your filters. You can do it on your smartphone. Or if you prefer, on a piece of paper, laminate it and put it in your filter bag (or in your backpack).

This way, you'll always have it with you when you're in the shooting location and you have to make the appropriate adjustments.

Use the long exposure calculator to calculate the shutter speed

Finally, once you've determined the exact density of your filter, and whenever you want to use your filter, use the **PhotoPills** long exposure calculator to calculate the shutter speed you need to **correctly expose your photos**. You'll save a lot of time.

I'll explain it in detail in **section 9**.

Section 4:

How to stack filters (ND, GND and polarizer)

"Hey Toni, can I stack a circular polarizing filter with a filter holder and one or more square or rectangular filters?"

Yes, my friend, it's perfectly possible and highly recommended.

By stacking the polarizer with one or more ND filters and/or one or more GND filters, the benefits of each of the filters will be reflected in the photo... This will allow you to get truly spectacular images!

But always keep in mind that the more filters you place in front of the lens, the greater the loss of quality your image will suffer.

As always, photography is a constant decision-making process! ;)

Nikon D4s | 18mm | f/11 | 140s | ISO 100 | 6500K | ND 1.8 (6 stops), soft GND 0.9 (3 stops) and polarizer filters

In the image above you can clearly see that the polarizer helped me to get more detail on the rocks of the bottom of the sea.

In addition to this, the ND filter allowed me to increase the exposure time to create a silky effect in the sea (at the bottom of the image) and in the clouds.

Finally, I applied the GND filter to the brightest part of the sky. This way my camera could capture the whole **dynamic range** of the scene and prevent the sky from being overexposed.

"Toni, please show me how to stack all the filters in front of the lens."

Here we go!

How to stack the polarizer with respect to the ND and GND filters

The mounting system depends on the manufacturer.

Some polarizers are screwed directly to the lens and so you mount the filter holder over it thanks to an adapter ring. Other systems allow you to screw the polarizer directly onto the filter holder and slide the filters on top of it using the corresponding slots.

When the polarizer is rectangular, insert it into the filter holder like any other rectangular filter: sliding it through one of the slots. Which one? The furthest one from the sensor.

Similarly, depending on the manufacturer, the polarizer may be closer or further from the sensor. That is, in front or behind the rest of the filters (ND and GND).

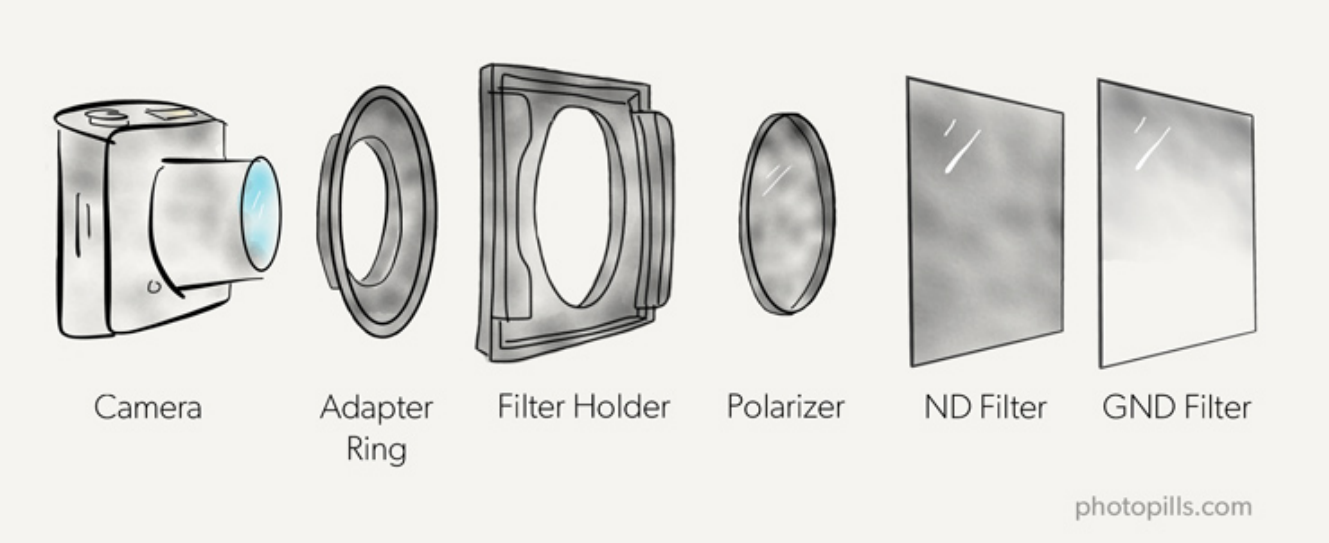
"So, do I have to follow a specific order when stacking my filters to avoid surprises?"

The answer is "yes and no" XD

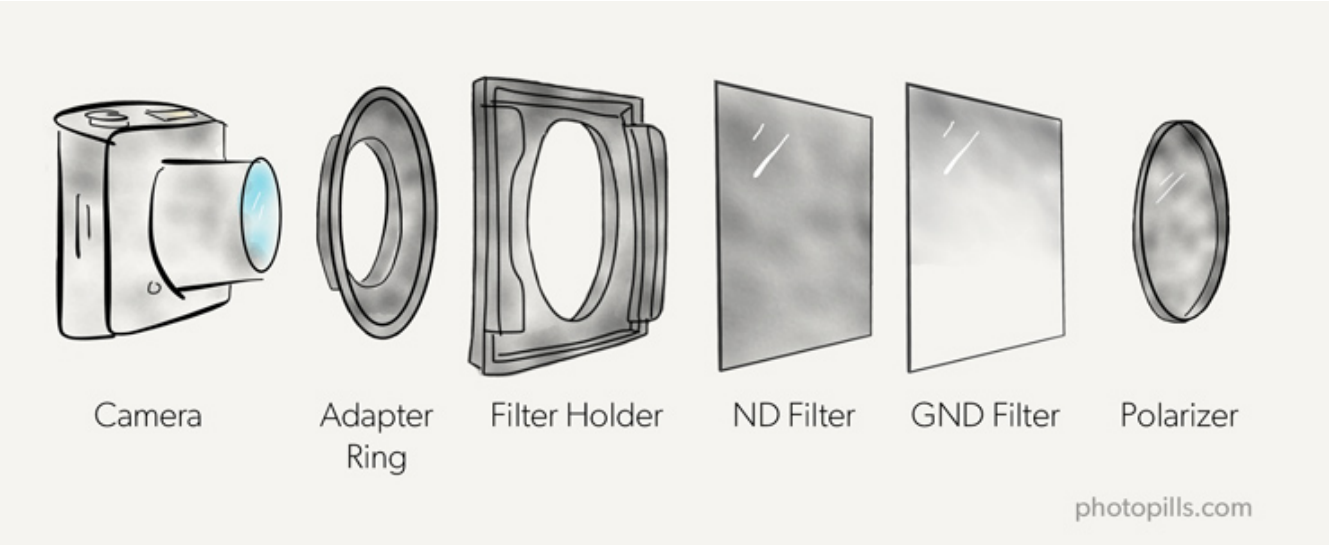
I'll explain it to you in depth below.

Regarding the polarizer, you must stack it in the first or the last position in front of the lens.

So you can use the following combinations indistinctly:



Lens > Polarizer > ND > GND (The polarizer can go before the adapter ring as well, depending on the filter mounting system)



Lens > ND > GND > Polarizer

What order should you follow to stack the ND, GND and polarizing filters?

Actually, the order depends on the filter mounting system you use.

Suppose you use a square or rectangular filter system. This would be the right order.

Be careful! Always follow the direction in which light enters through the lens. That is, from the filter that is furthest away from the sensor to the closest one.

1. **Polarizing filter.** This way, the polarizer is the first to let the light through and its effect is not affected by that of other filters.
2. **Graduated neutral density or GND filter(s).** I recommend you to put them further away from the sensor because these are filters that you're going to remove and put back or adjust inside the filter holder. Also, if you use one or more GND filters and one is a reverse GND, put the latter at the end (furthest away from the sensor) because it's probably the one you'll need to adjust most precisely. Check that the darkest portion of the filter covers the area of the scene you want.
3. **Neutral or ND filter(s).** As this filter is even, once you slide it into the filter holder you won't need to move it anymore. Moreover, it's the most light sensitive filter. So make sure it sits snugly and that the light doesn't leak to avoid any surprises.

As I told you before, you can only follow this order if your filter holder lets you to mount the polarizer in front with an adapter ring. This is the mounting system that manufacturers such as Lee or Lucroit, for example, offer.

However, there are other manufacturers, such as NiSi, whose mounting system is slightly different because the polarizer filter is the one closest to the sensor.

Over the years I have tried many brands of filters and the truth is that I haven't noticed much difference between mounting the polarizer closer to the sensor or further away. But it's still a personal opinion. If you go to any photography online forum you'll find many discussions on this topic.

The most important thing is that the filter holder lets you to insert and slide the GND filters with ease. After all, they're the ones you'll be spending more time with during the shooting preparation, and the ones you'll need to adjust more precisely to avoid unnatural dark stripes on the picture.

What are the effects of stacking and/or combining filters?

If you have, for example, more than one ND filter, you can stack two (or more) filters to increase the number of stops and let less light go through the lens.

You'll understand it better with an example: if you have a 3-stop ND filter and you stack it with a 6-stop ND filter, you're simulating the effect that a 9-stop filter would have (6 + 3 = 9).

The problem you face when stacking filters is that for every filter you add, you're adding one more obstacle to light. That is, it has to go through more glass or resin objects until it

reaches the sensor. So you have a higher risk of getting a less sharp image or with more chromatic aberration.

Moreover, most filters generate some color cast (resin ones do so more than glass ones). When stacking several filters, take a closer look at the effect it produces on the image because the more filters you put in, the more color cast your photo is likely to have.

Perfect!

After this explanation on filters, which I hope you've used as a warm up, the fun is about to start!

Will you come with me?

It's time to search for the perfect location :D

Section 5:

The perfect location for shooting with filters (and how to find it)

Location is key.

Without a good location, it will be more difficult to get a photo that has an impact, tell a story, convey an emotion...

And even more so when we talk about locations for shooting with filters, as certain locations will give you better results than others.

When you're looking for a location, look for the following ingredients...

The ingredients of the perfect location

The location you already know

Nikon D4s | 14mm | f/13 | 20s | ISO 100 | 6500K | ND 1.8 (6 stops) and soft GND 0.9 (3 stops) filters

I'll repeat it over and over again, and that's why I'm writing this first. I've always got my best images in locations I know like the back of my hand, that I love, and that I've been photographing for a long time.

When you find a location you're passionate about, come back.

Come back again and again. Explore every single corner and work on different compositions, during different times of the year and with different weather conditions.

Little by little you'll be taking better pictures, trust me.

And if you don't, listen to **Marcel Proust** :P

"The real voyage of discovery consists not in seeking new landscapes, but in having new eyes."

Main subject

Nikon D4s | 18 mm | f/8 | 20s | ISO 100 | 7500K | ND 1.8 (6 stops), soft GND 0.9 (3 stops) and polarizer filters

As in any other type of photography (**Milky Way** or **Star Trails**, for example) it's important to include an interesting subject in your composition.

It's the best way to tell a story (your story) because that subject will be the main element. And it will also be the magnet to attract your spectator's eye.

What do you need to look at when you're scouting a location?

Look for any element in the landscape that stands out: a rock formation, a tree, a unique construction (such as a lighthouse, a ruin, a building, a bridge, etc.), a monument, the remains of a shipwreck...

As you can see, there are a lot of possibilities.

Only your imagination sets the limits! :)

Basic composition elements

Nikon D4s | 22mm | f/9 | 120s | ISO 100 | 9100K | ND 1.8 (6 stops) and soft reverse GND 0.6 (2 stops) filters

Your location has a special element that is the soul of your story.

Great!

But don't just stop there.

Go a little further and explore other possibilities that you'll find in the field (or from the couch thanks to the Internet) and that can help you emphasize the story or tell it better.

Go deeper and your image will have a much greater impact.

Use elements so you can "paint" in the frame. What elements? Lines, triangles, patterns, textures, an isolated element.

The idea here is to guide the spectator's eye so that it moves along the frame in the direction you want, emphasizing or creating an effect such as a symmetry, a certain balance or a strong contrast.

Don't be shallow and avoid what's already obvious!

It's the only way to create a completely original image.

Element conveying motion

Nikon D4s | 20mm | f/16 | 1/30s | ISO 100 | 5500K | ND 1.8 (6 stops) and soft GND 0.9 (3 stops) filters

To convey motion you need... something that's moving!

It can be a water element (a waterfall, the sea, a river, a lake, a canal, etc.), clouds, lights such as car lights... or even people moving around.

Tip: If you want to photograph a crowded area, having too many people can ruin the story you want to tell. In this case, if you take a long exposure with an ND filter for example, you can transform a crowded place into a ghost town :)

Natural landscape

Nikon D4s | 18mm | f/16 | 6s | ISO 100 | 6250K | ND 1.8 (6 stops) and soft GND 0.9 (3 stops) filters

When you look for a location, the first thing you have to decide is the type of landscape you're going to work with.

For example, do you prefer to photograph an urban landscape or a natural landscape?

Suppose you want to photograph a natural landscape. In that case, try to find a location that has one or several elements such as a strip of coastline, one or more mountains, a forest with a river, a waterfall, a lake, a field of crops... The possibilities are endless!

Let's focus for a moment on two of these elements: the coastline and the waterfalls.

Coastline

Nikon D4s | 165mm | f/16 | 1/6s | ISO 400 | 6250K | ND 1.8 (6 stops) and soft GND 0.9 (3 stops) filters

Let's start with the simplest and most obvious shooting spot: lookouts.

Yes, I know. It's the first place any photographer would go. But that doesn't mean your photo isn't going to be original (that's where your expertise comes in when you're working on your composition). After all, the lookout is there for some reason, don't you think?

Another thing you need to look at when scouting the area are cliffs. They'll give you a vantage point of view and from there it'll be easier to capture the waves crashing against the rocks. And if they do it strongly, it's even better.

But if that's not the case and the sea is completely flat, you can always go to plan B: wait for a cloudy sky and pray for some wind to move those clouds. It doesn't have to be a hurricane. If the breeze is strong enough to move the clouds, it'll be enough.

Finally, look for other elements that can add a special touch to the image. For example, a lighthouse defying the elements or an old pier whipped by the sea...

And, if the scenery and tides allow it, you can always get close to the shore to capture a spectacular foreground.

Waterfalls

Nikon D4s | 125mm | f/8 | 1/100s | ISO 400 | 5850K | ND 0.9 (3 stops) filter

The main subject of your image doesn't have to be just a big waterfall. Sometimes a detail of this waterfall can also be interesting.

Or you can include in your frame just some of the waterfall lower levels. Look at the rocks, leaves and other elements that can create an interesting foreground.

The small swirls of foam or water that run once the waterfall has passed are another interesting element that you can capture. Sometimes the rocks create small areas of water in which you can see very aesthetic movements.

Again, use your imagination. Observe for a few minutes how the water behaves and try to visualize the trace it'll leave in a long exposure.

One last thing: capture the waterfall from the side.

It can be a more interesting point of view, and can create more volume or be a less classic composition.

Urban landscape

Nikon D4s | 102mm | f/16 | 185s | ISO 100 | 5850K | ND 3.0 (10 stops) and soft GND 0.9 (3 stops) filters

If, on the other hand, you prefer to shoot an urban landscape, consider including in your frame a significant building, a busy street, a water element (such as the sea, a river, a lake, a fountain...) or any other interesting architectural element (a bridge).

Another resource widely used in urban landscapes are light trails.

Solar eclipse

Nikon D500 | 480mm | f/8 | 1/500s | ISO 100 | 7460K | Baader solar filter

If you want to photograph the partial phase of a total, annular or partial solar eclipse, you need a solar filter (**section 2**). In addition to this, you'll have to go to a location where the partial phase of the eclipse is visible.

In the specific case of a total solar eclipse, I suggest you to go to a location that is within the path of totality. This strip corresponds to the set of locations in the world from which you can capture all the phases of the eclipse and it includes, of course, totality (the moment when the Moon covers the Sun completely).

You can see the **location from which I photographed the total solar eclipse of August 21, 2017** in the next picture. We were in a beautiful vineyard in Portland, United States, which was within the path of totality.

Nikon D4s | 18mm | f/16 | 10s | ISO 100 | 5850K

Experiencing totality is priceless!

"All right, Toni, but how do I find out where the path of totality is or where the partial phase is visible?"

Very simple, use the **eclipse layer** in the **PhotoPills** Planner.

If you're curious about it, I can teach you **how to plan a solar eclipse step by step**.

Are you planning to photograph the next total solar eclipse? Then, I recommend that you take a look at **'Solar Eclipses: The Definitive Photography Guide'**.

Also, if you like lunar eclipses, you can check **'Lunar Eclipses: The Definitive Photography Guide'**.

Perfect. Now you know the ingredients you need to look for in a location to maximize your chances of success.

Now let's look at the tools you have at your disposal to find them.

Tools to help you find the perfect location

If you already have a location in mind, great!

But what if you have no idea? What if you're planning to travel to a destination you've never been to? What do you have to do to find that perfect location?

Most importantly, how can you find it comfortably at home to then work on your plan (**section 8**)?

Keep reading and you'll get the answers to all your questions...

Return to a location you already know

I know I'm a pain in the back, but I'm going to say it one more time.

A good starting point is to analyze in detail locations you've visited in the past. In other words, those sites that you've already photographed and that match with the photo idea you've imagined.

Take the time to review your photo archive and establish a list of potential locations.

Work on the pros and cons taking into account your photo idea. It won't be hard because you've been there at least once and have previous experience.

Get inspiration from external sources

Obviously, one of the first things you should do is look for locations on the Internet. To do this, here are some sources that you may find useful:

- **Instagram**
- **Flickr**
- **500px**
- **Unsplash**
- **Getty Images**

- **Shutterstock**
- **Adobe Stock**
- **Google Images**
- **Locationscout**
- **ShotHotspot**
- Travel magazines (**National Geographic**, **Condé Nast Traveler** and **Travel + Leisure**)
- Travel curated content (**Behance**, **Maptia** and **Landscape Stories**)
- Travel guides (**Lonely Planet**)
- The photography section of newspapers such as **The Atlantic**, **The Guardian** and **The New York Times**
- The Points of interest (POIs) included in **PhotoPills**
- Websites of other photographers (such as the PhotoPills Masters participating in the **PhotoPills Camp**)

Visit the sources I just mentioned and look for locations that have the ingredients you need.

And now let me reveal to you three of the tools I always use before taking my photos... ;)

PhotoPills

PhotoPills has become for several years an essential tool when imagining, planning and taking my photos. Although at this point this shouldn't be a surprise ;)

And I hope that, thanks to this guide, it'll also become an essential application for you.

The possibilities the **Planner** offers are endless. Even if you decide to plan **solar eclipses** (and **lunar eclipses**)... :P

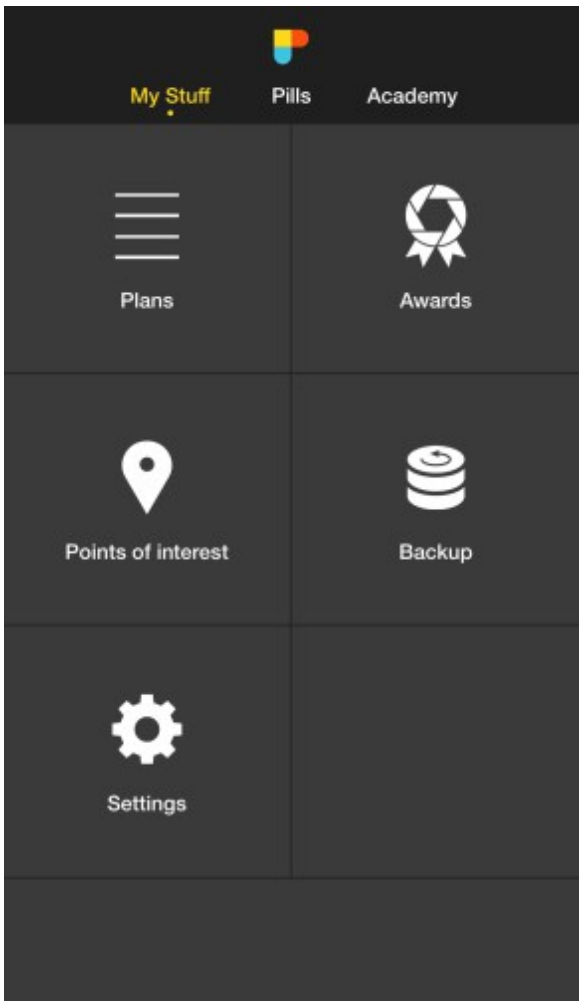
In addition, PhotoPills allows you to navigate throughout the map, find interesting locations and create **your own Points of Interest (POI) database**.

How?

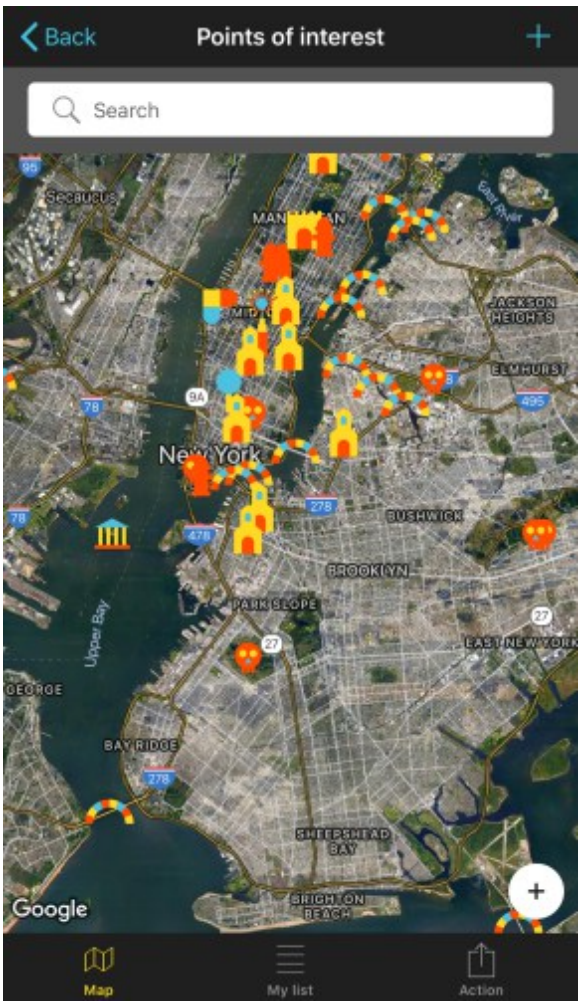
It's very (very) easy!

Imagine that you've discovered a location, a Point of Interest (POI), that you love. For example, the Fire Island lighthouse in Long Island (USA).

Open **PhotoPills** and tap on *My Stuff* (top menu). Then tap on **Points of Interest**.



PhotoPills - My Stuff Menu. Tap on Points of Interest.



PhotoPills - Main screen of the Points of Interest tool.

Once there, the map will open. You have two options.

One, navigate throughout the map by zooming in and out until you find the exact spot where you want to establish the POI. Once you have it, tap on the "+" symbol at the top right corner.

On the new screen, place the **Red Pin** on the location you want to save. Add a name to your POI and tap on *Category* to select the icon that will represent it. Once you have done so, tap on the **Save** button and the Point of Interest will show up on the map.

PhotoPills - Add Point of Interest Screen. Place the Red Pin on the point you want to save. Type a name and choose a category for your Point of Interest. Tap on Save.

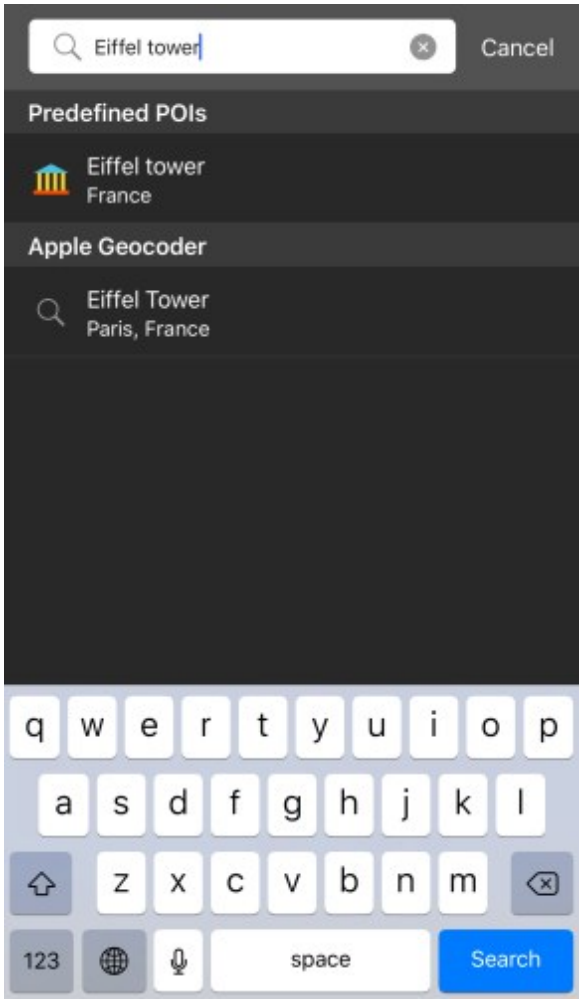
PhotoPills - View of the Point of Interest on the map.

You can check the POIs you've already saved by clicking on *My list* at the bottom of the main screen of the *Points of Interest* tool (remember that it's in the *My Stuff* top menu).

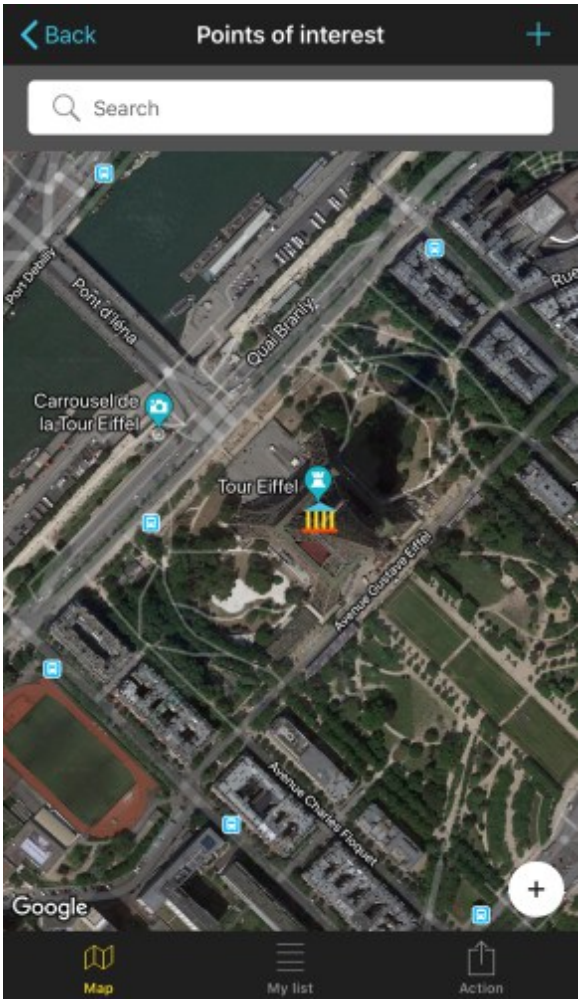
Two, use the search box to find the location. It's on the map (you'll easily recognize it because it has a magnifying glass inside).

Type the name of the location or town. Tap on *Find* and the map will move to that exact location. You can also select one of the predefined POIs or the options the search engine provides you.

If you want to save the location, you have to follow the same steps I explained in the first option.



PhotoPills - Type the name of the location in the search box, tap on Search and select one of the results



PhotoPills - When you select one of the results, the map will focus on that location.

In addition to this, when you save your locations, you can also add photos and notes to describe them. And don't forget to **share your locations with other PhotoPillers** using the *Action* button!

You can also save locations with the **Planner** by tapping on the **Save** button that you can find at the bottom of the screen.

Finally, and always in the Planner, if you tap on the **Load** button and then on *Point of Interest*, you'll see the list of your saved locations. Select the one you want and the **Red Pin** will be placed in that location.

That's how you can start planning a photo!

But that's something I'll explain to you step by step later on in **section 8**.

Google Earth

Once you're familiar with it, you'll understand that Google Earth is a very powerful tool. Its main advantage is that it allows you to explore potential photographic locations anywhere in the world with its 3D view.

Best of all, you can do it at home... from your own couch!

All you have to do is place yourself virtually anywhere on Earth. Once there, you can analyze in detail the location and its surroundings from a topographic point of view.

With Google Earth you can study a specific area at bird's eye view, and you also have a ground level view. You can also use 2D and 3D orbital views.

As you explore the location, try changing your point of view, moving your position as well as zooming in and out. This helps you determine possible shooting spots, work different compositions in the same place, and of course find your way to get there!

You can download Google Earth on your smartphone, tablet, laptop and desktop.

Google Earth is available on **iOS** and **Android**.

Your legs!

The traditional system never fails XD

Sometimes I like to choose an area on the map and just scout it. I love to walk around the location looking for photos, but without carrying all the gear on my back.

You can't imagine how much I enjoy spending time at the location, looking for subjects, compositions, framing... In short, spending hours imagining, visualizing and exploring potential photographic opportunities on the ground is key to my photography.

It helps me a lot to create, plan and prepare the shot.

I challenge you to do the same!

In short, these are the tools I use. I hope you find them as useful as I do.

And if you have any other sources of inspiration that you consider key, share them with me and the rest of PhotoPillers by leaving a comment at the end of this guide :)

In photography sharing always makes things funnier!

Next step: planning the shot

Great!

You're almost there...

So far you've decided your location. If you haven't, hurry, pick one because we're going to plan a photo.

You're not far away from capturing the photo of your dreams.

Let's get to work!

Section 6:

How to plan your photo ideas with filters like a pro

Planning a photograph is like cooking a delicious meal.

It's prepared with top quality products, with lots of love and patience.

You start by mixing the main ingredients to build the base of the dish (location, subject and composition).

Then, you add top quality products to add flavor to the meal (the quality of light and its direction, the Sun in the frame...).

Finally, you give the dish a little extra punch with the right finishing touch (weather conditions, wind direction, tides, etc.).

But, get out please. Get out of the kitchen and go back to photography.

The goal of planning in photography is to get:

- A shooting spot, from where to take the picture,
- A shooting direction (framing) and
- A date and time of shooting...

That help you to capture the photo you have in mind.

It's an iterative process during which you're producing (planning) the photo.

It may seem like a lot of work, but you've nothing to worry about. **PhotoPills** can make your planning job a breeze.

Let's go to the point...

That's how I plan the photo ideas I shoot with filters.

Producing the picture...

Nikon D4s | 14mm | f/16 | 25s | ISO 100 | 6500K | ND 1.8 (6 stops), soft GND 0.9 (3 stops) and polarizer filters

Considering a specific location and subject (**section 5**), the shooting spot, the shooting direction (the frame) and the date and time of shooting will depend on the rest of the ingredients you want to add to the photo, and their priority.

By "ingredients", I mean:

- Basic composition elements (**section 5**): lines, triangles, contrast, balance, textures, symmetry, patterns, proportions...
- The type of **natural light**: day, **golden hour**, **blue hour**, twilight and night.
- The light direction.
- The **Sun**, the **Moon**, **solar eclipses** and **lunar eclipses**, the **Milky Way**, **Star Trails**, **Meteor Showers** as composition elements in the frame.

- Weather conditions.
- The wind direction.
- Tides.

So once you have the location and subject, your job is to decide the next ingredient you want to add to the photo (the next most important one) and adjust the shooting spot, the frame and the date and time of shooting accordingly.

Let's use as an example the photograph that illustrates this section. My intention in the photo is to show the relationship between the main subject (the Favàritx lighthouse in Menorca) and the water-filled triangle in the foreground.

This relationship marks the shooting spot, the framing, but also the date of the photo, as I need the triangle to be full of water... So I have to wait for a strong wave or heavy rain to fill it. We don't have tides in Menorca ;)

Then, I tweak the picture adding more ingredients. For example, a certain type of light and its direction (time of day) or wind and cloud conditions.

Planning the light (type and direction)

Nikon D4s | 19mm | f/5.6 | 1s | ISO 100 | 7500K | ND 1.8 (6 stops), soft GND 0.9 (3 stops) and 165mm polarizer (slided upside down to enhance colors) filters

Obviously, you can shoot with filters during the central hours of the day (harsh light). But my favorite moments of the day are the **golden hour** (orange and gold tones) and the **blue hour** (blue tones).

Remember the wise words of **Galen Rowell**:

"When the magic hour arrives, my thoughts center on light rather than on the landscape. I search for perfect light, then hunt for something earthbound to match with it."

To learn more about the types of light, their relationship to the Sun elevation and the type of pictures you can take with each one of them, take a look at the guide **'Understanding the golden hour, blue hour and twilight'**.

It's an essential, must-read guide for every PhotoPiller.

"Great Toni, and how do I figure out when each type of light is happening?"

Well, it's obvious, isn't it?

With **PhotoPills**!

The **golden hour** and the **blue hour** occur at dawn and dusk... But **PhotoPills** tells you the exact times for any location in the world and for any date.

So you can quickly find out the information you need whether you're on the field or at home, sitting comfortably on the couch :P

In fact, depending on the situation you're in, **PhotoPills** offers you up to 3 different possibilities to quickly find all the information about light: the Widgets, the Sun Pill or the Planner.

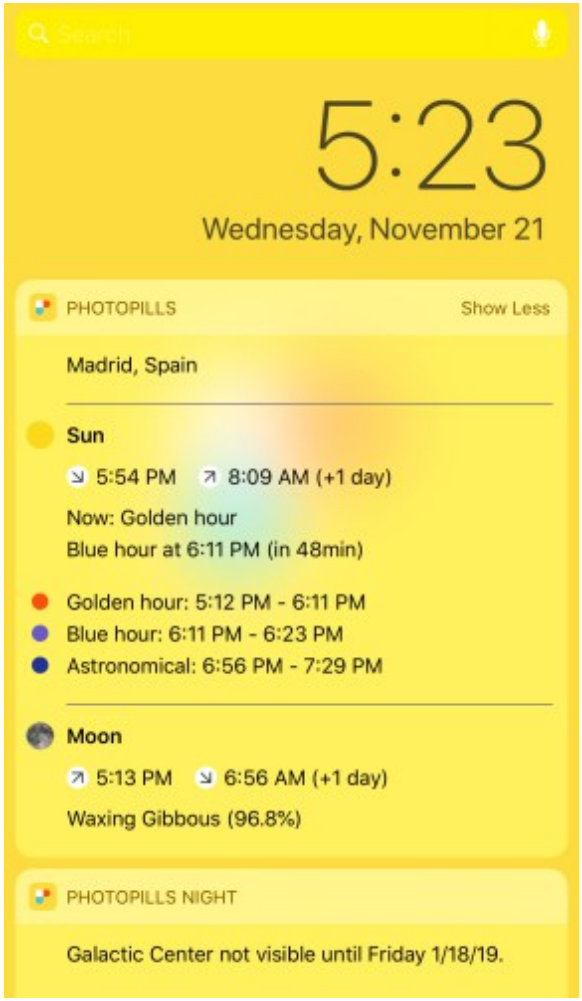
The Widgets

This is the first piece of advice I give to a PhotoPiller. The first thing you should do when downloading PhotoPills is to enable the Widgets.

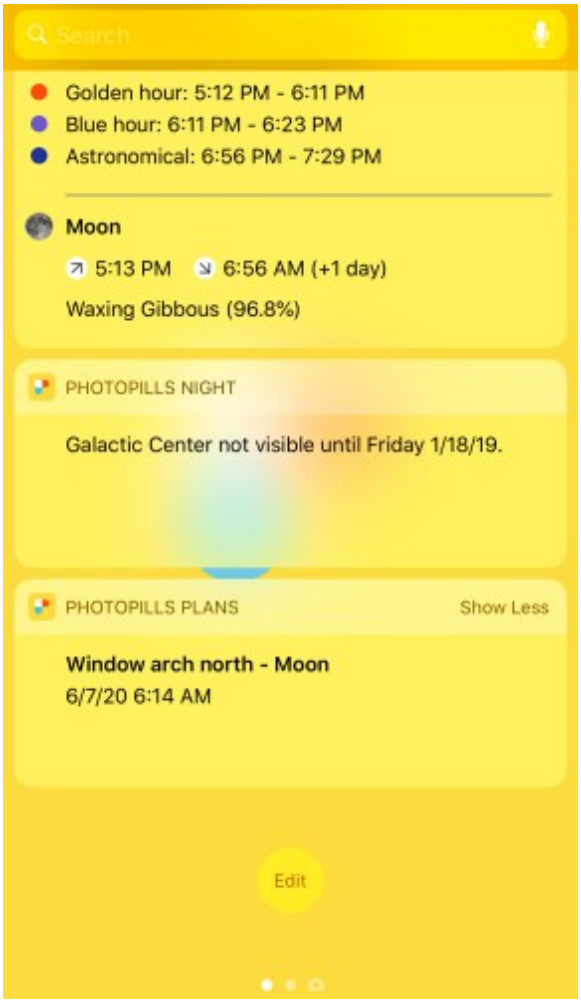
Widgets are a shortcut to key information.

Thanks to them you can quickly find out at a glance all the information you need about light (golden hour and blue hour), the Sun, the Moon and the Milky Way for the date you're in and the location you're in (even if you're offline).

I use them all the time... Enable them!



PhotoPills Widgets - Information about the Sun, Light and Moon on November 21, 2018 in Madrid, Spain.



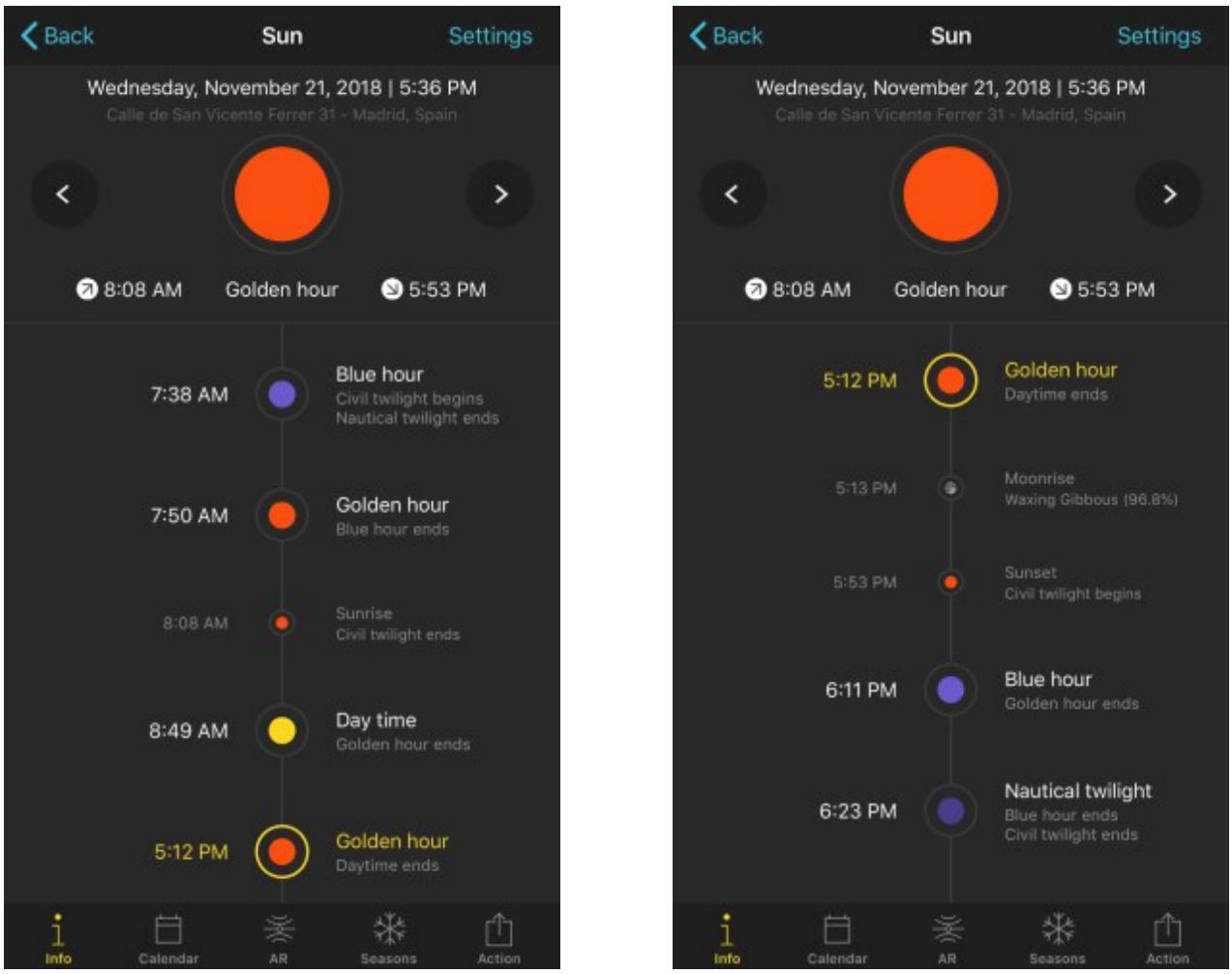
PhotoPills Widgets - Information about the Milky Way and your next planned photos.

The Sun Pill

I use the **Sun Pill** when I want to find out the key information about **natural light** (**golden hour**, **blue hour**, twilights), the Sun, the **Moon** and the **Milky Way**, considering the location where I am or where I've placed the Red Pin and according to the current date or a close date in the future.

I also use the Augmented Reality (RA) button at the bottom of the screen. With this button I can see in the field the position and direction of the Sun. It's perfect for predicting the direction of light at all times.

If you want, **you can also learn to master the Sun Pill**.

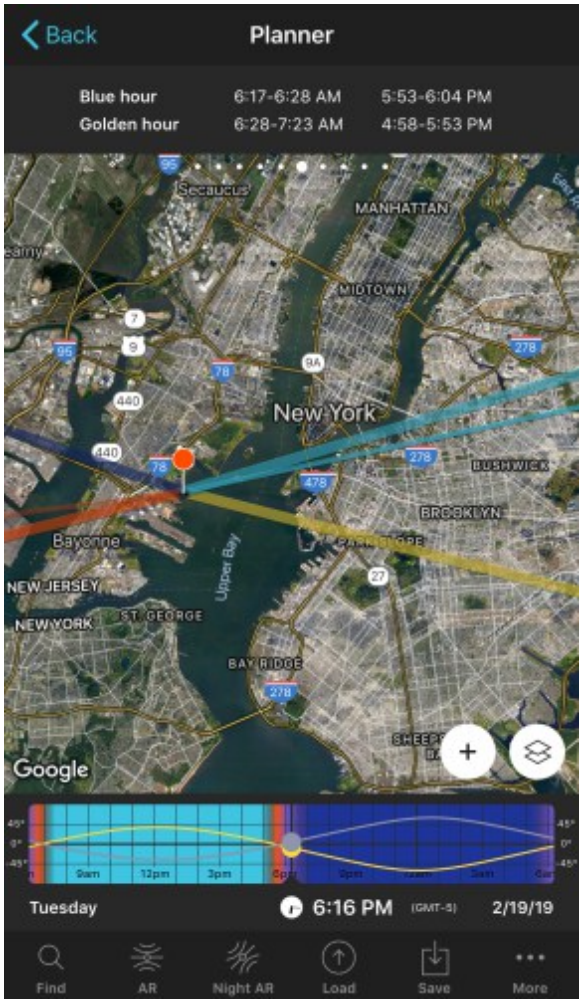


PhotoPills Sun - Information screen about Sunrise and Sunset, golden hour, blue hour, Moonrise and Sunset and Moon phase.

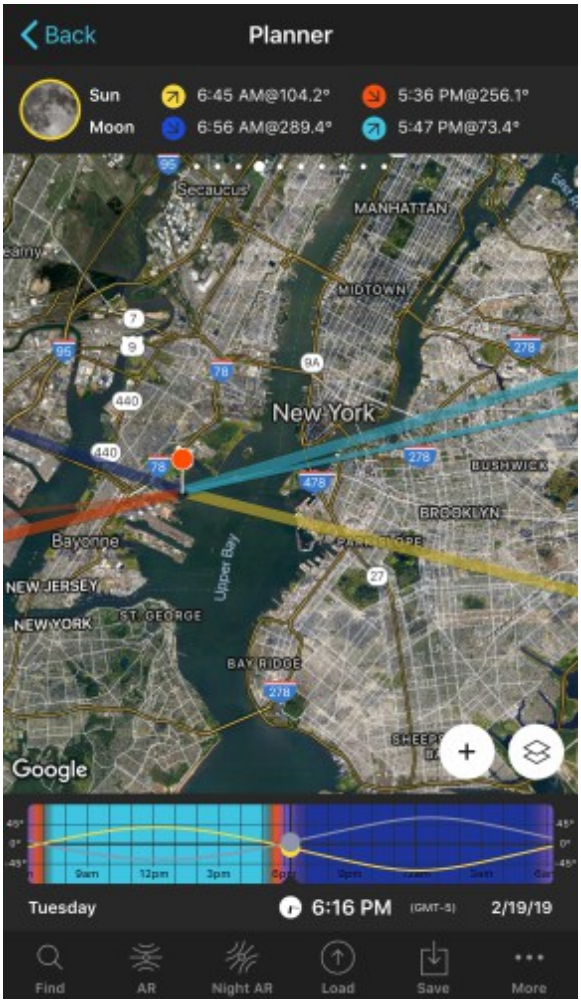
The Planner

The Planner is the most powerful pill in the PhotoPills universe.

Use it to plan any photo for any date and place in the world... from home!



PhotoPills Planner - Information about the golden hour and blue hour on the top panel. On the map, the thin blue line tells you the position of the Moon for the selected date and time. And the thin orange line tells you the position of the Sun for the selected date and time.



PhotoPills Planner - Information about the Sun and Moon rise and set times on the top panel. The thick lines are the directions of Sunrise (yellow), Sunset (orange), Moonrise (light blue) and Moonset (dark blue).

Simply:

- Place the Red Pin you see on the map in the location you want to study. **Learn how to move the Red Pin**.
- Select the desired date. **Learn how to change it with the Time Bar**.
- Visualize on the map the information of the **light**, the **Sun**, the **Moon**, the **Milky Way**, the **Shadows** and the **Eclipses**.
- Visualize in the upper panels the information of the golden hour and blue hour (**Panel 6**), the twilights (**Panel 5**), Sunrises and Sunsets (**Panel 4**), the Sun/Moon position (**Panel 3**), phase of the Moon (**Panel 3** and **Panel 4**), Galactic Center visibility (**Panel**

7), Galactic Center position and Milky Way inclination (**Panel 8**), the Shadows (**Panel 1**) and the Eclipses (**Panel 9** and **Panel 10**).

As you can see from the screenshots, the Planner not only gives you information about the golden hour and the blue hour, it also shows you the position of the Sun on the map...

That way, on the one hand, you know the direction of light at all times. On the other hand, as we'll see in the next section, you can adjust your shooting spot and framing to use the Sun in your composition.

In short, learning to use the Planner offers you a new world of creative options.

Learn how to use it!

Imagine. Plan. Shoot.!

To master the Planner I recommend you to start with this **'Introduction to planning'**.

The Sun in the frame (when you know the shooting date)

Nikon D4s | 14mm | f/8 | 34s | ISO 100 | 6500K | ND 3.0 (10 stops) and soft reverse GND 0.6 (2 stops) filters

Imagine that next Saturday you want to go and photograph the **Sunrise** at the Favàritx lighthouse in the island of Menorca. And you want a rising Sun in the picture.

How can you find out the shooting spot and the time of shooting?

Very easy...

Open the **PhotoPills** Planner and follow the steps below:

- Place the Red Pin near the Favàritx lighthouse. You can search for an address using the **Load** button. If you don't know how, I suggest you **learn how to move the Red Pin**.
- Select the date of the photo with the Time bar. **Do you want to learn how to change time with the Time Bar?**
- On the Map, the thick yellow line indicates the Sunrise direction. And if you go to **Panel 4**, you'll see the time of the Sunrise.
- Using the Sunrise line as a reference, you can move the Red Pin to a position where the Sun rises near the lighthouse and is inside the frame. Look at the first screenshot below.
- Now slide the Time Bar until you move the time close to the Sunrise time and you'll see the position of the Sun at all times – from the time of Sunrise until several minutes later (thin yellow line). Take a look at the second screenshot below.
- Once you know how to move the Red Pin, change the time and understand the meaning of the Sunrise lines and Sun position on the map, you have everything you need to plan the shot.
- Adjust the shooting spot according to the composition you want. And check the shooting time on the Time Bar.

PhotoPills Planner - Place the Red Pin near your subject and select the date of the photo. On the map you have the Sun's position (and Sunrise direction). And in Panel 4 the Sunrise time.

PhotoPills Planner - Adjust the position of the Red Pin depending on where you want the Sun in the frame. Finally, set the time of the photo in the Time Bar.

If you want to plan a photo that includes other astronomical phenomena such as the Moon, the Milky Way, eclipses or Star Trails, you should follow a similar workflow. You'll find all the details in these articles:

- **Moon**
- **Milky Way**
- **solar eclipses**
- **lunar eclipses**
- **Star Trails**

The Sun in the frame (when you don't know the shooting date)

Nikon D700 | 100mm | f/6.7 | 1/60s | ISO 200 | 5900K | Polarizer

"Toni, and if I'm sure about the shooting spot and the frame... Is it possible to find out when the Sun will be where I want it to be in the frame?"

Of course!

Use the **Find** button on the Planner.

I think it's best if I explain it to you with an example, planning the shot that illustrates this section. It's a **puesta de Sol** under a natural bridge on the island of Menorca called Es Pont d'En Gil.

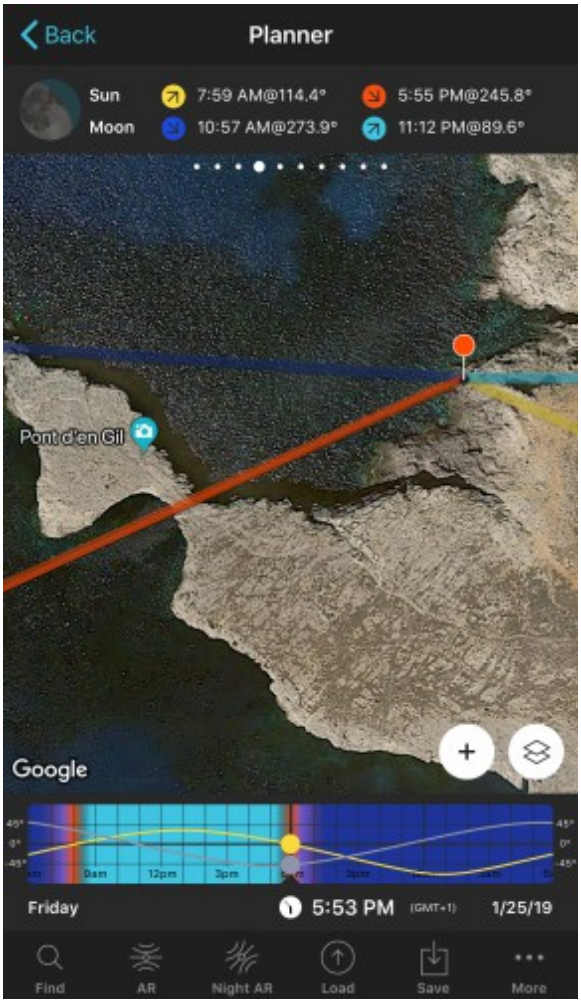
You have the step by step explanation in the **'How to find Sunrises and Sunsets'** guide.

But if you prefer something shorter, I'll give you a summary of the workflow you should follow.

Open **PhotoPills**, tap on Planner and follow the steps below:

- Place the **Red Pin** in the shooting spot. In this example, I've placed the Red Pin in one of the few spots from which you can see the horizon through the natural arch. Look at the first screenshot below.
- Press the **Find** button. It's the first button at the bottom of the screen.
- Press the option *Sun at azimuth & elevation* (iOS) or simply *Sun* (Android). This option allows you to set a range of dates as a starting point, and the desired Sun position (depending on its **azimuth and elevation**).
- Enter the date range.
- Enter the direction of the Sun (the azimuth) by placing the Yellow Pin over the natural arch in this example.
- Enter the elevation of the Sun. In this case it will be zero as it's a Sunset.
- Tap on the *Search* button (magnifying glass in the upper right corner) to see the results table with all the dates on which the Sun sets under the bridge.
- Select the date that suits you best, **save the plan** and when the shooting day comes enjoy the moment and capture it with your camera!

PhotoPills Planner - After tapping on Search > Sun at azimuth & elevation button, enter the date range and the position of the Sun (azimuth and elevation). Tap on the Search button to see the dates on which the photo happens.



PhotoPills Planner - When you select a date from the results table, you'll see the plan on the Planner. It's time to adjust what's necessary and save the plan.

The workflow for planning the Moon is exactly the same as we explain in the **'How to find Moonrises and Moonsets'** guide.

As for the Milky Way and Star Trails, you'll have to follow a different workflow.

You can find the explanation in these videos:

- **How To Find And Plan The Milky Way**.
- **How To Plan Star Trails**.

Predict the tides

Nikon D4s | 25mm | f/5.6 | 2s | ISO 100 | 6500K | Soft GND 0.9 (3 stops) and polarizer filters

If you're planning a photo in a tidal zone... Don't forget to check the high and low tide hours!

There are countless websites and applications for it, but my favorite is **tides4fishing**.

As a safety precaution

Don't take it as a joke. Capturing long exposures with filters on the coastline can be dangerous.

As you move around and take pictures on the seashore, you'll surely be surrounded by stones and rocks. And if they're wet or damp, they can be very slippery.

In addition to this, don't forget to take the tides into account and how they affect on the

strength of the waves.

That's why it's essential to scout the location in advance and (bingo!) know when the tides will happen on the shooting day. Depending on where you are, the difference between low tide and high tide can be considerable.

Be cautious and avoid bad surprises.

To get a better composition

In addition to safety, you should learn about the movements and height of the sea in your shooting location. Tides can cause significant changes in the surroundings.

Imagine, for example, that a group of rocks you want in the frame may be covered or uncovered depending on sea level. If at the shooting time the rocks are under the water... you've screwed up your shooting session!

Another example. The reflections you get when the tide is going down and leaves a very thin layer of water on the sand. If you add a nice light to that ingredient, such as the light during **golden hour**, you can get amazing results.

So it's crucial that you take tides into account when choosing your location and determining the shooting time in your planning.

Prepare your gear

Water is one of the main enemies of your photography gear.

Be cautious and:

- Determine if your tripod can get wet or not. Chances are you'll have to put it somewhere where its legs will get wet. And if it risks rusting or breaking...
- Take several microfiber cloths with you. When you put the filters in front of the lens, that surface is a magnet for water droplets. If you don't clean them regularly, your photos will have lots stains and dirt.
- Wear water boots or appropriate footwear. Make sure that the sole doesn't make you slip when you're walking over rocks full of moisture or moss. And make sure you keep your feet dry :)

One more thing.

When you're back at home, don't forget to rinse your gear in fresh, warm water, especially the tripod. Salt can be devastating in the medium term if you're not careful enough.

Don't forget to check the weather forecast (clouds and wind)

Nikon D4s | 14mm | f/16 | 120s | ISO 100 | 7500K | ND 1.8 (6 stops) and soft GND 1.2 (4 stops) filters

Only a few days left until the big moment... The shooting time.

You feel that you have everything under control. That nothing can fail.

Are you sure?

Think about it... :P

That's right, no one can control the weather... That's why we PhotoPillers like to say "*Plan and Pray*". We even designed a t-shirt with the **Plan & Pray** motto!

Whenever you're planning to take photos outdoors, it's important to take into account the weather forecast.

By doing this, you can anticipate what you'll find in the location. And also check if the conditions you're looking for are there.

Sometimes you're lucky enough to have the clouds you want and the wind direction you need to reinforce the composition.

Checking the forecast, especially regarding clouds and wind direction (and strength) is key!

My weather apps

Whenever possible, I like to check first the location's national meteorology service. It usually provides the most accurate and reliable information.

But when meteorology comes into play, I'd rather be cautious and check several sources of information in order to have the most reliable data.

So here you have the two sources that I use to contrast the information the location's national meteorology service provides.

Windy

Windy is my favorite application when I want to know what kind of weather I'm going to find at the shooting location. I find it very useful because I can check a lot of information and it has a very nice interface.

The application tells you, for a specific location, the following data: wind (direction and speed), rain, snow, temperatures, clouds (at different altitudes) and waves (direction, strength and water temperature).

The bar at the bottom of the screen also offers a lot of information. It gives you, for example, a 7-day forecast of all these elements and you can choose to see them in different formats (basic, meteogram and aerogram). Also, I love the option to see satellite images.

With Windy you can create your own custom maps including the data and colors you prefer. And, of course, you can see how the forecast changes over several days.

You can download the Windy application on your smartphone and tablet. You can also go to the website on your laptop and desktop computer.

Windy is available on **iOS** and **Android**.

Ventusky

As I said before, when it comes to checking weather forecasts, I like to be conservative and check multiple sources.

And my second favorite option is Ventusky, an app that uses multiple maps to give you tons of weather information.

By default, the main interface is a map of your local area that allows you to see, at a glance, what the weather is like in your location. Thanks to a color code you can see the temperature and the wind direction lines that move over the earth. Of course, you can change the units in the configuration settings.

To see the weather nationwide, zoom out the map. To see it internationally, zoom out even further.

You can also see an animated weather forecast on the screen. Tap the *Play* button (lower left corner) and you'll see the weather evolution in the next hours or days. You can see a 7-day forecast or go back in time.

You can download the Ventusky application on your smartphone and on your tablet. But you can also use it through the website on your laptop and desktop computer.

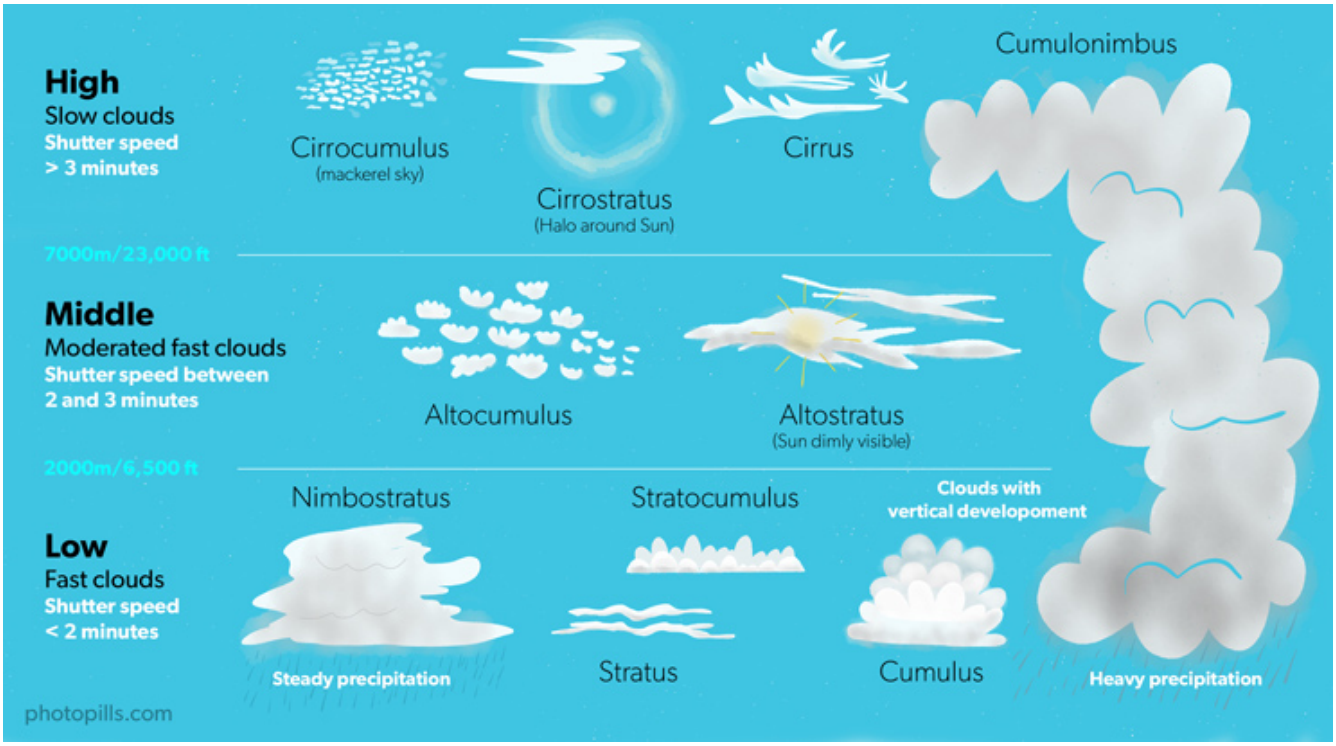
Ventusky is available on **iOS** and **Android**.

Study the clouds (and the wind)

From a composition point of view, clouds, along with wind direction and speed, are an essential element. Their presence, color and the direction (and speed) in which they move will make your image more or less dramatic.

So if weather forecasts indicate that on the shooting time there will be clouds in your scene, you should study them. That's how you'll be able to anticipate their behaviour and get the most out of them when you're doing your long exposure.

How fast are they going to move?



Don't panic because this isn't an "Advanced Meteorology" course... XD

I just want to draw your attention to some features so that you become familiar with the different types of clouds you may encounter.

Since we're talking about long exposures, and as long as there is wind in the location, the clouds will be one of the main elements that will help you convey motion.

But how much motion?

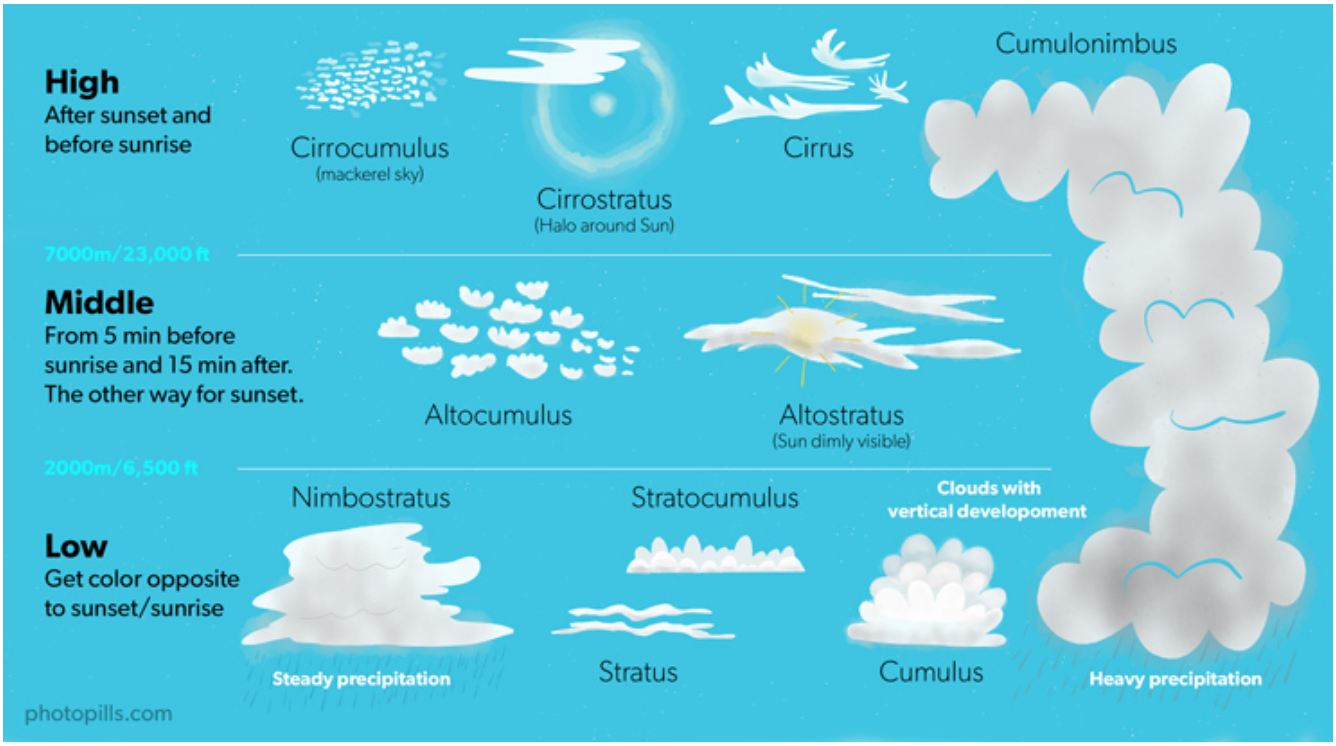
In other words, how fast do those clouds move? And what shutter speed do you need during the shooting?

We can divide the types of clouds into 3 groups. Each of them moves at a different speed:

- **High clouds**. They move very slowly. Use shutter speeds of **3 minutes or more**.
- **Middle clouds**. Their speed is moderately fast. I recommend using shutter speeds **between 2 and 3 minutes**.
- **Low clouds**. They move very fast. Use shutter speeds of **2 minutes or less**.

Obviously these are just estimates as everything will depend on how strong the wind blows.

What color can they have?



Clouds convey other emotions on a long exposure picture. They can also leave the spectator speechless depending on the color they have.

That's why it's important to know when the sunlight is going to color them.

Again, we can divide the types of clouds into 3 groups. Each of them is colored at a different time of Sunrise or Sunset:

- **High clouds**. They are colored **before** Sunrise or **after** Sunset.
- **Middle clouds**. They can get color between 5 minutes before Sunrise and 15 minutes after Sunrise. Conversely, they can get color 15 minutes before Sunset and 5 minutes after.
- **Low clouds**. They are colored during Sunrise and Sunset. But only those that are in the **opposite** direction to the Sun.

Are you still here? Yeah?

That's great!

Now you know how to find a dream location and plan a spectacular photo.

It's time to prepare the equipment you're going to use :)

Section 7:

All the photography equipment you need (apart from filters)

Camera

You can use filters on any camera to take pictures. Although, obviously, depending on the type of camera you use, some photos will be better than others depending on your expectations and their technical limitations.

Can you use filters on your smartphone?

Unbelievable but... Yes!

Some manufacturers, such as NiSi, have specific filters for mobiles. In addition to this, you'll need a shooting application that allows you to shoot in manual (M) or using a semi-automatic mode (A/Av or S/Tv).

Also keep in mind that you're going to shoot at relatively slow shutter speeds so you'll need

some kind of tripod or support to keep it stable. Otherwise, handholding your smartphone will produce blurred pictures.

Point-and-shoot cameras

In general, all point-and-shoot cameras offer an average image quality and are very good value for money.

That said, your artistic capabilities will depend on your ability to find a filter system that fits your camera. For example, **the circular filter adapter that Lensmate has for the Sony RX100 (for all versions)** or my favorite, the **MagFilter magnetic filters**.

And if not, you can always try to handhold the filters yourself or **move the filters during the exposure**.

Try and experiment because you never know. You can still get an amazing picture!

Low-end cameras

The following cameras allow full manual and semiautomatic basic exposure:

- Cameras with an **APS-C** sensor: Nikon **D3500**, **D5600**; Canon **2000D**, **4000D**, **M50**; Pentax **K-70** and Sony **a6000**.
- Camera with a **Micro 4/3** sensor: Olympus **E-PL9**; Panasonic **GX85**.
- Compact camera (1" sensor): Sony **RX100 IV**.

Mid-range cameras

In the mid-range price (and quality), I recommend you the following cameras:

- Cameras with an APS-C sensor: Nikon **Z50**, **D7200**, **D7500**; Canon **800D**, **7D Mark II**; Fuji **XT-20**; Pentax **KP** and Sony **a6600**.
- Cameras with a Micro 4/3 sensor: Olympus **OM-D E-M5 Mark II** and **OM-D E-M1 Mark II**; Panasonic **GX9**.
- Full Frame cameras: Nikon **D610**, **D750**; Sony **a7C**, **a7 II** and **a7R II**.

High-end cameras

On the higher price range (and higher quality), I recommend you these cameras:

- Cameras with an APS-C sensor: Nikon **D500**; Fuji **XH-1**, **XT-4** and **X-Pro2**.
- Cameras with a Micro 4/3 sensor: Olympus **OM-D E-M1X**.
- Full Frame cameras: Nikon **Z6**, **Z7**, **D810**, **D850**, **D4s**, **Df**, **D5**; Canon **R**, **6D**, **6D Mark II**, **5D Mark IV**, **5DS**, **5DS R**, **1D X Mark II**; Panasonic **S1R** and **S1H**; Pentax **K-1 Mark II**; Sony **a7 III**, **a7S III**, **a7R III**, **a7R IV** and **a9**.

Lens

Your choice of lens and focal length will depend on which part of the scene you want to capture in your photos.

If you want to include a large part of the landscape, use a wide angle. For example, the **Nikon 14-24mm f/2.8** (it's my favorite!).

If you prefer to focus on a smaller area or even more specific details, bring a standard telephoto lens. For example, the **Nikon 24-120mm f/4** or the **Canon 24-105mm f/4**.

Filters

The filter(s) you choose will depend on the photo you've imagined (**section 1** and **section 5**) and planned (**section 6**).

As I explained in **section 2**, each filter has a very specific use. So everything is up to you.

What do you want to capture?

Would you like to enhance a reflection? Use a polarizer.

Do you want water to have a silk effect? Use a neutral density filter (ND).

Here you have again the table in **section 2** where I summarize the use each filter has and what you can capture with them.

Filter	What is it for?

continues on next page

Table 1 – continued from previous page

Ultaviolet (UV)	Blocks ultraviolet rays.
Skylight	In film cameras, it offsets the bluish cast that some scenes can have.
Polarizer	Eliminates non-metallic reflections. Eliminates or enhances fog and rainbows. Increases saturation and contrast.
Gold-N-Blue Polarizer	Adds variable gold or blue tones to reflections depending on the orientation of the filter.
Varicolor Blue/Yellow Polarizer	Adds variable gold or blue tones to reflections depending on the orientation of the filter.
Neutral density (ND)	Reduces evenly the light that reaches the sensor. Increases the exposure time.
Graduated neutral density (GND)	Gradually reduces the light that reaches the sensor with greater intensity on one of the edges of the filter. Successfully captures scenes with a high dynamic range.
Reverse graduated neutral density	Gradually reduces the light that reaches the sensor with greater intensity from the center of the filter. Successfully captures a high dynamic range scenes.
Black card	Prevents light from reaching the sensor.
Infrared	Allows only infrared light to reach the sensor.
Light pollution reduction	Prevents sodium vapor bulbs from changing the color temperature of the night scene.
Solar	Allows to photograph directly the Sun or a solar eclipse preventing the sensor from capturing infrared (IR) and ultraviolet (UV) rays.

Filter holder

Remember there are two types of filters?

That's right, circular screw-on and square or rectangular filters.

Well, you have two ways of working with square or rectangular filters:

- **Handhold them in front of the lens**.
- Using a filter holder.

A filter holder is exactly that — a holder. It's usually made of plastic, and you mount it to the front of the lens using an adapter ring (more details about the latter in the next section). The filter holder has a series of slots in which you can slide different filters. The number of slots depends on the manufacturer, although a regular filter holder has usually three slots.

Obviously, the size of the filter holder you need depends on the size of the filters.

So if you have determined that you need 100mm filters for your lenses, the filter holder will have to be the same size.

I use a 100mm **Lucroit** filter holder for my Zeiss Milvus 18mm f/2.8, Nikon 17-35mm f/2.8, Sigma 35mm f/1.4, Nikon 70-200mm f/2.8, among other lenses.

I also use a 165mm Lucroit filter holder with my **Nikon 14-24mm f/2.8** lens. Remember that this system can be used on smaller diameter lenses with an adapter.

The filter holders are made by the filter brands themselves. The most popular ones are: Lucroit, Nisi, Haida, Lee, Formatt-Hitech and Benro.

Adapter rings

As I told you in the previous section, you need an adapter ring to attach the filter holder to the front of the lens.

It usually has a thread on the back that holds it to the lens. The front usually has a click system that allows you to hook the filter holder pressing it a little bit.

But the most important feature of an adapter ring is not its front or rear attachment system.

It's its size.

So the first thing you have to take into account is the diameter of your lens. If you don't, the ring thread won't fit the lens... ;)

Imagine you have two lenses: a 77mm one and a 58mm one. If you want to use your filter holder with both you need two adapter rings: a 77mm one and a 58mm one. That was an easy guess... XD

There are adaptor rings that have all the sizes you can imagine, and they're usually very cheap.

Tripod and ballhead

You definitely need a sturdy and solid tripod. In other words, a heavy tripod!

This is particularly important if you plan to shoot long exposures with filters because you have to make sure your gear doesn't move an inch during the capture.

In any case, you need to keep your camera steady in order to prevent vibrations that could blur your photos.

"Toni, I have a basic tripod. Can I use it for my long exposures with filters?"

Basic tripods don't usually weigh much and that makes them pretty unstable.

Use these simple yet useful tricks to avoid vibrations:

- Hang a bag filled with stones or even your camera bag from the hook located at the bottom of your tripod's center column. But don't do it when it's windy, you'll get the opposite effect!
- Don't raise the center column of the tripod if it has one, it will make it more unstable.

"If I had to buy a good tripod, what would you recommend?"

Get the **Manfrotto 055XPRO3**. It's probably the best seller tripod among advanced amateur photographers!

Have a look at the **Travel** line of **Benro** too.

If you want to (and can) spend a little bit more, have a look at carbon fiber tripods.

These tripods are robust and weigh less than the aluminium ones. They allow loads from 5 kg to over 25 kg (11-56 lb) depending on the model.

Brands like **Gitzo**, **Manfrotto**, **Benro**, **Induro** or **Really Right Stuff** offer tripods of great quality in both materials, carbon and aluminum.

"Great! What about the ballhead?"

Choosing your tripod head will depend on your taste, but make sure that it can bear at least 5/7 kg (11/16 lb) of weight and that it includes a removable plate.

In my opinion, the tripod's best friend is a good ballhead. The **Really Right Stuff BH-55** is the one that I use. Supporting up to 23 kg (50 lb), it bears the weight of my gear with no problem. It allows me to work comfortably and with great precision.

Other ballheads that I like are the **Gitzo GH1382QD**, the **Kirk Enterprises BH-1** and the **Arca Swiss Monoball Z1 SP**, all robust and with very high endurance (minimum 13.5 kg or 30 lb).

Additionally, if you're using a super telephoto lens you may want to use a gimbal head, such as the one I use, the **Benro GH2**.

Intervalometer

While shooting with filters, especially during long exposures, you should avoid vibrations. Otherwise, you risk ending up with a whole bunch of blurred photos. In order to do so, you need a way to trigger your camera without having to touch it.

Shutter releases and intervalometers will do the job. But, in my opinion, you should forget about the remote shutter release and get a good intervalometer.

Why?

Because remote releases are not programmable. You cannot shoot at regular intervals automatically.

The intervalometer is programmable. You can set the exposure time, the time interval between each shot, the total number of photos you want to take and even the time delay of the first picture.

These are all great intervalometers:

- Brand intervalometers: **Canon TC-80N3** or **Phottix TR90**.
- For cheap intervalometers check the brand **Yongnuo**.

A great alternative is a device called **CamRanger**. Right now it's available for Nikon, Canon, Fuji and Sony cameras.

It's a stand-alone device that you connect to your DSLR or mirrorless camera with a USB cable. It creates an ad hoc WiFi network to which you can connect your smartphone or tablet

(iOS, Android and Windows). Thanks to the CamRanger application you can control your camera without a computer or an Internet connection.

Best of all, this device is independent. Therefore, if your mobile device loses its connection, the CamRanger has an internal memory to keep shooting. Imagine that you are making a timelapse, your sequence would be cut if the camera stops taking pictures in the time frame you've set...

So the CamRanger is great for many types of photos: timelapses (of the **Milky Way**, of **Star Trails**, of **solar eclipses** or **lunar eclipses**...), **bracketing**, focus stacking for macro and landscapes... and many more!

Memory cards

There are many different types of **SD Cards** (Secure Digital) depending on capacity and data transfer speed. There are many brands on the market but my favorites are **SanDisk** and **ProGrade**.

For beginners, 32GB SD cards class 10 or U1 (from $15) are enough. They are great, cheap and the amount of photos stored is fine.

But... Its main drawback is that the transfer speed (how fast data is written to the card) is not the best in the world.

Buy a memory card with a high transfer rate, because it allows each picture to be saved into the memory card quicker.

Nowadays, the price of SD cards has dropped so much and it's so cheap to purchase an SDHC speed class 10 16GB card that you shouldn't purchase anything with less specifications.

Finally, I recommend you to use several small capacity cards rather than a few large capacity ones. That way, if you lose a card or spoil it, fewer pictures will be lost. By using several small capacity cards you decrease the risk of losing your photos.

While there are still cameras that can work with **CompactFlash** (CF) cards, this system is slowly disappearing.

And to replace it, SanDisk, Nikon and Sony launched a new card format called **XQD** available for several Full Frame (D4, D4s, D5 and D850), APS-C (D500) and mirrorless (Z6 and Z7) models. These cards

- Have a very high storage capacity (from 32GB to 256GB).

- Have a super fast reading and recording speed (400MB/s compared to 160MB/s for a CF card or 250MB/s for an SD card).
- Are very secure, resistant and with an incredible durability.

Their only problem: a high price (for now).

Microfiber cloth

I suggest you always carry several microfiber cloths in your backpack. Microfiber is the perfect fabric to clean both the front glass of your lens and your filters. It doesn't damage, stain or leave residue on any glass surface.

You can easily leave handprints or grease while manipulating the filters. And if you're doing a photo shooting on the coast, the sea may splash and leave drops on the filter. Or it could rain...

Anyway, the chances of getting stains on your filter are very high. They are dirt magnets.

And if you don't clean it, that dirt will show up in your images.

So if you don't want to spend hours in front of your computer cloning black spots, always carry several microfiber cloths with you!

Before I finish, let me give you some basic tips on cleaning your filters:

- Don't clean a filter with any fabric other than microfiber. You could scratch it.
- If the filter gets stained with salt water, don't forget to rinse it when you get home. Rinse it under fresh, warm water and dry it well with the microfiber cloth.
- When washing your cloth don't use bleach (it ruins the fabric). Avoid washing them with cotton towels (the microfiber collects all the particles) and don't use fabric softener because it will eliminate the static electricity that the microfiber needs to work properly.

And now that we've seen in detail all the key pieces of gear that you can or, rather, you should include into your equipment, there's no time to waste.

It's time to learn how to use and expose with the different types of filters :)

Section 8:

How to use the polarizing filter (and expose with it)

Nikon D4s | 18mm | f/11 | 0.8s | ISO 100 | 7000K | Soft GND 1.2 (4 stops) and polarizer filters

What is a polarizing filter

Although I told you a few things about the polarizer in **section 2**, now I would like to explain you in more detail how to use it.

You surely remember that in photography we use a circular polarizing filter (CPL).

To use it, all you have to do is rotate it and you'll see how part of the scene becomes "polarized". And if you rotate it in the opposite direction, it "depolarizes".

And I write "part" because it's a filter that partially acts on the scene. When you use it you have to decide which part of the scene you want to polarize.

Basically, a polarizer helps you:

- Eliminate most of the light reflected in your scene. Therefore, the saturation and contrast of your photo increases.
- Reduce haze.
- Make reflections disappear (as long as they are non-metallic). Or enhance them.

How much light the polarizer subtracts

Like any other filter, the polarizer is a filter that subtracts some of the light that enters through the lens to the sensor.

How much light?

It depends on the manufacturer and the model, but it usually subtracts is between 1.5 and 2 **stops**.

When the filter is polarizing at its maximum, it's subtracting the maximum number of stops. It actually subtracts light in the whole scene, although it does it more vividly in the areas where the reflections are eliminated (as long as they are non-metallic).

But if you haven't rotated it to its maximum, and you've left it at an intermediate point of polarization, the filter will be subtracting a little less light.

You can see its effect with the naked eye.

Take your circular polarizer and stand in front of a light source. Look through the polarizer. Now, rotate the ring very gently with the other hand. See how it gets darker?

Because it's so gradual, it's hard to tell exactly how many stops it subtracts. At the same time, this allows you to make very precise adjustments and polarize a lot, a bit, or just a tiny little bit (as much as you want!).

How to use the polarizer

Let's see step by step the workflow you have to follow to use the polarizer.

1. Mount the polarizer in front of the lens

Depending on the system you use and the shape of the polarizer (circular or rectangular), the mounting system will be different:

- If it's a circular polarizer that matches the lens diameter, screw it on carefully and try not to leave fingerprints on the surface.
- If it's a circular polarizer that doesn't match the lens diameter, screw it into the corresponding ring of the filter holder. Be careful not to leave fingerprints on the surface. Then, put the ring in the filter holder. Depending on the brand you're using, the polarizer may be closer or further away from the sensor.
- If it's a rectangular polarizer, insert it into the corresponding slot on the filter holder. This is usually a slot, other than those enabled for ND and GND filters, or a specific holder.

2. Turn the filter carefully until you get the desired effect

If you have a mirrorless camera (with an electronic viewfinder) or a DSLR with this option, turn on the live histogram.

The key to using the polarizer is the angle.

In other words, how much you have to rotate it to get what you want.

Fortunately, the procedure is very simple and much more intuitive than you imagine.

Once you're happy with your composition, all you have to do is rotate the filter gently. Do it little by little.

In the meantime, check the LCD screen with Live View, or your electronic viewfinder if you have a mirrorless camera, to see if you're getting the effect you want. And if so, if the filter is doing it with the intensity you're looking for.

Imagine, for example, that you're photographing a **seascape** and you want to see the detail of the seabed in the area closest to the shore (foreground). Rotate the polarizer slowly. If you see the water becoming more and more opaque, rotate it in the opposite direction and you'll see how the rocks and sand of the bottom magically appear.

Now suppose you want to add contrast to the sky and highlight the volume of the clouds. In this case, the best moment is when the Sun forms a 90° angle with respect to the direction you're pointing your camera to.

So you need to have the Sun either to your left or to your right. That's how you get the maximum possible polarization of the sky.

3. Meter the light to adjust the exposure and focus

Well, now that you've determined how, where and how much the polarizer affects the scene, it's time to **meter the light in the key tone of the scene** (with the polarizer on).

Remember that, depending on the polarization angle, the filter subtracts between 1.5 and 2 stops. So you'll have to **adjust the exposure according to what you want to achieve**.

If you have a mirrorless camera (with an electronic viewfinder) or a DSLR with this option, use the live histogram to help you adjust the exposure precisely.

Finally, focus. If you use the autofocus (and you're not using the back button focus), don't forget to change it to manual once you're done to avoid refocusing by mistake by pressing the shutter button...

4. Take the shot and check the result

If you didn't get the polarization effect you were looking for, carefully rotate the filter ring (or the filter itself, if it is rectangular) back until you do.

If the photo doesn't have the exposure you were looking for, adjust one of the **exposure triangle** settings.

Before I finish, let me remind you a couple of things.

First, you should avoid using a polarizing filter if you're going to use a wide angle lens and/or if you're going to take a panoramic photo. Keep in mind that you'll be covering an extremely wide angle angle of the scene and the polarizer won't be able to cover it completely. You'll have halos or flares in the picture.

Second, no matter how powerful **Lightroom** and **Photoshop** are, they'll never manage to emulate the effect of a polarizing filter.

Section 9:

How to expose using one or several ND filters

In **section 3** I explained you in detail how you can use the **PhotoPills long exposure calculator** to calibrate your ND filter. That is, finding out the actual density of the filter.

Now let's see how to expose a photo when you use one or more ND filters.

But first, a brief reminder...

What is an ND filter

Although you have all the details in **section 2**, let me quickly tell you about its main features.

A ND filter is a piece of glass or semi-transparent resin that you place in front of the lens.

The ND filter allows you to subtract the light that reaches the sensor evenly. By reducing the light, you can:

- Increase the exposure time.
- Use a very large aperture (small f-number).

This helps you capture certain effects without overexposing the scene.

In turn, the effect achieved depends on the number of **stops** the filter you're using is able to subtract (1, 2, 3 stops...).

A neutral density filter doesn't alter the contrast or sharpness of your image because it subtracts the light evenly.

Nor does it introduce any color cast. Or it shouldn't because, unfortunately, it's not always the case depending on the manufacturer.

If you add an ND filter in front of the lens, it's like putting a pair of sunglasses on it.

Exposing with an ND filter

You don't know where to start? Watch this video!

But if you prefer reading, here is a step by step explanation.

When using an ND filter expose by following these steps:

1. Take a test shot without the filter

Unfold your tripod and mount the camera on it. If you have a mirrorless camera (with an electronic viewfinder) or a DSLR with this option, turn on the live histogram.

Without using the filter, take a test picture of the scene you want to capture in which you get the correct **histogram**. That is, a photo that is **correctly exposed**. To do this, use the live histogram if you have it. If not, use the "try and fail" method.

Once you have it, write down the settings (aperture, speed and ISO). These will be the test settings that you'll use in the **PhotoPills** long exposure calculator.

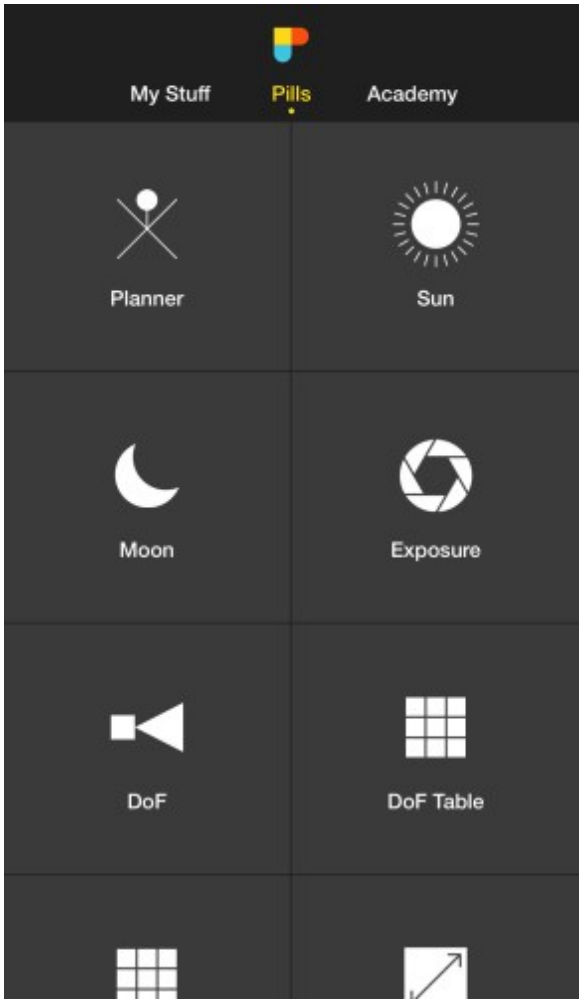
By the way, if you need help exposing your photos, you should read the **'Exposure in Photography: The Definitive Guide'** :P

Test shot: Nikon D4s | 18mm | f/16 | 1/8s | ISO 100 | 6250K

2. Open the PhotoPills long exposure calculator

Open **PhotoPills** and tap on *Exposure* (*Pills* menu). This takes you to the **long exposure calculator**.

In the calculator, tap on *Calculate* at the top of the screen, and choose that the setting you want to calculate is the *Shutter speed*.

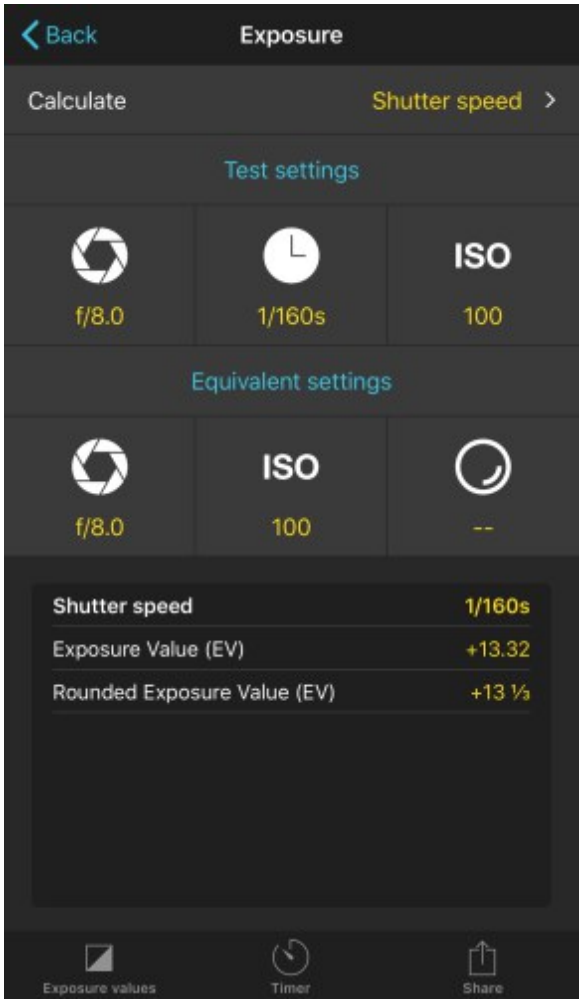


PhotoPills - Pills Menu. Tap on Exposure to open the long exposure calculator.

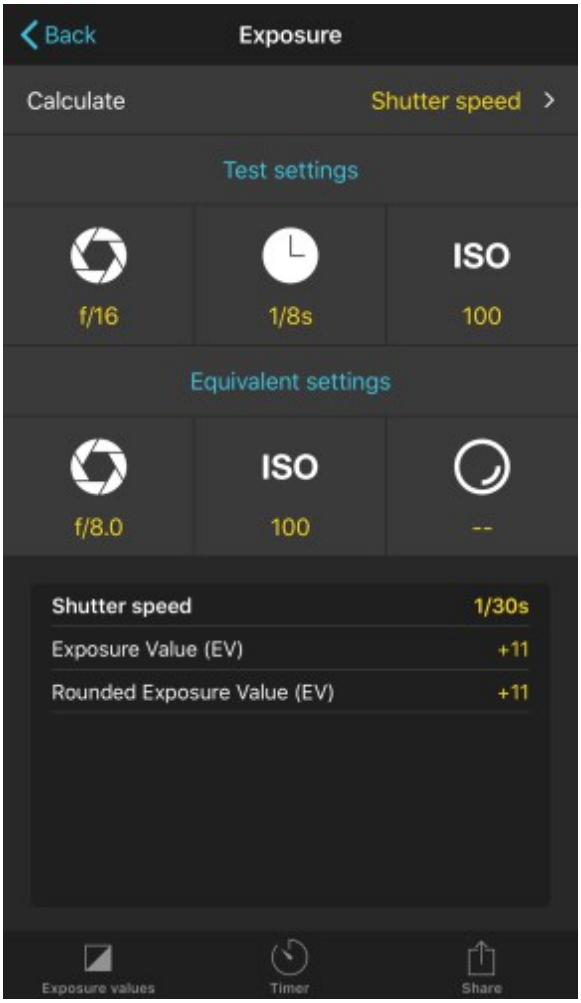
PhotoPills - In the long exposure calculator, set the Shutter speed as the setting you want to calculate.

3. Enter the test settings in the long exposure calculator

In the long exposure calculator, enter as *Test settings* the aperture (f/16), shutter speed (1/8s), and ISO (100) of the test shot, the correctly exposed picture of the scene (without the filter).



PhotoPills - Long exposure calculator once the Shutter Speed is set as the parameter to calculate.

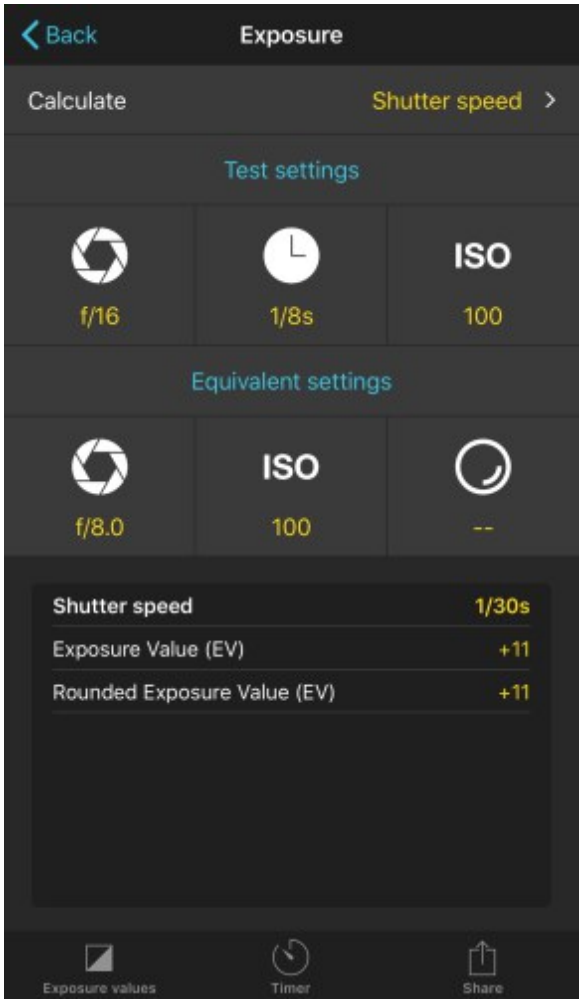


PhotoPills - Enter the test settings in the exposure calculator (f/16 for the aperture, 1/8s for the shutter speed and ISO 100).

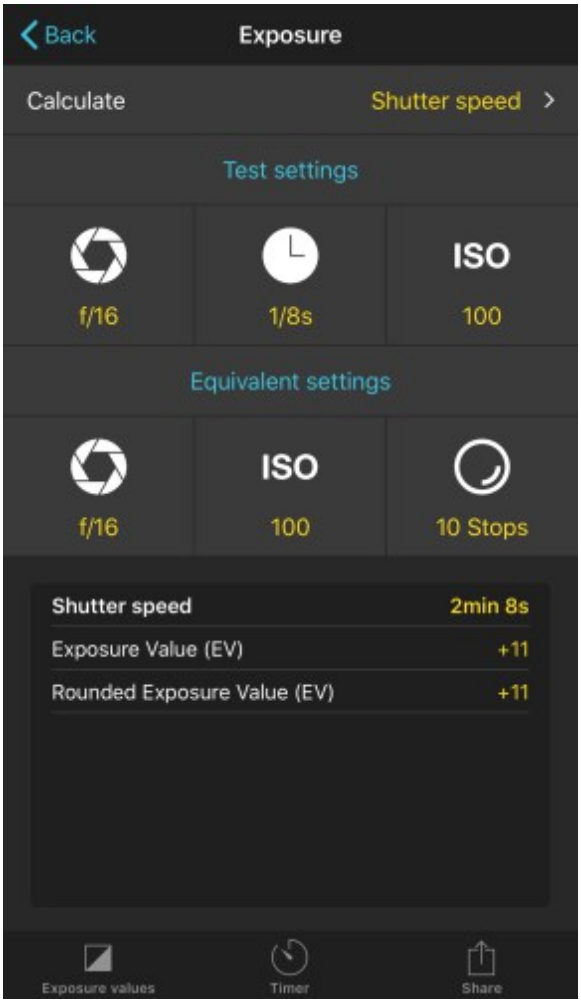
4. Enter the equivalent settings in the long exposure calculator

Now, enter in the *Equivalent settings* section the aperture (f/16) and ISO (100) you want to use in the final picture. This will depend on the **depth of field** you want and the level of noise you're willing to assume. Finally enter the stops of light that your ND filter actually subtracts, the actual density (ND 3.0 10 stops).

Once you enter the settings, the *Equivalent shutter speed* shows up as the first result in the bottom table. This is the shutter speed you should use to get the same exposure as in the test shot.



PhotoPills - Long exposure calculator after entering the Test settings (f/16 aperture, 1/8s speed and ISO 100).



PhotoPills - Enter as Equivalent settings the aperture (f/16), ISO (100) and your filter' stops of light (10 stops) to calculate the shutter speed (2min 8s).

5. Take the picture and check the result

Place the filter holder on the lens and insert the ND filter (ND 3.0 10 steps). Enter the aperture (f/16), ISO (100) and equivalent shutter speed (you just calculated it with the long exposure calculator, in this example 2min 8s).

If you have a mirrorless camera (with an electronic viewfinder) or a DSLR with this option, use the live histogram to check the exposure. It's a great tool if you use filters of 6 stops or less. With denser (darker) filters the camera will most likely not be able to expose.

Then, take a picture.

Nikon D4s | 18mm | f/16 | 2min 8s | ISO 100 | 6250K | ND 3.0 (10 stops) filter

The **histogram** of this last picture should match the histogram of the test shot. Both are correctly exposed :)

Now look at the picture.

Did you get the effect you were looking for according to the shutter speed? Or regarding the **depth of field**?

6. Adjust the shutter speed if necessary

If you feel you need a slower shutter speed, go back to the **PhotoPills** long exposure calculator. In the equivalent settings, enter a smaller aperture or a lower ISO (always taking into account the depth of field you want and the noise you're willing to assume). These changes will give you a new (slower) shutter speed value.

If you use small apertures (large f-number), be careful with **diffraction**. Yes, when you set apertures larger than f/16 the exposure time is longer. But at the same time, you get a less sharper image, with less detail.

If you want a faster shutter speed, you can use a larger aperture or crank up the ISO.

7. Take a new shot and check the image

Finally, with the filter on, take a second shot with the new aperture, ISO and shutter speed settings...

If you got the picture you wanted, perfect!

If not, repeat the previous step and keep trying until you get the photo you're looking for.

Keep in mind that when you use an ND filter at **Sunrise** or **Sunset**, the light changes very quickly, sometimes in just a few seconds (especially in winter).

Suppose you want to take a picture with a shutter speed of, for example, 5 minutes at the time the Sun is near the horizon. During those 5 minutes the light that reaches the sensor will vary gradually.

Be cautious and try to compensate for the exposure depending on the density of the filter.

Exposing with two or more ND filters

Exposing with two or more ND filters is very simple.

Just follow the same workflow I just explained when using an ND filter... But use the sum of the filters' densities to calculate the equivalent shutter speed.

For example, if you use a 3-stop ND filter with a 6-stop ND filter, the effect will be the same as if you were using a 9-stop ND filter (3 + 6). Add the densities together.

So remember, when calculating long exposures with **PhotoPills**, use the sum of the densities of the filters you're going to use.

It's super easy!

Section 10:

How to expose using a GND filter (and a reverse GND)

Nikon D4s | 200mm | f/11 | 0,6s | ISO 100 | 6500K | ND 1.8 (6 stops) and soft reverse GND 0.9 (3 stops) filters

The exposure is so important in any photography genre that one day I took the plunge and ended up writing **a several hundred pages long guide about it**... :O

And if you want to take a photo with one or more GND filters, the exposure is even more important.

After all, that's what you're using the filters for, isn't it?

What are the features of a GND filter?

What is a GND filter (and a reverse GND filter)

Graduated neutral density filter

The graduated neutral density (GND) filter is a piece of glass or resin that you can place in front of your lens.

But unlike an ND filter, the density of the GND filter varies gradually along its surface. If you put it against a light source and you handhold it vertically, you'll see that the area near one of the short edges subtracts more light than the opposite area.

If you want to know more about them, take a look at **section 2**.

Reverse graduated neutral density filter

The reverse graduated neutral density (GND) filter is a variation of the GND filter.

This filter has the darkest part (the one that determines the density of the filter) in the central portion. At the same time, this opaque part becomes progressively transparent towards the upper portion. On the other hand, the lower half is completely transparent.

That's why it's called reverse.

You'll find much more information about this filter in **section 2**.

Exposing with a GND filter

As I explained in **section 2**, GND filters are useful filters for high **dynamic range** scenes. That is, scenes where the highlights are very bright and the shadows are very dark.

The challenge with this type of scenes is that your camera is not able to capture the whole scene in just one frame. You have to choose between exposing the highlights correctly, and so the shadows would be clipped. Or expose the shadows correctly and then blow out the highlights.

Another solution would be to use the **bracketing** technique: take several shots, each one with a different exposure, and then blend them in post-processing.

A GND filter reduces the dynamic range of the scene. By having a dark and a transparent area, you can darken the portion of the scene where there is more light while not touching the darker portion of the scene. Thus, the camera can capture detail in both the darkest and brightest areas.

To correctly expose the photo the first thing you need to find out is what GND filter you need.

To do this, you should divide your scene into two areas: **the brightest area of the scene** (where you'll place the darkest part of the filter) and **the darkest area of the scene** (where you'll place the transparent part of the filter, where it doesn't have an effect).

Then, calculate the difference in light stops between these two areas. This stop difference corresponds to the density of the GND filter you need. You can use the **PhotoPills** long exposure calculator for all calculations.

Finally, take the picture with the settings (aperture, speed and ISO) that allow you to correctly expose the darkest area of the scene. Obviously, take it using the GND filter so you can capture detail in the brighter areas.

In short, when using a GND filter expose following these steps:

1. Meter the light in the darkest area of the scene, where you will place the transparent part of the filter

Nikon D4s | 18mm | f/16 | 6s | ISO 100 | 5850K

Unfold your tripod and mount the camera on it. If you have a mirrorless camera (with an electronic viewfinder) or a DSLR with this option, turn on the live histogram.

First, you have to visualize how you're going to place the GND filter. The scene has a darker area, where you want to place the transparent part of the filter, and a brighter area where you want the dark part of the filter to have an effect.

But wait. Don't put the filter in front of the lens yet.

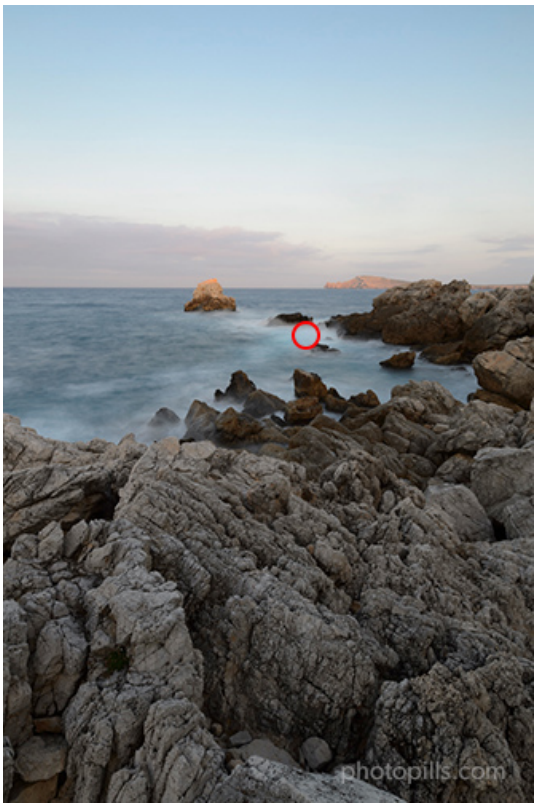
Now it's time to look for **the brightest tone in the darkest area of the scene**. In other words, look at the area of the scene where the filter is not having any effect (transparent

part), look for the brightest tone and meter the light right there.

Remember, meter the light of the brighter tone without the GND filter!

To do this, use the **spot metering mode** and meter with the **Manual shooting mode (M)**. Adjust the aperture, speed, and ISO so that the light meter is centered at zero.

In the photo I'm using as an example, I metered the light in the sea foam of the waves, which was the brightest tone in the lower area of the scene. That is, the area where I wanted to place the transparent portion of the filter.



The sea foam is the brightest tone of the dark area. That is, the area of the scene where you'll place the transparent part of the GND filter.

Once you have this first picture, write down the settings (aperture, speed and ISO). In the example above the settings are f/16, 6s and ISO 100.

It's important that you always use the spot metering mode and Manual exposure mode (M) to prevent the camera from compensating for the exposure. Otherwise, this would distort the result of your calculations.

2. Meter the light in the brightest area of the scene, where you will place the dark part of the filter

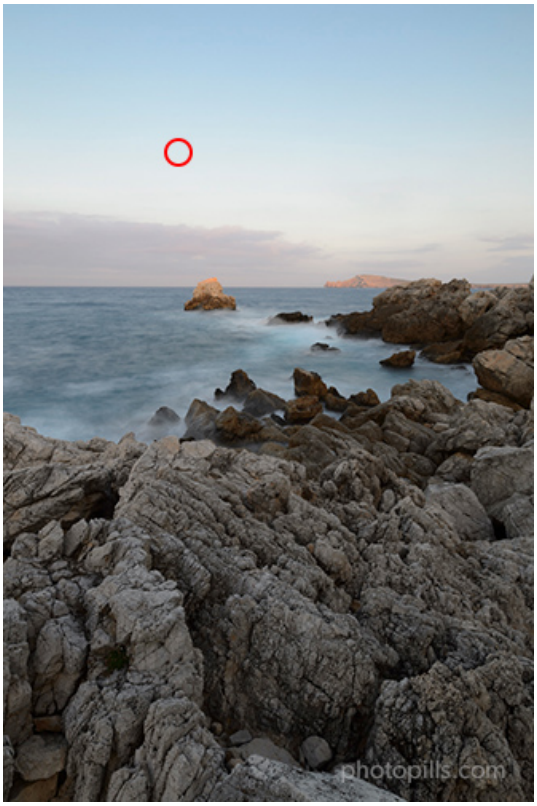
Repeat the first step, always without using the filter.

Take a second test shot, this time looking for **the brightest tone in the brightest area of the scene**. That is, look at the area that will be darkened by the filter (dark portion), look for the brightest tone and meter the light right there.

Again, remember that you have to meter the light without the GND filter ;)

Now, use the **spot metering mode** and meter with the **Manual shooting mode (M)**. Adjust the aperture, speed and ISO so that the light meter is centered at zero.

Back to the photo in this example, I metered the light in the brightest part of the sky.



The middle area of the sky is the brightest tone of the bright zone. That is, the area of the scene where the dark portion of the GND filter will have an effect.

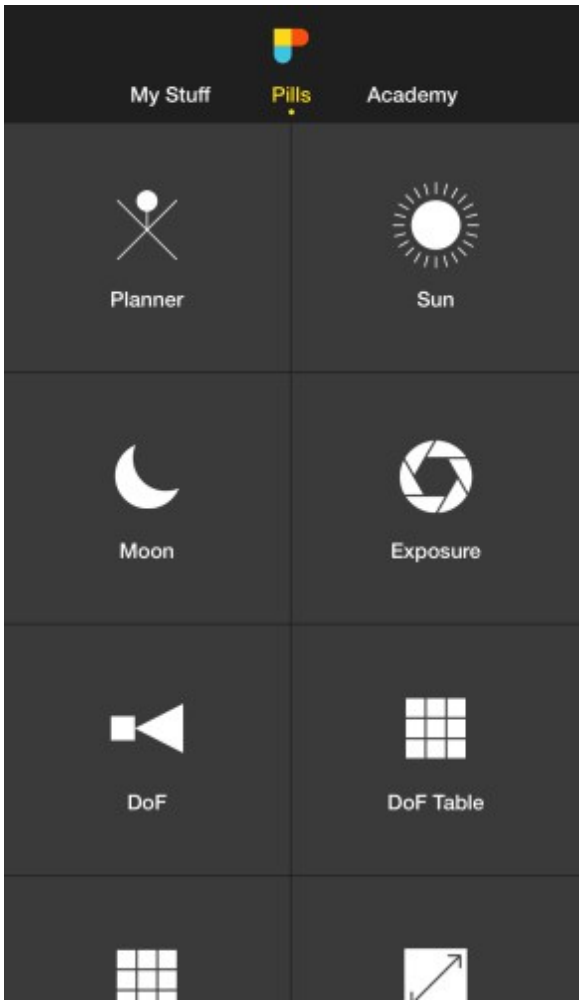
Once you have the second picture, write down the settings. Usually the aperture and ISO are the same and you only adjusted the shutter speed.

So in this example, the settings to expose for the (brighter) sky area are f/16, 1.6s and ISO 100.

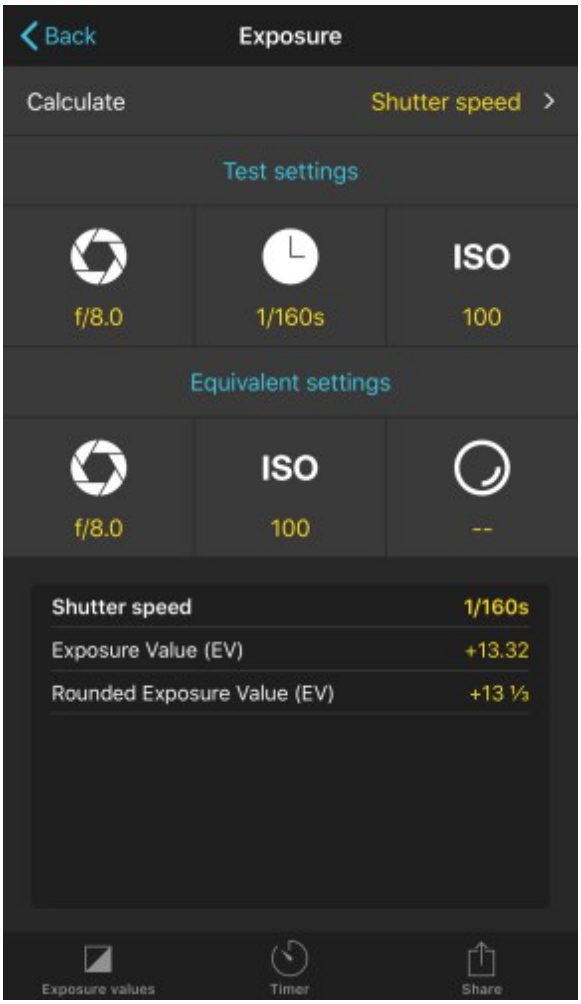
3. Calculate the exposure values of both areas

Now you need to know the exposure values (EV) of these two areas of the scene, the darkest and the brightest one.

Open **PhotoPills** and tap on *Exposure* (*Pills* menu). This takes you to the **long exposure calculator**.



PhotoPills - Pills Menu. Tap on Exposure to open the long exposure calculator.



PhotoPills - In the long exposure calculator, set the Shutter speed as the setting you want to calculate.

In the long exposure calculator, enter the *Test settings*. That is the aperture, shutter speed and ISO of **the first test shot** in which you metered the light in **the brightest tone in the darkest area of the scene**: f/16, 6s and ISO 100.

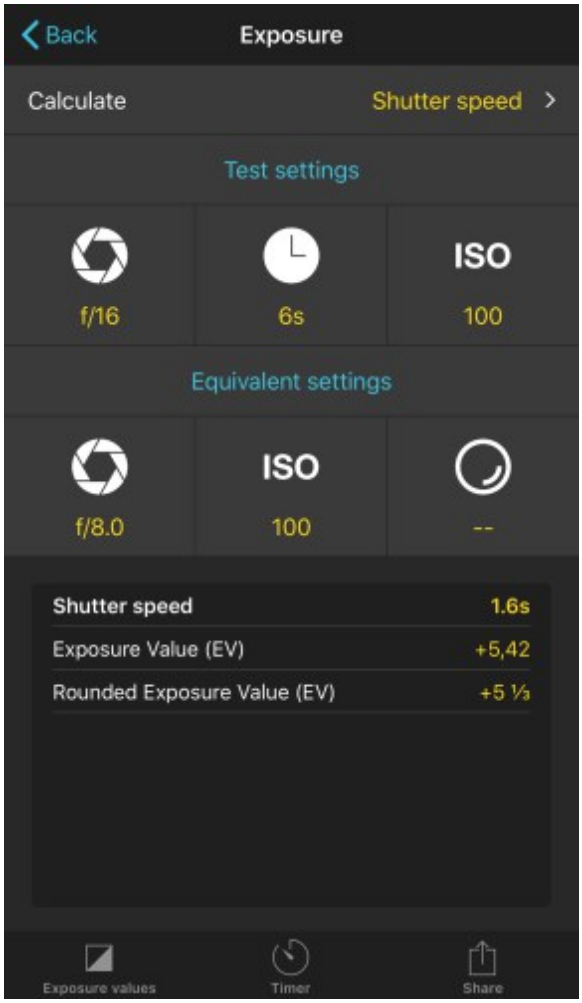
Look at the results at the bottom of the screen. More specifically the *Rounded exposure value* (EV).

That value is the EV of the darkest area of the scene: 5 1/3.

Now, repeat the process by entering as *Test settings* (aperture, shutter speed and ISO) of

the second test shot in which you metered the light in **the brightest tone in the brightest area of the scene**: f/16, 1.6s and ISO 100.

So now you have the *Rounded exposure value* (EV) of the brightest part of the scene: 7 1/3.



PhotoPills long exposure calculator - Calculating the EV (5 1/3) based on the brightest tone of the rocks (darkest area of the scene) and the test shot settings (f/11 | 6s | ISO 100).

PhotoPills long exposure calculator - Calculating the EV (7 1/3) based on the brightest tone of the sky (brightest area of the scene) and the test shot settings (f/11 | 1.6s | ISO 100).

4. Find out the density of the GND filter you need

The difference in exposures (7 1/3 - 5 1/3 = 2) tells you the stops of light between the two zones (2 stops).

These stops are precisely the ones you should compensate using a GND filter. In other words, they correspond to the filter density you need to match the exposure of the scene you want to photograph.

5. Select the GND filter you need

According to the meterings you've done in the scene and the calculations you've got with **PhotoPills**, now you know the filter density you need.

However, after years of experience photographing with filters, I recommend you to use a GND filter that has a density 1 or 2 stops lower if you want to get the most natural effect possible.

Another important thing is that the higher the density of the GND filter you apply to the sky, the brighter (or more illuminated) your foreground will be. You have to decide what do you want depending on the specific effect you're looking for.

If you have a mirrorless camera (with an electronic viewfinder) or a DSLR with this option, use the live histogram to adjust the exposure, usually by adjusting the shutter speed, until you get the photo you're looking for.

Once you become an expert there will come a time when you won't need to do any calculations to find out the density of the GND filter you want to use. Just by looking at the contrast of light between the highlights and the shadows, you'll be able to estimate with enough precision the difference of stops between the two areas. After many years taking pictures, that's my personal experience... :)

6. Take another test shot and check it

Nikon D4s | 18mm | f/16 | 6s | ISO 100 | 5850K | Soft GND 0.6 (2 stops) filter

Finally, put in the GND filter.

Your camera is still in **spot metering mode**, so meter **the brightest area of the scene** you want in detail and overexpose it by 1 or 2 stops (+1EV or +2EV), or respecting **your camera's overexposure limit**.

Finally, recompose, focus and shoot. A little further on this guide, I'll detail these last three steps.

Let's go back to this second shot you're working on.

The filter will reduce the light that reaches the sensor in the brightest zone, reducing the dynamic range of the scene... If you got the photo you wanted, perfect!

Otherwise, repeat the previous step and keep trying until you get the photo you want.

If you use a reverse GND filter, the workflow is exactly the same as with a GND filter.

Calculate the density you need by metering the difference in light stops between **the brightest tone of the darkest area and the brightest tone of the brightest area**. Use **PhotoPills** to calculate the exposure values (EV). Remember that in a reverse GND filter, the darkest part is in the center of the filter.

Finally, put in the filter and expose taking into account **the brightest area of the scene**.

Exposing with a GND filter and a reverse GND filter

Sometimes you'll face certain scenes with quite challenging light conditions.

Imagine that you are on the coast, with a beautiful seascape in front of you. You have the beach and some rocks in the foreground, a clear horizon and the sky with some fantastic clouds in the background. In addition to this, the Sun is about to set.

In this case, you'll most likely have to use a GND filter to correctly expose the highlights in the sky.

At the same time, you'll need a reverse GND filter to balance out the strong highlights happening during the **Sunset**.

To expose using both a GND filter with a reverse GND filter follow the steps below:

- If you have a mirrorless camera (with an electronic viewfinder) or a DSLR with the live histogram option, turn it on. It will help you control the exposure when using filters.
- Determine the GND filter you need. Calculate its density by metering **the difference in light stops between the brightest tone of the darkest area and the one of the brightest area** (where you want to apply the filter). Use **PhotoPills** to calculate the exposure values (EV).
- Determine the reverse GND filter you need. Calculate its density by metering **the difference in light stops between the brightest tone of the darkest area and the one of the brightest area** (where you want to apply the filter). Use **PhotoPills** to calculate the exposure values (EV).
- Put the two filters in the filter holder and expose taking into account **the brightest area of the scene**.
- If you have the live histogram option, use it to adjust the exposure.

- Take a new shot and check the result.
- There will be a strip in the scene where the graduated part of both filters will overlap. So you will probably have to move the reverse GND filter with your hand during the exposure. You can learn this technique by reading **section 15**.

"Wait Toni, wait. What if I need to use two GND filters? How do I expose in that case?"

Given the wide variety of GND filters on the market and, above all, the ability of sensors to capture an ever-increasing **dynamic range** it's highly unlikely that you'll be using two or more GND filters simultaneously.

However, if you can't compensate the difference in light stops between the brightest and darkest area of the scene with a single filter, you'll need to use multiple GND filters.

Which ones? And how many?

The sum of the densities of the GND filters used has to be equal to the difference in light stops.

Imagine you need a GND 1.5 (5 stops) filter. If you don't have that particular filter, use two or more GND filters. You can combine for example a GND 0.6 (2 stops) filter and a GND 0.9 (3 stops) filter. So 0.6 + 0.9 = 1.5 (2 + 3 = 5).

But, as I was saying, considering how powerful the sensors are nowadays, you'll be able to capture the photo with the filter you have and then make some adjustments in post-processing.

Section 11:

How to expose stacking several lens filters (ND, GND and polarizer)

Nikon D4s | 17mm | f/8 | 70s | ISO 100 | 6250K | ND 1.8 (6 stops), soft GND 0.9 (3 stops) and polarizer filters

If you still don't know what an ND filter, a GND filter or a polarizer are, take a look at **section 2**.

And if you're not sure how to stack several filters in front of the lens, you can read more about it in **section 4**.

I explained you how to use the polarizing filter (**section 8**), how to expose with one or more ND filters (**section 9**) and how to do it with one or more GNDs (**section 10**).

Once you've learnt to use each filter separately, it's time to teach you how to expose when stacking them all.

When using a combination of filters that includes one (or more) ND filter(s), one (or more) GND filter(s), and the polarizer, expose by following these steps.

Step 1: Start working with the polarizer

You have all the details in **section 8**, but here's a brief summary in case you forgot:

- Put the polarizer in front of the lens.
- If your camera has it, turn on the live histogram option.
- Rotate the filter carefully until you get the desired effect.
- Meter the light to adjust the exposure. If you can, the live histogram will help you to do so. Then, focus.
- Take the picture and check the result.

Step 2: Determine the GND filter

The full explanation is in **section 10**, but here's a short list of the steps that you have to follow:

- Don't remove the polarizer. You have to meter the light with the polarizer on. Don't forget that it also subtracts light.
- Meter the light in the darkest area of the scene (use the spot metering mode in **the brightest tone of the darkest area**). Thanks to this metering you'll get the base exposure for your final photo. Adjust the camera exposure according to this metering. This will give you the base exposure settings (aperture, speed and ISO).
- Meter the light in the brightest area of the scene (use the spot metering mode in **the brightest tone of the brightest area**).
- Calculate the exposure values of the two zones with the **PhotoPills** long exposure calculator.
- Find out the density of the GND filter you need.
- Select the GND filter you need. If you can, use the live histogram to adjust the exposure accurately.
- Put the GND filter in the filter holder, making sure it's in the correct position.
- Take a new photo exposing for **the brightest area of the scene** and overexpose 1 or 2 steps (+1EV or +2EV), or respecting **your camera's overexposure limit**.
- Check the exposure looking at the **histogram**.

Step 3: Choose the ND filter and calculate the final exposure

In **section 9** you have a detailed description of the complete workflow. But here's a summary to calculate the shutter speed you need when using an ND filter:

- Open the **PhotoPills** long exposure calculator.
- Enter the *Test settings* in the long exposure calculator. These are the base exposure settings, that is the exposure allowing you to expose correctly using the GND filter. You calculated it in the previous step.
- Enter the *Equivalent settings* in the long exposure calculator. These are the settings you'll use in the final shot: aperture, ISO and the actual density of your ND filter.
- **PhotoPills** tells you the equivalent shutter speed when using the ND filter (and thus keeping the same base exposure).

Step 4: Take the picture with the polarizer, the ND filter, the GND filter and the final exposure

Now you have the equivalent aperture, ISO and speed. Also, when doing the calculations, you should mount the filters in the corresponding order (**section 4**).

Remember that first you have to put the polarizer. Depending on the system you use, the polarizer will be the filter closest to or furthest from the sensor.

Then you have to slide the GND filter, adjusting its position to ensure that the darkest zone is exactly where you want it to be.

And finally, you have to slide the ND filter, always closer to the lens than the GND filter.

Now, if your camera has it, use the live histogram option to adjust the exposure accurately.

Finally, take the picture and use the **histogram** to check that you've got the correct exposure.

Oh!

And enjoy the stunning image you just captured!

Section 12:

How to expose using a light pollution filter

Nikon D4s | 35mm | f/1.4 | 6s | ISO 6400 | 4000K | Pure Night light pollution filter

Now let's see how you can get the exposure you're looking for after putting a light pollution filter in front of the lens.

But before that...

What is a light pollution filter

It's a specific filter for night photography and astrophotography. It helps to reduce light pollution caused by sodium vapor bulbs. They cast a very annoying orange glow on the scene and they reduce contrast and sharpness.

Read more about this filter in **section 2**.

How much light does the light pollution filter subtract

I can't give you an exact number of stops as it depends on the model. Manufacturers indicate the density of the filter. But as with ND filters, it's best to check the actual filter density yourself (**section 3**).

Exposing with a light pollution filter

You expose in exactly the same way as if you were exposing without a filter. Let me explain you the workflow step by step:

- Mount the filter holder carefully and try to avoid moving your tripod and camera. Slide the filter into the filter holder.
- Use the largest aperture you can (the smallest f-number) to capture as much light as possible, use the highest possible ISO depending on the noise your camera produces and determine the shutter speed depending on whether you want the stars as spots or not (use the **NPF rule**).
- Focus. You'll usually focus at the **hyperfocal distance**. If you have used the autofocus and you're not using the back button focus, don't forget to change it to manual mode. This way you'll avoid refocusing by mistake by pressing the shutter button...
- Mount your camera on the tripod and work on your composition looking for the angle you like.
- Take a test shot and check the **histogram**.
- If necessary, adjust the exposure by modifying the ISO or shutter speed. Change the color temperature manually. The light pollution filter usually has a cool cast on the image.

There's one small detail you need to keep in mind.

You're using a filter in pitch black light conditions, so you have to be very careful with any light that comes directly into the lens (and the filter). It could generate flares that will ruin your photo.

This explanation is a quick cheat sheet that will help you to expose without trouble whenever you need to use a light pollution filter.

But if you want to become a master of night photography or astrophotography, I suggest you study the following guides in depth:

- **'Milky Way Photography: The Definitive Guide'**
- **'Star Trails Photography: The Definitive Guide'**

Section 13:

How to expose using an infrared filter

Nikon D200 | 18mm | f/9 | 85s | ISO 200 | 2000K | Hoya R72 (720 nm) infrared filter

Let me show you how you can expose using an infrared filter.

And to do that, let's start first by going over a couple of things.

What is an infrared filter

An infrared filter has a very specific use: to block visible light. In other words, the light your eyes see and the light your camera's sensor is able to capture.

Therefore, the only light that it lets going through the lens and reaching the camera's sensor is the infrared light.

There are two types of infrared filters:

- **External**. They are filters that you place in front of the lens.
- **Internal**. A filter that you can put directly on the sensor and that transforms your regular camera into an infrared one.

Check a couple of things before you start

Exposing with an infrared filter is not exactly easy as it depends on several factors such as the camera model and the density of the filter you're using.

First, the camera. You should know the tolerance of the low pass (or infrared blocking) filter of the sensor. This tolerance varies depending on the amount of infrared spectrum you let through. Not all cameras have the same ability to capture these types of images.

In other words, you need to know **if your camera is capable of taking infrared pictures or not**.

Finally, you also need to find out **if your lens is suitable for infrared photography**.

Exposing with an infrared filter

To expose with an infrared filter you should follow the same workflow as when using an ND filter (**section 9**). However, in this case the exposure will depend on the low pass (or infrared blocking) filter of the camera and the infrared filter you use.

A small note before I go on.

The **low pass filter** is a filter that is placed in the sensor to avoid the effects of **aliasing** or **moiré**.

So before working on your shot, you should calculate the light stops that the combination of the infrared filter and your camera's low pass filter subtracts. To do this, follow the steps I detailed in **section 3**.

And when you're in front of a scene you want to photograph, follow these steps to expose for it:

- Always shoot in RAW.
- Choose a lens that doesn't show hot spots. Infrared photography produces this effect on certain lenses. A hot spot is a circular area in the center of the image. Its size is more or less large depending on the aperture, and it has a much brighter or different color compared to the rest of the image. These circles are generated due to the anti-reflective coating that some lenses have. **Take a look at this list to see if your lens suffers from an infrared hot spot**.
- Don't mount the infrared filter yet. Select a maximum aperture of f/8 and focus. Infrared light has a longer wavelength than visible light, so your camera won't be able to focus and it will do so at a different spot in the scene. Using this aperture, you'll get all

your photos in focus.

- Continue working without the infrared filter. Now, meter the light in **the brightest tone of the scene** and take a picture of the correctly exposed scene (check the **histogram**). Later on, during the post-processing, this shot will also be very useful for calibrating the white balance.
- Screw the infrared filter onto the lens. I almost always use the **Hoya R72** which, together with my Nikon D4s camera, subtracts 15 light stops (it's its real density). Use the method I explain in **section 3** to calculate the light stops that both the infrared filter and your camera actually subtract.
- In order to avoid a completely red picture, use a cool white balance of about 2300K. You'll get a light brown image on the LCD screen of your camera so you'll be able to see the detail and textures on the photo.
- Now that you've mounted the filter, adjust the ISO again by selecting the lowest possible ISO to get the effect you want.
- To calculate the exposure time you need to get the correct exposure, use the **PhotoPills** long exposure calculator, as I explained in **section 9**. This result will actually be a first guess, but it won't be exactly right. When you put the filter on, the camera is no longer capturing visible light, but infrared light. So the correct exposure time will be determined by the amount of infrared light present in the scene.
- Take a second picture with the aperture, ISO and the exposure time you calculated in the previous step.
- Finally, check that the picture is in focus and correctly exposed (check the **histogram**).

If you have a mirrorless camera, you can check the **histogram** as you change the exposure triangle settings. And if you're using a DSLR camera, make sure you always have the viewfinder covered while you're taking the picture because the high density of infrared filters can produce light flares and ruin the shot.

As I said before, if this is your first time using an infrared filter, you should calculate its actual density. That way, when you use it in future shooting sessions you can calculate the equivalent settings to adjust the exposure quickly and efficiently.

Oh, one last tip.

Whenever you can, take your photos during the central hours of a sunny day: that's when there's more infrared radiation.

Section 14:

How to expose using a solar filter

Nikon D500 | 500mm | f/8 | 1/250s | ISO 100 | 6450K | Baader solar filter

This type of filter is used to photograph the Sun. And you can also use it to photograph a solar eclipse. But not for all its phases, only in the **partial phases of a solar eclipse**.

What is a solar filter

You can use a solar filter to photograph the Sun or a solar eclipse only.

If you plan to capture this incredible phenomena, you must do so with a solar filter. If you don't, you risk from damaging your camera severely: both the camera sensor and focusing system will be burnt by the Sun as soon as you shoot your first picture!

You can find more details about the solar filter in **section 2** and in **a section that I wrote about the equipment you need to photograph a solar eclipse**.

How much light the solar filter subtracts

A lot! XD

To give you an idea, the Baader solar filter I used to photograph **the eclipse of August 21, 2017 in the US** is the equivalent of an ND 5.0. So it subtracts 16.6 light stops...

How to use the solar filter

Let's see what steps you have to follow to use the solar filter.

1. Use the mirror lock up

Obviously, this step applies only if you're going to take photos with a DSLR. If you plan to shoot with a mirrorless camera, forget about it.

2. Put the solar filter on

It's very easy, although it depends on the model.

In the case of my **Baader solar filter**, it has special hooks that allow me to anchor it to the lens hood.

3. Focus

Before the eclipse begins, select the manual focus mode on your camera.

Turn on the Live View option (or the Focus Magnifier option if your camera has it) and zoom in the image as much as you can around an area of the Sun that you can see with detail.

Focusing on the edge usually works very well. This will help you get a tack sharp Sun in your picture.

Once you see detail in that particular area of the Sun, focus.

4. Select the Manual (M) shooting mode and meter the light

To make sure you expose the photo correctly, meter the light directly on the surface of the Sun **before the eclipse begins**.

5. Determine the exposure

You have to use the solar filter during the partial phases of the eclipse. Here, I recommend the following settings:

- Aperture: Use a relatively small aperture to get the Moon and Sun out in perfect focus.
- Shutter speed: According to the Sun metering, the aperture and the ISO, adjust the shutter speed so that the light meter is centered at zero (and your photo is correctly exposed).
- ISO: Use the lowest ISO you can (100 or 200).

In addition, to make sure you get a properly exposed photo, it's best to do a **bracketing** starting with a base shutter speed.

6. Take the photo and check the result

If you didn't get a photo with the exposure you were looking for, adjust one of the **exposure triangle** settings.

If you want to know everything you need to know to successfully photograph a solar eclipse, I recommend you study in depth **'Solar Eclipses: The Definitive Photography Guide'**.

Section 15:

Moving filters during the exposure

Nikon D4s | 18mm | f/5.6 | 12s | ISO 400 | 5500K | ND 1.8 (6 stops) filter and soft reverse GND 0.6 (2 stops) filter in motion

Sometimes it can be interesting to move the filter manually while the camera is taking the picture.

"But what are you talking about Toni? Are you saying that I should take a filter with my hand and shake it?"

Actually, not as far as shaking it! :D

But you'll have to take it with your hand. I'll explain you how to do it in a minute.

Before this, let me tell you that this technique allows you to adjust the amount of light you subtract in each part of the scene. It also helps you to avoid the filter's transition line between the dark and bright areas on the photo.

However, it's not easy to put this technique into practice. It's very difficult to control how the final photo will look and it requires a lot of practice.

If you're interested in practicing this technique, I suggest you take a look at **'El uso de los filtros en movimiento'**, an article written by my friend José B. Ruiz in which he explains it in great detail. Unfortunately, this article is only available in Spanish.

Although I'm not going to be able to explain it as well as he does, I'm going to try my best. So keep reading to learn more about this technique.

What is this technique about

What filters do you need

You'll usually apply this technique with hard GND filters and reverse GND ones.

But not exclusively.

As I said a few paragraphs above, this technique is a craft so there are no specific rules or red lines. As you'll have to practice a lot to master it, try all kinds of filters, experiment and observe the results.

This is the only way to find out what you like best, what suits you best or what produces the best results in your photos.

What conditions do you need

Throughout this article you have discovered how some filters allow you to control the **dynamic range** of the scene, subtracting light in the areas of the scene where it's very intense. For example, thanks to the GND filter you can selectively darken the highlights to avoid getting them overexposed in the photo.

So in order to move a GND filter during the exposure, you need a scene with a high dynamic range.

At the same time, you need the exposure time to be long enough to move the filter. To do this, you need a low-light scene or use an ND filter.

As you have learnt throughout this guide, you manage to subtract light from the scene thanks to the ND filter and thus, have a longer exposure time. In other words, you can use a slower shutter speed.

What is this technique about

It's very simple (to explain, applying it is not so easy).

From the moment you press the shutter and the exposure starts, you have a certain time (the time you've set yourself through the shutter speed) to move the filter.

How can you move it?

You can move the filter in two ways:

- Sliding it up or down while it's in the filter holder, without removing it.
- Holding it with your hand in front of the lens, always as close as possible.

"And how fast do I have to move it, Toni?"

Oh young padawan, that's the key question here!

That's where the "try and fail" technique comes in. You'll have to adjust your movements and the speed at which you perform them.

What is it for?

The main problem with a neutral density graduated filter (or a reverse one) is that it limits your composition.

Why?

Because all the elements that are above the horizon can look in the final image darker than the rest of the scene.

Depending on the scene and the shutter speed, the GND filter or the reverse GND can color cast that area of the frame. It looks much darker when it actually shouldn't be.

This is true for any soft GND filter. But imagine what can happen if you use a hard GND filter. You run the risk of getting a dark band that completely ruins your photo.

"I can fix that mess in a breeze in post!"

You're right.

This problem can be solved with a post-processing software like **Photoshop**. But in order to do this you must know how to use, for example, luminosity masks.

That's what filters are for. So that you don't use additional tools that force you to spend more hours in front of the computer than taking pictures.

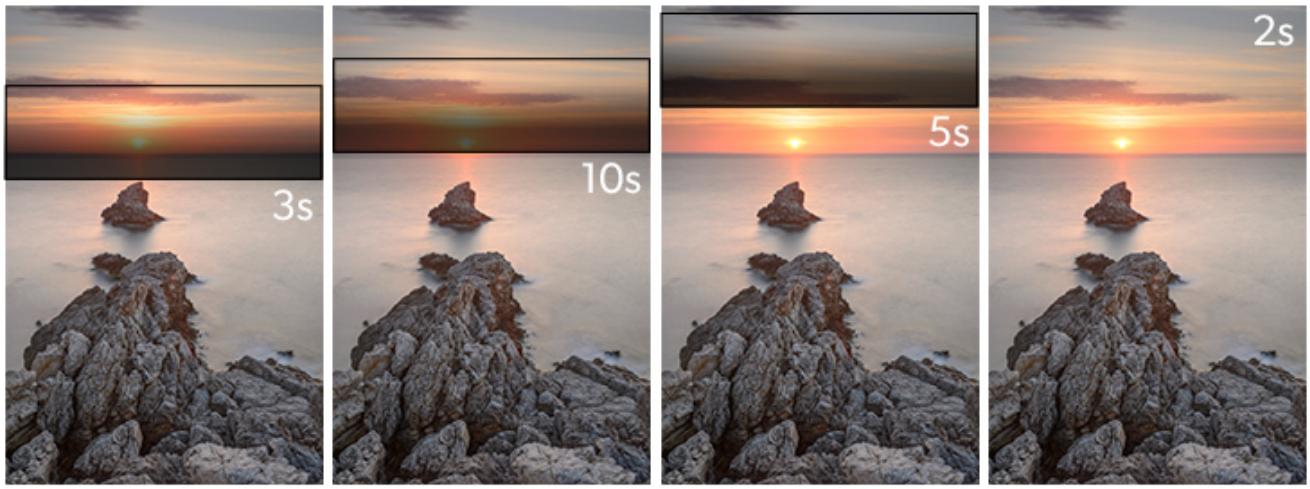
Look at these two pictures.

See that dark triangle in the image on the right? It's there because the part of the rock above the horizon is affected by the GND filter dark portion.

You can solve this problem while moving the lens filters during the exposure. Here, for example, you can move it up and down and even remove it from the filter holder at the end of the exposure. And you prevent that part of the rock from being underexposed.

How you can do it

As I told you before, this technique is not easy. The only way to master it is by using the "try and fail" method. And practice a lot, of course.



This diagram is perfect to show my workflow when I decide to move the GND filter during the exposure.

Have a look at the scene.

It's a beautiful **Sunrise** in Cabo de Cavallería (Menorca, Spain). I worked the composition in such a way that the rocks form a triangle whose vertex guides the spectator's eye into the Sun rising above the horizon.

And, as always during Sunrises and Sunsets, I had to face a scene with a high **dynamic range**.

Whenever there is a high dynamic range, I use a GND filter to counteract the highlights so they don't blow out. In this case, the Sun (highlights) is very close to the horizon, in the central area of the frame. So I need a reverse GND filter.

But I don't want the filter to remain in the same position in the filter holder throughout the exposure. I would like to avoid getting a dark area in the photo. So I have to move it...

These are the steps I follow to move the filter (a reverse GND, in this case):

- Insert the filter into the filter holder until the darkest area covers a small strip below the horizon.
- After a few seconds (one fifth of the total exposure time or a little less) slide the filter

up until it's just above the horizon.

- After a few seconds (about half of the total exposure time) slide the filter a little higher. Leave it there for a few more seconds (also about a fifth of the total exposure time).
- During the last few seconds, slide it a little more or remove it from the filter holder.

This workflow is the result of my experience and the conditions of each photo. But it doesn't mean that it works in every single case. You'll have to learn on you own how to tweak the filter positions and estimate how long it needs to be in each one of them.

But, be careful, because if you leave the filter there and you don't move it at all or if you don't remove it before the end of the exposure, your sky will be too dark (underexposed) in the picture.

Back to the example of Cabo de Cavallería, you can see in the diagram where in the frame is the darkest portion of the reverse GND filter.

The total exposure time is 20s. During that time:

- I keep the filter 3s below the horizon, covering the Sun.
- I move the filter until the edge of the darkest zone overlaps the horizon and I keep it 10s in that position.
- I keep sliding the filter up, until the darkest zone is not covering the Sun anymore but it still covers part of the sky, and I keep it 5s in that position.
- Finally, I take the filter out of the filter holder. Then, I expose the last 2s without the filter.

As you can see in the final photo, there are no dark stripes anywhere in the frame.

Nikon D4s | 35mm | f/11 | 24s | ISO 100 | 7000K | ND 1.8 (6 stops) filter and soft reverse GND 0.6 (2 stops) filter in motion

In addition to moving the GND or reverse GND filter, you can cover the lens a certain number of times during the exposure.

So what you actually do is blocking the light in a very precise way with another filter, an ND for example, in that specific part of the frame that you consider necessary (to avoid a back-light, for example). By doing this, you subtract a bit more light in those areas that could be potentially blown out, while preserving all the detail in the shadows without clipping them.

You don't need to use another filter. You can also use a black card (**section 2**), a piece of black cloth, the lens cap or even your own hand.

Some suggestions

Finally, let me give you some suggestions that will help you apply and master this technique:

- Moving filters during the exposure is a difficult technique to learn. You'll need time and many attempts to master it – practice endlessly and whenever you can!
- As I told you in **section 2**, I recommend using glass filters whenever you can. It's a better quality material, gives better results and produces fewer side effects, although these filters are more expensive.
- Obviously, the higher the **dynamic range** of your camera, the better the result. But you already knew that, didn't you?
- Be careful and avoid light entering through the optical viewfinder to avoid light leaks (forget about it if you have a mirrorless camera).
- You'll often face difficult scenes. For example, when you have the light source in front of you and one or more irregular shaped elements are above the horizon. In these cases, try to combine some of the techniques I just explained to you.
- If you don't get the photo, don't get frustrated. Try again, persist and be patient. And if it's really impossible, it's ok. This technique is not infallible.

Great!

You now know how to expose in any situation, no matter the type or the number of filters you use :)

You're becoming a master!

But don't stop here. Keep reading...

In **section 16** I describe all the steps you should follow when taking a photograph with filters.

And in **section 17** (my favorite) I explain step by step a lot of examples that I've captured thanks to the filters.

Here we go!

Section 16:

How to shoot with lens filters step by step

The time has come.

The shooting day of the photo that you've planned with so much effort is here.

Everything is ready. Your pulse accelerates and you get butterflies in your stomach...

So, from PhotoPiller to PhotoPiller, let me give you my best piece of advice.

Get to your shooting spot in advance

You should always arrive well in advance to the location (2 or 3 hours at least). The last thing you want is to have to run to get the shot.

Patience is a virtue.

So you'll avoid making mistakes.

Get there early and scout the location so you can:

- Confirm your plan with **PhotoPills**. Adjust the shooting spot and even the shooting time.
- Check that you can access it easily and that there are no potential dangers.
- Discover different corners or spots that offer a different and/or complementary point of view to the one you had in mind.
- Work on your composition. It takes time, calm and patience to find the perfect composition. Or at least the one that is perfect for you.

Regarding this last bullet point, you should learn to work with your imagination: a photograph shot with filters can show a scene in a very different way than how your eyes see it. Therein lies the power of its magic ;)

That's why it's so important to try to anticipate how the silky water will look, in which direction the clouds will move... And anything else that can help you create a composition that enhances the image.

Place the tripod, ballhead, camera, and lens

Once in the field, place the tripod on the planned shooting spot (**section 6**) and make sure it's stable.

Mount the camera along with the lens on the ballhead. Check that all the the gear is securely mounted to avoid any vibrations during the long exposure.

It's time to work on your composition.

Include the elements of the scene you want to include in your composition.

Do you want a wide frame? Use a wide angle lens and a focal length of 14mm, 18mm or 24mm for example.

Would you prefer to narrow the scene a bit more? Choose a longer focal length: 85mm or 105mm for example.

These decisions will help you determine if the lens you have on your camera is the right one. If it isn't, or you've changed your mind about the composition, remove the lens and put another one.

Remove the UV filter

Using a UV filter doesn't make any sense (**section 2**).

This type of filter slightly reduces the sharpness and contrast of your images. But it can also cause reflections, halos and flares.

If you usually have a UV filter screwed onto your lens, remove it as soon as you start preparing the equipment.

Prepare the filter(s)

Depending on the effect you want to get, you'll need one filter or another. Use the filter you need:

Filter	What is it for?
Ultaviolet (UV)	Blocks ultraviolet rays.

continues on next page

Table 1 – continued from previous page

Skylight	In film cameras, it offsets the bluish cast that some scenes can have.
Polarizer	Eliminates non-metallic reflections. Eliminates or enhances fog and rainbows. Increases saturation and contrast.
Gold-N-Blue Polarizer	Adds variable gold or blue tones to reflections depending on the orientation of the filter.
Varicolor Blue/Yellow Polarizer	Adds variable gold or blue tones to reflections depending on the orientation of the filter.
Neutral density (ND)	Reduces evenly the light that reaches the sensor. Increases the exposure time.
Graduated neutral density (GND)	Gradually reduces the light that reaches the sensor with greater intensity on one of the edges of the filter. Successfully captures scenes with a high dynamic range.
Reverse graduated neutral density	Gradually reduces the light that reaches the sensor with greater intensity from the center of the filter. Successfully captures a high dynamic range scenes.
Black card	Prevents light from reaching the sensor.
Infrared	Allows only infrared light to reach the sensor.
Light pollution reduction	Prevents sodium vapor bulbs from changing the color temperature of the night scene.
Solar	Allows to photograph directly the Sun or a solar eclipse preventing the sensor from capturing infrared (IR) and ultraviolet (UV) rays.

Screw on the lens the adapter ring and adjust the filter holder.

But wait. Don't slide any ND or GND filters into the slots of the filter holder yet.

Even if you already have a certain idea of what you want to capture, you have to check some details beforehand.

In the case of the polarizer you have several options.

You can screw it onto the corresponding adapter ring (if you have a system like NiSi's, for example) or onto the front of the filter holder (if you have a system like Lee's, for example). Or you can mount it later.

Turn off the lens stabilization system

You're using a tripod. Therefore, turn off the vibration reduction system or image stabilization system of your lens (VR/IS). This will prevent the lens from trying to eliminate vibrations that don't exist, and you'll end up with a less sharp image because of it.

Shoot in RAW

Always shoot in RAW!

The RAW format lets you take advantage of all the information captured by the sensor to produce better images. Make the most out of it.

Put the camera in manual (M) or semi-automatic (A/Av or S/Tv) mode

It's time to choose the shooting mode.

If you select the Manual (M) mode, you have total control over the exposure of your photos. You can choose the exposure time, aperture and ISO to get the exposure you want.

If you prefer the camera to help you, select one of the semi-automatic modes. Remember that with the Aperture Priority mode (A or Av) you choose the aperture and the camera decides the shutter speed. Conversely, with the Shutter Speed Priority mode (S or Tv) you set the shutter speed and the camera decides the aperture.

Select the spot metering mode

Thanks to the metering mode, you can determine the exposure in the **key tone**. That is to say, in that area of the scene where you want to know what kind of light you have and what settings you need to expose the photo correctly.

You don't have to get it right on the first attempt, so it's okay if you need to take several test shots before you get what you're looking for.

What if you need the polarizer to work on your composition? If you haven't done it yet, mount it now and rotate it until you get the effect you're looking for.

Once this is done, meter the key tone without any ND or GND filters in front of the lens so they don't distort the image exposure.

My recommendation is that, whenever it's possible, always use the spot metering mode. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV) or respecting **your camera's overexposure limit**. Then recompose, focus and shoot (although I'll give you more details on these last three steps later on).

If you're facing a scene where the light doesn't change too much, you can use the center-weighted metering mode.

Choose the focal length

To do this, adjust the focal length until you get the one that suits you, depending on the frame you want.

If your lens has a fixed focal length, move the tripod making sure you anchor it in a stable place and move the knobs on the ballhead so you point the camera in the direction you want.

Set the aperture

The aperture lets you control the **depth of field**, the area of the scene that's in focus in the picture.

Imagine you want to show the spectator what's happening in a larger area of the scene (increase depth of field). In that case, close the diaphragm (reduce the aperture to f/8, f/11, f/16).

To maximize the depth of field when using long focal lengths (70-500mm), use small aper-

tures (f/8, f/11, f/16) and focus on a point within the lower third of the scene.

If you're using short focal lengths (14-35mm), you can maximize the depth of field without using small apertures. Focus at the **hyperfocal distance** and problem solved.

On the other hand, if you open the diaphragm (increasing the aperture to f/1.4, f/2.8, f/4), the depth of field decreases. It helps you to direct the attention of the spectator to a specific point or area of the scene.

Set the ISO

The ISO setting depends on how much noise your camera produces. Start with the lowest ISO available on your camera (100 or 200).

If you're forced to work at too slow shutter speed, crank up the ISO gradually until you reach the balance between the noise produced and the shutter speed you need.

Decide the shutter speed

How much motion do you want to show to the spectator in the image?

A lot? A little?

Here are some examples of shutter speeds according to the effect you want:

- Waterfall silky water: 1s.
- Sea silky water: 1s.
- Show people moving, slow cars: 1/15s.
- Slow water motion: 1/2s.
- Fast water motion: 1/8s.
- People walking: 1/4s.
- Short star trails: 1min - 10min.
- Long star trails: 30min - 4h.

Remember that when photographing with filters, the shutter speed is essential. Depending on the filters that you have, you'll be able to increase more or less the exposure time.

So, once you know the effect you want in the photo, you should decide what filters will help you get the corresponding shutter speed. And at the same time getting a correct exposure (the right settings after playing with the **exposure triangle**).

Further down I explain you how to determine the exposure of your image, and how to change the settings to get the photo you're looking for.

Focus

In photography, focusing is critical.

If you're using a high-density ND filter, you'll probably have to remove it. The camera will be "blinded" by the filter and it will be very hard to focus. If you manage to focus, you'll probably do so in the wrong area of the frame.

"Yeah, but where do I focus?"

It depends! XD

It depends on which area of the scene you want to be perfectly focused and which area you prefer to be out of focus. In other words, it depends on where you want to position the **depth of field** in the scene.

You have several alternatives...

Maximize the depth of field with short focal lengths (focus at the hyperfocal distance)

When you're using short focal lengths (8-35mm) and you want to maximize the depth of field, focus at the **hyperfocal distance**.

For example, when you want the whole scene to be in focus, from the foreground to infinity.

The hyperfocal distance is just that, a distance.

When you focus at the hyperfocal distance, all the elements of the scene that are from half that distance to infinity are in focus.

I use it a lot for landscape photography, night photography, architecture...

In this video I show you how to focus at the hyperfocal distance.

Note: *If the main subject is at a greater distance than the hyperfocal distance, you should focus directly on the subject. You will lose some depth of field in the foreground but everything that is at infinity will remain focused and the subject will be tack sharp.*

You can calculate the hyperfocal distance very easily with the **depth of field calculator**.

Its value depends only on the size of your camera's sensor, the focal length and the aperture... Well, okay, it also depends on the **Circle of Confusion (CoC)**. You'll find all the details and explanations in the **'Depth of Field: The Definitive Photography Guide'**.

Maximize depth of field with long focal lengths (focus on a point within the lower third of the scene)

When you use long focal lengths, the hyperfocal distance is very long. So much so that you may not be able to focus at that distance.

In this case, the alternative is to focus at about a third of the frame (or scene) starting from the bottom.

You want a shallow depth of field

When you want a shallow depth of field to attract the spectator's eye on a point of the scene, focus on that point. You'll usually focus on your main subject.

How can you get a shallow depth of field?

As a rule of thumb, by opening the diaphragm (wider apertures), getting closer to the subject (smaller focusing distances) and using longer focal lengths.

"Perfect Toni. And now that I know where to focus, how do I do it?"

I love this question.

You have two alternatives: manual or autofocus.

Manual focus

Select manual focus on your camera or your lens.

Once you've decided where you want to focus, focus manually by slowly turning the focus ring on your lens.

To do this, use the Live View function on your camera's LCD screen to focus accurately. And if your camera has the Focus Peaking and/or Focus Magnifier options, turn them on as well as they will help you to be even more accurate.

Zoom in while the Live View is on, until you see the detail of your subject' surface.

Then, turn the focus ring of the lens slowly until the detail of the surface is tack sharp.

If you're not used to focusing manually, turn the focus ring very subtly and when you notice that your subject is focused, keep turning the ring until you go a little out of focus. Then, turn the ring in the opposite direction to get everything in focus again. This way you'll see very clearly how everything is now in focus again.

Autofocus

If you're not used to focusing manually, you can use your lens' autofocus.

Decide where to focus and press the shutter halfway until it focuses. Most cameras usually "beep" when they've focused correctly.

Then, change the focus mode of your lens from automatic to manual to prevent the camera from refocusing when shooting.

This is crucial. Don't forget to do this and you'll save yourself some trouble.

Another way to lock the focus is to assign the task of focusing to a button other than the shutter button. This way, you focus by pressing with your thumb another button on the back of your camera. And when you release it, the focus holds on the point you've chosen.

If you want to know how to set back button focus, take a look at your camera's user manual.

Put the filter (or filters), correct the exposure and take the photo

The exposure calculation depends on the scene you have in front of you, the photo you want to take and the filters you need to use to get it.

So far you've worked on the exposure without using any filter. Now is the time to put the filters on and adjust the exposure accordingly. So, depending on the filters you use you'll have to correct it one way or another.

Here is a brief summary of what you can achieve with each filter. I also detail the links to the corresponding sections so that you can learn to expose according to the filter (or filters) you use:

- If you want to eliminate (or accentuate) non-metallic reflections or a rainbow and you also want to increase the saturation of the scene, use a polarizer (**section 8**).
- If you want to convey motion slowing down the shutter speed or you need a wider aperture to have a shallower **depth of field**, use an ND filter (**section 9**).
- If you want to control the scene highlights, as well as improving the detail and color in the image, use a GND filter (**section 10**).
- If you want to photograph a Sunrise on the coast while the Sun is rising over the horizon, use a reverse GND filter (**section 10**).
- If you want to capture a Sunset while a silky sea hits the rocks and you want to show the seabed, stack different filters (**section 11**).
- If you want to reduce light pollution (an orange glow that ruins everything, reduces contrast and doesn't let you see the real color of the stars) in your night photos, use a light pollution filter (**section 12**).
- If you want to try something new to create surreal photos, use an infrared filter (**section 13**).
- If you want to capture the partial phases of a solar eclipse, use a solar filter (**section 14**).

Remember that whenever we refer to exposure, the **histogram** is your best friend. It will always be your reference point, so recalculate the exposure when the light changes.

Once you have **the exposure you're looking for**, try different framings and compositions.

You can also move the filters during the exposure... (**section 15**).

Get the most out of your creativity!

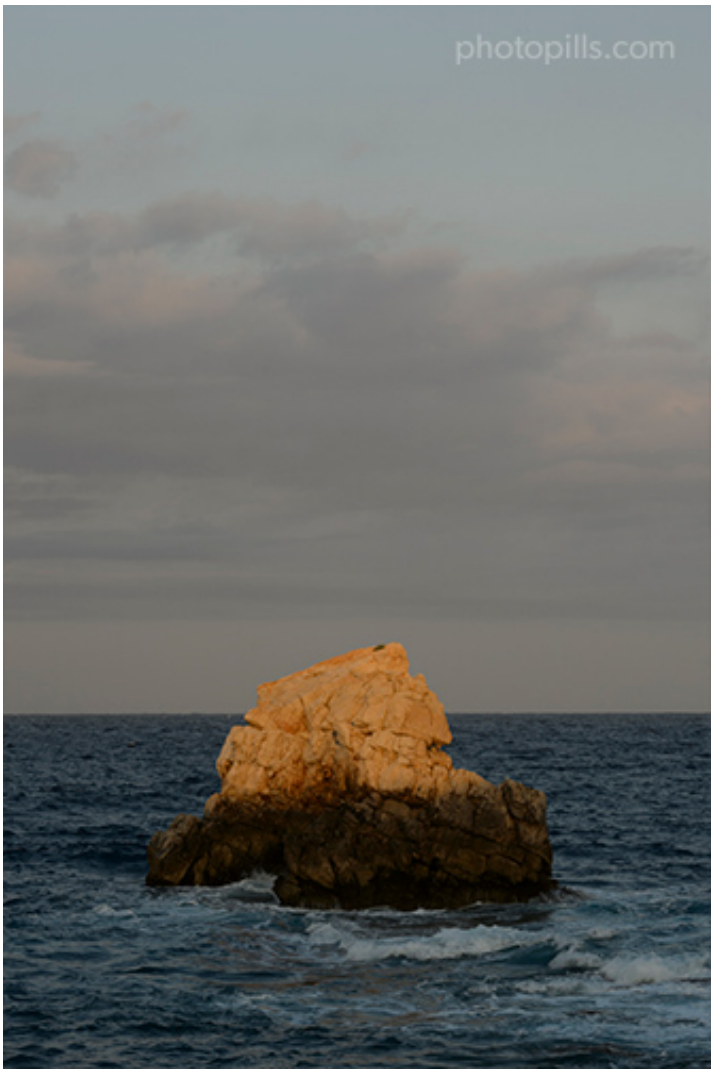
How to adjust the position of a graduated filter (GND and/or reverse GND)

Unlike other filters, graduated filters (GND and reverse GND) don't have an even density. Therefore, you have to position them precisely to avoid dark stripes on the photo.

Let's look at an example of how to place it (or them).

Imagine you're looking at a beautiful scene on the coastline. You have the sea, of course, and there's a rock not too far away that catches your eye.

Remember that **your eyes are much more precise than your camera** and are capable of exposing the scene correctly. Your camera, unfortunately, is not. It's very easy to check: try taking a picture and when you meter the light you'll see that you have to decide between exposing for the sky or for the rock.



Nikon D4s | 110mm | f/11 | 1/125s | ISO 100 | 5850K

Look at this first picture. With the naked eye and without seeing the histogram you notice that the sky is exposed correctly. The problem is that the rock and part of the sea are very dark (underexposed).

Nikon D4s | 110mm | f/11 | 1/15s | ISO 100 | 5850K

Look at this second picture now. It's the opposite: the foreground is correctly exposed (there's detail), but the sky is too bright (overexposed).

Fortunately, you can easily solve this problem: use a GND filter (**section 2**).

All right and now, what filter should you use and how?

If you've carefully followed the entire workflow, you need to decide on three features of this type of filter: density, transition and position.

Determine the GND filter density

You should always follow the same logic. Start determining the **density** of the filter you need. Do it according to the difference of light stops existing between the brightest tone of the brightest area and the one of the darkest area in the scene.

To calculate the filter density, follow the steps I explained in **section 10**.

In the scene we're using as an example, the difference in exposure values between the sky (brighter area) and the foreground (darker area) is 3 stops:

1/125s -> 1/60s -> 1/30s -> 1/15s

So use a 3-stop graduated filter (GND 0.9).

Decide the GND filter transition

In **section 2** I explained that a graduated filter can have two transitions (hard or soft) and the differences between them.

Therefore, the second step is to decide the filter **transition**.

Let's go back to the example of the scene with the sea and the rock. The scene doesn't have a clean horizon, the rock goes above it. So you should use a soft filter.

Adjust the GND filter position

And here comes the key moment: adjusting the filter **position**.

Where do you want to place the transition (the filter portion that goes from dark to light)?

If you take a GND filter with your hand and look through it, you'll see the transition zone more or less clearly. The problem is that by placing it in front of the lens, the transition is much less obvious when you look through the viewfinder.

Obviously, you'd like to slide the filter by placing the transition so that it matches the horizon of the photo (or the line that separates bright tones from the dark ones). But surprisingly, you'll get a more realistic photo by placing the transition slightly below the horizon.

In fact, the main problem is that if you place the filter, for example, with the transition too high relative to the horizon, the photo will have a very annoying bright strip just above the horizon.

You can see it in the next photo.

Nikon D4s | 18mm | f/16 | 1/3s | ISO 100 | 6250K | Hard GND 0.9 (3 stops) filter

Conversely, if you place the filter too low, your background or foreground elements will be too dark in the picture. Be particularly careful with those elements that are above the horizon such as trees, rocks or mountains.

Here's an example.

Nikon D4s | 18mm | f/16 | 1/3s | ISO 100 | 6250K | Hard GND 0.9 (3 stops) filter

Here's the final photo in which you can see how the filter position doesn't negatively affect the photo. The dark stripes have disappeared.

Nikon D4s | 18mm | f/16 | 1/3s | ISO 100 | 6250K | Hard GND 0.9 (3 stops) filter

One more thing...

Work fast

Light is the soul of photography, whether you're shooting with filters or not.

Light is the essential ingredient to capture a spectacular image. And in order to do that, you should be very careful when choosing the shooting time.

Using filters during a long exposure allows you to take photos at virtually any time of day. And if you don't believe me, I recommend you take a look at **the work of Julia Anna Gospodarou** (I'll tell you more about her in **section 21**).

But the vast majority of photographers, both beginners and experienced, generally use fil-

ters during dawn and dusk. In those moments of the day the light has a special color. Try taking pictures with filters during the **golden hour**, the **blue hour** and **twilights**, you'll see the difference compared to other times of the day.

The problem is that the perfect light doesn't last long...

And the amount of time you need to prepare your gear and shoot with filters, especially if it's a long exposure, is a bit longer than that of other types of photos...

So you have to try to get it right the first time!

And if it doesn't, get it right as soon as possible. Otherwise, by the time you realize it, that magic light will be gone.

Section 17:

21 examples using filters explained step by step

This is one of my favorite sections...

I love learning while looking at practical examples. And, above all, I love teaching other PhotoPillers like you to get results like these.

In this guide, I show you a lot of pictures I've taken with all kinds of filters. As always, I explain them step by step so you understand my workflow.

I hope you like the photos (and you learn a lot studying them) ;)

Color balance with GND filter (1)

Nikon D4s | 23mm | f/4 | 1/20s | ISO 100 | 6500K | Soft GND 0.9 (3 stops) filter

In this photo you can see one of my students during a photographic trip to Mallorca, more specifically in the area of Es Cap Blanc. He's practicing his composition while admiring the landscape.

When I saw the scene, I decided to compose taking the color balance into account. The orange color has a great visual weight here and I wanted to take advantage of it. So I chose to use it to compensate for the negative space created by a large part of the sky and the sea.

In addition, it was also a good counterbalance to the texture and ruggedness of the rocks in the foreground.

The light was changing very quickly and I didn't have time to mount the tripod, so I slided

the filter into the filter holder and shot with the image stabilization system (VR) of lens turned on.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead.
- GND filter: Soft GND 0.9 (3 stops) filter to reduce the dynamic range between the sky and the foreground and capture the scene in a single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it.
- Camera settings: Shoot in RAW. Turn on the image stabilization function if your lens has it. And if you're going to shoot handheld and at a slow shutter speed, as I did here.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture (between f/8 and f/16, although it could be larger if you focus at the hyperfocal distance) to get a deeper depth of field. Don't go over f/16 to avoid **diffraction**. Because I was handholding the camera I set a wide aperture as the light was fading away.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. Not in this particular case though, because I took a handheld picture and I turned on the lens VR to compensate for the relatively low shutter speed I set.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize the **depth of field**. Here f/4 was enough to have the whole scene focused.

- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Fog with GND filter (2)

Nikon D4s | 35mm | f/5.6 | 1/50s | ISO 400 | 6500K | Soft GND 0.9 (3 stops) filter without filter holder

This photo is the perfect example of an unexpected scene that you suddenly find and that disappears in the blink of an eye.

I was driving to the port of Alcudia (Mallorca, Spain) to take the ferry back home in Menorca (Spain). Suddenly, I came across this view. The fog was a diffuser of the dawn light and, at the same time, it hid the constructions behind the almond trees.

When I found a spot in the road where I could pull over, I got out of the car, took the camera without changing the lens and a GND filter. With hardly any time to think I focused, composed and shot.

I only had one chance... And I nailed it! :)

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape.
- GND filter: Soft GND 0.9 (3 stops) filter to reduce the dynamic range between the sky

and the foreground and capture the scene in a single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it.

- Camera settings: Shoot in RAW. Turn on the image stabilization function if your camera has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a fixed 35mm lens.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: Because I was handholding the camera I set a wide aperture. And since I didn't have a foreground, I was sure that all the elements of the image were in focus with a f/5.6 aperture.
- ISO: Use the lowest possible ISO. Here, I set an ISO 400 to shoot with a relatively slow shutter speed.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. In this situation, I had no doubt. I opened the diaphragm and cranked up the ISO to 400 to expose correctly and to have a shutter speed to shoot handholding the camera.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize the **depth of field**. The hyperfocal distance in this case was 7.25 m (you can calculate it with **the PhotoPills depth of field calculator**). So focusing at that distance and because I didn't have anything in the foreground I made sure that all the elements were in focus.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Sun in the frame with ND and GND filters (3)

Nikon D4s | 35mm | f/16 | 0,8s | ISO 100 | 7000K | ND 1.8 (6 stops) and soft GND 0.9 (3 stops) filters

While Eva was taking her photo, I noticed that the Sun was "moving" towards her body. So, when the time came, I asked her not to move.

I set the aperture to f/16 so I could create a sunburst and slided a soft GND filter to compensate for the highlights produced by the Sun.

I've never seen the Sierra de Tramontana so spectacular!

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead.
- ND filter: ND 1.8 (6 stops) filter to increase the exposure and get a slight movement in the low clouds. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it.
- GND filter: Soft GND 0.9 (3 stops) filter to reduce the dynamic range between the sky towards the horizon (brightest area) and the foreground, and capture the scene in a

single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it.

- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a medium focal length to enhance my main subject.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid **diffraction**. Here I went to the limit using f/16 to have everything in focus, from the main subject to infinity.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**. In this case I didn't want a very long shutter speed as I wanted to make sure Eva wasn't blurred in the shot.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field**. Although I got a hyperfocal of 2.59 m, I still got everything focused from Eva, who was at 4 m, to infinity using an aperture of f/16.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Sunrise with ND reverse GND filters (4)

Nikon D4s | 35mm | f/16 | 34s | ISO 100 | 7500K | ND 1.8 (6 stops), soft GND 0.9 (3 stops) and soft reverse GND 0.6 (2 stops) filters

The reverse GND filter is ideal for this type of photography. It helps you control the brightest area when it's close to the horizon. It's something you wouldn't fix with a regular GND filter because the density is soft in the center.

As you can see, for this **Sunrise**, I decided to stack the reverse GND filter with a low density GND filter (3 stops for this photo) and control the light on the top as well.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead.
- ND filter: ND 1.8 (6 stops) filter to increase the exposure and get a silky sea and a slight movement in the low clouds. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it.
- GND filter: Soft GND 0.9 (3 stops) filter to reduce the dynamic range between the sky towards the horizon (brightest area) and the foreground, and capture the scene in a single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it.
- Reverse GND filter: Soft reverse GND 0.6 (2 stops) filter to reduce the dynamic range between the sky area towards the horizon (brightest one) and the rest of the sky and

the foreground, so I can capture the scene in a single shot. In **section 10** you have everything you need to learn to expose with the reverse GND filter.

- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a fixed 35mm lens.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid **diffraction**. Here I went to the limit using f/16 to get a longer exposure time.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field**. Although I just had to focus on the nearest rocks as I didn't have anything in the foreground.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Clear sky with ND, GND and polarizer (5)

Nikon D4s | 18mm | f/11 | 40s | ISO 100 | 6250K | ND 1.8 (6 stops), soft GND 0.9 (3 stops) and polarizer filters

In this photo the polarizer is crucial: it eliminates the water reflections and allows the spectator to see the seabed.

I wanted a composition in which the lines of the rocks would lead the spectator's eye to Punta dels Frares (Menorca, Spain). When the foreground is so powerful, it's better to have a simple sky.

In addition to this, there were no dramatic clouds so nothing justified to include more sky in the frame. That's why I chose to put the horizon higher in the composition.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead.

- ND filter: ND 1.8 (6 stops) filter to increase the exposure and get a silky sea and a slight movement in the low clouds. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it.
- GND filter: Soft GND 0.9 (3 stops) filter to reduce the dynamic range between the sky towards the horizon (brightest area) and the foreground, and capture the scene in a single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it.
- Polarizer: Polarizing filter to eliminate the reflections of the rocks and to increase the transparency when eliminating the water reflections. Review **section 8** to learn how to use a polarizer.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a wide angle in a low position and framed vertically to include the rock detail and the water in the foreground.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid **diffraction**. Here I used f/11 because the foreground was very close to my camera.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.

- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field**. At f/11 I made sure I had the whole scene in focus, from the hyperfocal near limit that is at 0.49 m to infinity.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Create depth in the foreground with ND, GND and polarizing filters (6)

Nikon D4s | 18mm | f/11 | 14s | ISO 100 | 6250K | ND 1.8 (6 stops), soft GND 1.2 (4 stops) and polarizer filters

When you drop a glass filter during a photoshoot, it's something you don't easily forget... A few years later I still remember the moment when the ND 1.8 filter (6 stops) hit the rocks just after taking this picture of this idyllic area in the north of Menorca.

Here the use of the polarizer was key to enhance the depth in the foreground. At the same time, it also helped me to give more contrast to the greens of the marine vegetation that stand out at that time of year, as the sea level is lower than normal.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead.
- ND filter: ND 1.8 (6 stops) filter to increase the exposure and get a silky sea and a slight movement in the low clouds. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it.
- GND filter: Soft GND 0.9 (3 stops) filter to reduce the dynamic range between the sky and the foreground, and capture the scene in a single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it.
- Polarizer: Polarizing filter to eliminate the reflections of the foreground and create depth. Review **section 8** to learn how to use a polarizer.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a wide angle in a low position.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid diffraction. Here I used f/11 because the foreground was very close to my camera.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get

the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **diffraction**. Here I used f/11 because the foreground was very close to my camera.

- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field**. At f/11 I made sure I had the whole scene in focus, from the hyperfocal near limit that is at 0.50 m to infinity.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Seascape with ND, GND and polarizing filters (7)

Nikon D4s | 18mm | f/11 | 140s | ISO 100 | 6500K | ND 1.8 (6 stops), soft GND 0.9 (3 stops) and polarizer filters

That afternoon, the sunlight was casting a golden light on the rocky strip of Cabo de Cavallería (Menorca, Spain). So I had in front of me the perfect opportunity to play with a background that would help me compensate for the huge and visually powerful foreground.

I used a polarizer to eliminate as many reflections as possible in the natural pool of the foreground. At the same time, I used an ND 1.8 (6 stops) filter to enhance the movement of the water in the background. Finally, the light difference between the shadows and the sky was perfect to use a soft GND 0.9 (3 stops) filter.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead.

- ND filter: ND 1.8 (6 stops) filter to increase the exposure and get a silky sea and a silky sky. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it.
- GND filter: Soft GND 0.9 (3 stops) filter to reduce the dynamic range between the sky and the foreground, and capture the scene in a single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it.
- Polarizer: Polarizing filter to eliminate the reflections of the foreground and create depth. Review **section 8** to learn how to use a polarizer.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a wide angle lens and a vertical composition.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid **diffraction**. Here I used f/11 because the foreground was very close to my camera.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field**. At f/11 I made sure I had the whole scene in focus, from the hyperfocal near limit that is at 0.50 m to infinity.

- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Colors and motion with ND, GND and polarizing filters (8)

Nikon D4s | 28mm | f/5.6 | 3s (sky) and 49s (water) | ISO 400 | 6250K | ND 1.8 (6 stops), GND 1.2 soft (4 stops) and polarizer filters

Sometimes you're looking at a landscape with some amazing light and colors. Unfortunately, you're not able to capture in a picture what your eyes are seeing. I had an image in mind that included the movement of the waves hitting against the rocks and I also wanted to capture the detail and color of the clouds in front of me.

Since I couldn't get it in a single shot, I decided to take two identical photos changing the shutter speed and then merge the sensations in post-processing.

I edited both photos separately using **Lightroom**. Then, I blended them in **Photoshop**. It was simple because the horizon created a perfect border between the different planes.

Sometimes it's hard to convey the experience, but the result you see here is very close to what I imagined when I saw the scene.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead.
- ND filter: ND 1.8 (6 stops) filter to increase the exposure and get a silky sea. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it.
- GND filter: Soft GND 1.2 (4 stops) filter to reduce the dynamic range between the sky towards the horizon (brightest area) and the foreground, and capture the scene in a single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it.
- Polarizer: Polarizing filter to eliminate the reflections of the foreground and create depth. Review **section 8** to learn how to use a polarizer.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a wide angle lens and a vertical composition.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid **diffraction**. Here I used f/5.6 because the foreground was far away from my camera.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light

(brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**.

- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field**. At f/5.6 I made sure I had the whole scene in focus, from the hyperfocal near limit that is at 2.32 m to infinity.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Scenes when natural light changes rapidly with ND, GND and polarizing filters (9)

Nikon D4s | 22mm | f/5.6 | 827s | ISO 200 | 6250K | ND 4.8 (16 stops), soft GND 0.9 (3 stops) and polarizer filters

I was with a group of photographers from the association "Es Mussols de Llubí" on their photo trip around the island of Menorca (Spain) and we decided to explore this beautiful landscape located in the north of the island.

The **Sunset** was, photographically speaking, very flat: there were very few clouds and apparently no more clouds were going to show up.

Assuming that the sky was going to stay pretty much the same, I decided to use the ND 4.8 (16 stops) filter and risk taking a picture with an extremely long exposure time. That's 827 seconds, almost 14 minutes!

I also decided to slide a soft GND 0.9 (3 stops) filter to compensate for the strong light of

the Sun while it was setting.

When I pressed the shutter, the Sun was still above the horizon. When the camera stopped exposing almost 14 minutes later, the Sun had already set and disappeared from the sky. So this photo is the perfect example of a situation where you can't apply the **reciprocity law**.

In this case I had to adjust the exposure time taking into account how the light was fading out during the Sunset.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead.
- ND filter: ND 4.8 (16 stops) filter to increase the exposure and get a silky sea and a silky sky. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it.
- GND filter: Soft GND 0.9 (3 stops) filter to reduce the dynamic range between the sky and the foreground, and capture the scene in a single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it.
- Polarizer: Polarizing filter to eliminate the reflections of the foreground and create depth. Review **section 8** to learn how to use a polarizer.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a wide angle lens and a vertical composition.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid **diffraction**. Here I used f/5.6 to avoid having an even longer exposure.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO. Here, I cranked it up 1 stop (+1EV), from 100 to 200, to avoid having an even longer exposure.

- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field**. At f/5.6 I made sure I had the whole scene in focus, from the hyperfocal near limit that is at 1.44 m to infinity.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Flora with polarizer (10)

Nikon D500 | 200mm | f/7.1 | 1/400s | ISO 640 | 6250K | Polarizer filter

The polarizer can be useful in other situations than photographing landscapes.

In this case, I used it to reduce the reflections on the flowers of this tiny orchid (*Ophrys bombyliflora*) and to emphasize the colors of the early hours of the Sun.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead or, if you don't have one, a bean bag. I took this photo with this piece of gear, a bag of lentils, to balance the camera and avoid any shifting.
- Polarizer: Polarizing filter to eliminate the reflections of the foreground and create depth. Review **section 8** to learn how to use a polarizer.

- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: Here I decided to use a 200mm fixed focal macro lens to create a very shallow **depth of field** so the flower could stand out.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A medium aperture (between f/5.6 and f/8) to get the orchid tack sharp and have a blurred background behind the flower.
- ISO: Use the lowest possible ISO. Here, you may need to increase it as I did, to keep a relatively short shutter speed due to the breeze that was blowing.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. In this shot it was crucial to use a short shutter speed to freeze the flower and avoid any motion blur because of the light breeze that was blowing.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: In this case, after thoroughly examining the plant to find a point where the flowers were at approximately the same distance from each other and on the same focal plane, I focused on the labellum of one of them. An aperture of f/7.1 allowed me to have the whole flower sharp.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Fauna with polarizer (11)

Nikon D300s | 500mm | f/5.6 | 1/2000s | ISO 400 | 5650K | 49mm Circular polarizer filter on the back on the lens

I took this picture on a cold January morning. I went to do a photo shoot in the wetlands so I mounted the 500mm lens.

Moreover, to take advantage of and enhance the reflections of the birds in the first hours of the morning, I always put the polarizer in the back of the telephoto lens. It's the only way to polarize the light.

With a telephoto so big (123mm diameter), it's impossible to place a filter holder and use a standard rectangular filter. Even the largest one (165mm) doesn't cover the entire front glass.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead or, if you don't have one, a bean bag.

- Polarizer: Polarizing filter to enhance the reflections of the birds in the water. Review **section 8** to learn how to use a polarizer.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of wildlife photography you're going to do. From a 200mm if you're close and in a hide to a focal of 600mm or more.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). Here, I metered in the white area of the black-winged stilts' lower feathers (*Himantopus himantopus*). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A medium aperture (f/5.6) to get both birds tack sharp.
- ISO: In wildlife photography, always take this setting into account when shooting handheld. Select the ISO that gives an image with the best possible quality. That is, the one with less noise.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much **depth of field**, movement or light (brightness) you want in the photo. In this shot, a shutter speed of 1/2000s allowed me to freeze the birds.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus on the eyes of the bird. It's first the spectator will look at.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Abstract with ND filter (12)

Nikon D700 | 500mm | f/4.8 | 1/6s | ISO 400 | 5700K | 49mm circular ND 0.9 (3 stops) filter on the back of the lens

I was waiting for thousands of starlings to return to their nest. This is where they make their characteristic and spectacular flights before settling down.

Suddenly, it occurred to me to take some pictures of the reeds. I took advantage of the ND 0.9 (3 stops) to have a longer exposure. At the same time, I made a series of circular movements with the camera.

And this was the result ;)

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape or a telezoom if you want to compress distant elements, an intervalometer and a sturdy tripod with a ballhead.
- ND filter: ND 0.9 (3 stops) filter to increase the exposure and get a circular pattern in the shot. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it. Although in this case, because it was only subtracting 3 stops, I

was able to meter with the filter already placed in the back of the lens.

- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a telezoom lens.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid **diffraction**. Here I used f/4.8 as it was more than enough to have a longer exposure and move the camera at the same time.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field** or in scenes like this one, focus on the vegetation.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Moving camera with ND filter (13)

Nikon D700 | 21mm | f/16 | 1.5s | ISO 200 | 7200K | ND 0.9 (3 stops) filter

Another use of ND filters is to create images conveying motion on a scene illuminated by sunlight.

To get this image I screwed on an ND 0.9 filter (3 stops). Thus, I managed to reduce the shutter speed to 1.5s. At the same time, I moved the camera in spite of having it mounted on the tripod.

All this helped me to get this surreal image.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape or a telezoom if you want to compress distant elements, an intervalometer and a sturdy tripod with a ballhead.
- ND filter: ND 0.9 (3 stops) filter to increase the exposure and get some motion and blur in the shot. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a wide angle lens.

- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid **diffraction**. Here I used f/16 to have a longer exposure and move the camera at the same time.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field**.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Ethereal atmosphere (no clouds or wind) with ND filter, GND in motion and polarizer (14)

Nikon D4s | 22mm | f/8 | 100s | ISO 100 | 6250K | ND 3.0 (10 stops), soft reverse GND 0.6 (2 stops) in motion and polarizer filters

I worked a lot on the composition trying to avoid an overlap between the different planes. That's how I managed to isolate the main subject and crop the frame on the left while including Cabo de Cavallería (Menorca, Spain).

Due to the small waves and the absence of clouds, I decided to increase the exposure time to more than a minute and a half to convey a relaxing atmosphere thanks to a calm sea contrasting with the rocks.

With this composition the subject stood out above the horizon. So I put in a reverse GND filter to control the **Sunset** highlights (upper left corner) and I moved it carefully during the exposure. That way I could eliminate the filter transition from the picture and avoid a potential dark band.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a

broad landscape, an intervalometer and a sturdy tripod with a ballhead.

- ND filter: ND 3.0 (10 stops) filter to increase the exposure and get a silky sea. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it.
- Reverse GND filter: Soft reverse GND 0.6 (2 stops) filter to reduce the dynamic range between the sky towards the horizon (brightest area) and the foreground, and capture the scene in a single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it. Moreover, I moved the reverse GND filter during the exposure to avoid dark areas in the final image. Learn how move the filters during the exposure in **section 15**.
- Polarizer: Polarizing filter to eliminate the reflections of the foreground and create depth. Review **section 8** to learn how to use a polarizer.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Using a focal length of 22mm, I managed to remove from the frame some white rocks that ruined the composition.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid **diffraction**. Here I didn't want to have a shutter speed slower than two minutes, so I used f/8 to have everything in focus.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**. Here I used an even slower shutter speed because the Sun was already low and the light was constantly changing.

- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field**. At f/8 I made sure I had the whole scene in focus.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Human element in the landscape with ND and reverse GND in motion (15)

Nikon D4s | 18mm | f/16 | 6s | ISO 100 | 6500K | ND 1.8 (6 stops) filters and soft reverse GND 0.6 (2 stops) filter in motion

While a student was doing composition exercises at a wharf in Formentera (Spain) I quickly visualized **a tribute to Friedrich**.

Using the woods as guiding lines, I centered the composition around the lonely photographer. Thanks to the ND 1.8 (6 stops) filter I was able to shoot at a shutter speed of 6s. That was more than enough to create the atmosphere I wanted: movement in the clouds and a silky water that turned the sea into a soft element...

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead.
- ND filter: ND 1.8 (6 stops) filter to increase the exposure and get a silky sea and a silky sky. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it.
- Reverse GND filter: Soft reverse GND 0.6 (2 stops) filter to reduce the dynamic range between the sky towards the horizon (brightest area) and the foreground, and capture the scene in a single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it. Moreover, I moved the reverse GND filter during the exposure to avoid dark areas in the final image. Learn how to move the filters during the exposure in **section 15**.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Using a wide angle lens, I managed to use the woods as guiding lines to the main subject of the picture.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid **diffraction**. Here I used f/16 to focus as close as possible in the scene.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow

shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**. Here I didn't want to use a very slower shutter speed to avoid having my subject out of focus.

- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field**. At f/16 I made sure I had the whole scene in focus.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Reverse GND in motion with ND and polarizer (16)

Nikon D4s | 18mm | f/11 | 80s | ISO 100 | 6500K | ND 3.0 (10 stops), soft reverse GND 0.6 (2 stops) in motion and polarizer filters

This is another example where the polarizer is perfect to remove the reflections of the wet rocks in the foreground and to enhance their golden color.

In addition, I moved the reverse GND filter during the exposure, putting it first below the skyline and raising it carefully to avoid any dark areas in the final image.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead.
- ND filter: ND 3.0 (10 stops) filter to increase the exposure and get a silky sea and a silky sky. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it.
- Reverse GND filter: Soft reverse GND 0.6 (2 stops) filter to reduce the dynamic range between the sky towards the horizon (brightest area) and the foreground, and capture the scene in a single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it. Moreover, I moved the reverse GND filter during the exposure to avoid dark areas in the final image. Learn how to move the filters during the exposure in **section 15**.
- Polarizer: Polarizing filter to eliminate the reflections of the wet rocks in the foreground and enhance their color. Review **section 8** to learn how to use a polarizer.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a wide angle 18mm lens in a low position.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid **diffraction**. Here f/11 was enough.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.

- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light (brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field**. At f/11 I made sure I had the whole scene in focus, from the rocks in the foreground to infinity.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Reverse GND in motion with ND, GND and polarizer (17)

Nikon D4s | 20mm | f/16 | 20s | ISO 100 | 5500K | ND 1.8 (6 stops), hard GND 0.9 (3 stops), soft reverse GND 0.6 (2 stops) in motion and polarizer filters

I wanted to include the Sun in the composition, so I had to use two GND filters.

Fortunately, having a clean, unobstructed horizon allowed me to add the densities of a strategically placed hard GND filter on the horizon line and a reverse GND filter. This way I made sure that the area around the Sun (highlights) wasn't blown out (overexposed).

In addition to this, I moved the reverse GND filter during the exposure to avoid any dark areas in the final image.

Finally, I used the polarizer to eliminate water reflections on the rocks in the foreground.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter), a wide angle lens if you want a broad landscape, an intervalometer and a sturdy tripod with a ballhead.
- ND filter: ND 1.8 (6 stops) filter to increase the exposure and get a silky sea and a silky sky. Take a look at **section 9** to learn how to choose the ND filter you need and how to expose with it.
- GND filter: Hard GND 0.9 (3 stops) filter to reduce the dynamic range between the sky towards the horizon (brightest area) and the foreground, and capture the scene in a single shot. See **section 10** to learn how to choose the GND filter you need and how to expose with it.
- Reverse GND filter: Soft reverse GND 0.6 (2 stops) filter to reduce the dynamic range between the sky area towards the horizon (brightest one) and the rest of the sky and the foreground, so I can capture the scene in a single shot. In **section 10** you have everything you need to learn to expose with the reverse GND filter. Moreover, I moved the reverse GND filter during the exposure to avoid dark areas in the final image. Learn how to move the filters during the exposure in **section 15**.
- Polarizer: Polarizing filter to eliminate the reflections of the wet rocks in the foreground. Review **section 8** to learn how to use a polarizer.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a wide angle lens at a focal length of 20mm.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper depth of field. Be careful not going over f/16 to avoid **diffraction**. I used f/16 because the rocks in the foreground were too close. I wanted the whole image focused without having to do a focus stacking.
- ISO: You'll always use a tripod to shoot long exposure landscapes. Use the lowest possible ISO.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much depth of field, movement or light

(brightness) you want in the photo. Although, in general, I recommend you to use slow shutter speeds. When using an ND filter, first take a test shot without the filter to get the exposure you want. Then, calculate the equivalent shutter speed you need when using the filter with the **PhotoPills long exposure calculator**.

- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: Focus at the **hyperfocal distance** to maximize **depth of field**. At f/16 I made sure I had the whole scene in focus, from the rocks in the foreground to infinity.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Drone with polarized ND filter (18)

DJI Mavic Pro drone | 26mm | f/2.2 | 1/160s | ISO 100 | 6250K | Polarized ND 0.9 (3 stops) filter

Well, yes...

Who said filters can't be used in **aerial photography when shooting with a drone**?

In this case I used a **special filter for drones**, more specifically an ND 0.9 (3 stops) filter that is also a polarizer.

To sum up, the steps you should follow to take the photo are:

- Gear: Drone camera with a 26mm fixed lens.
- ND filter: Polarized ND 1.8 (6 stops) to shoot in very bright light conditions.
- Polarizer: In this example the ND filter is also a polarizer. Besides being able to subtract light in very sunny scenes, I use it to eliminate reflections in the sea.
- Camera settings: Shoot in RAW.
- Focal length: Almost all drones have a camera with a fixed focal length. The focal length here is 26mm.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you're going to use it, meter with the polarizer mounted and once you've rotated it to get the effect you want. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**. When I take photos with my drone I often use the **bracketing** technique to make sure my image has the right dynamic range.
- Aperture: Most drones have a camera with a fixed aperture, so you can't change this setting. My drone has a fixed aperture of f/2.2.
- ISO: Use the lowest possible ISO. Drone cameras produce a lot of noise compared to regular ones.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much **depth of field**, movement or light (brightness) you want in the photo.
- White Balance: Manual. It depends on the time of day and the quality of the **natural light**. Nevertheless, you can always correct it in post-processing.
- Where to focus: In the area you want to be in focus. Taking into account the fixed aperture of f/2.2, the **hyperfocal distance** is usually about 2 m. Keep the drone at that distance and your images will always be tack sharp.

- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Portrait with circular green filter (film) (19)

Nikon FM2n | 85mm | f/1.4 | 1/500s | ASA 800 pushed to 1600 | Green filter to soften the skin tones | Kodak Tri X-400 film

One of my commitments when I started working in digital was not abandoning analog photography. I enjoyed it so much... and I still do!

Thanks to a green filter I could remove reds and blues, while letting greens and yellows go through the lens. That way the skin would have a more natural tone.

To sum up, the steps you should follow to take the photo are:

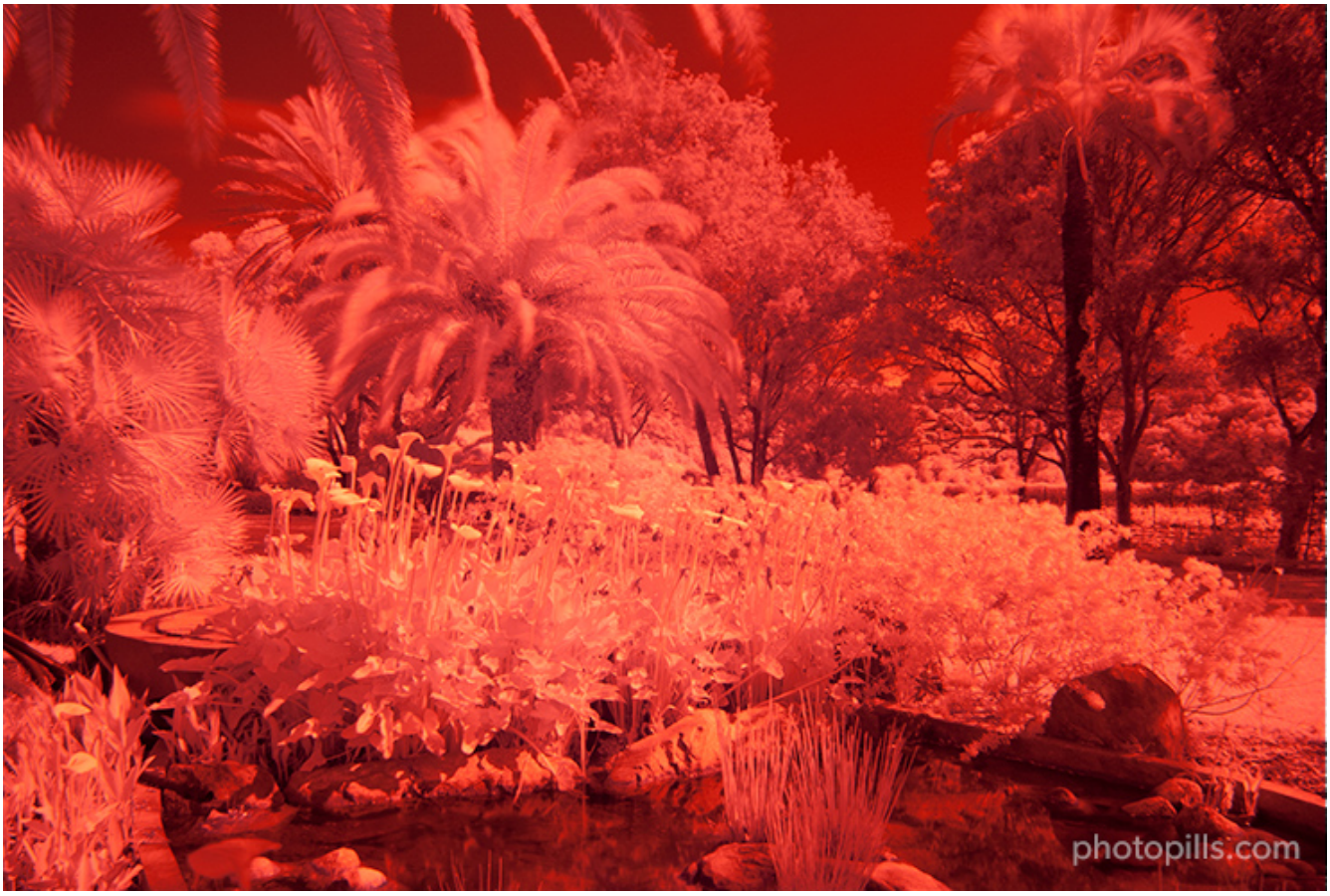
- Gear: Analog camera, a lens (the focal range varies depending on what you want to include in the frame).
- Green filter: A black and white filter used to correct and modify tones in monochrome photography. The green filter helped me soften Jan's skin tone.

- Camera settings: Kodak Tri X-400 film, ideal for portraits as it gives a quality grain.
- Focal length: In this type of portrait, a medium fast telephoto lens is ideal.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode on the kid's face.
- Aperture: A wide aperture to get a nice bokeh.
- ASA: This film allows some creative options such as pushing the sensitivity to 1600 ASA, producing a spectacular grain.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much **depth of field**, movement or light (brightness) you want in the photo.
- Where to focus: Focus on the model's eyes to capture the spectator's attention. Be careful when focusing with such a fast telephoto lens.
- Take the picture. In analogue photography, you can't chimp on your LCD. You can only check the image after you've developed the film. It's the magic of traditional photography.

Infrared with external filter (20)

Nikon D200 | 27mm | f/9 | 55s | ISO 200 | 5600K | Hoya R72 (720 nm) filter

The black and white photo you see is the final image, after post-processing, while the image you have just below is the RAW file. That is, what the camera captured with the infrared filter (a **Hoya R72**) screwed on.



Nikon D200 | 27mm | f/9 | 55s | ISO 200 | 5600K | Hoya R72 (720 nm) filter

Infrared photography produces impressive and creative results.

The elements of any scene reflect infrared light in a very different way than normal light.

In this case, and after post-processing, all the vegetation chlorophyll is transformed into a ghostly white color....

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (full frame is best), a lens (the focal range varies depending on what you want to include in the frame), an intervalometer and a sturdy tripod with a ballhead.
- Filters: **Hoya R72** filter, a special filter for infrared photography with digital cameras.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a wide angle lens where I could screw on the filter and a focal length of 27mm.

- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. Meter the brightest area of the scene you want in detail and overexpose by 1 or 2 stops (+1EV or +2EV). If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: A small aperture to get a deeper **depth of field**.
- ISO: Use the lowest possible ISO to avoid noise.
- Shutter speed: You have to take a first test shot without the filter until you get the exposure you want. Then, take a second test shot with the filter on. To calculate the exposure time you need to get the correct exposure, use the **PhotoPills long exposure calculator**. You have a detailed explanation with all the steps you have to follow in **section 13**.
- White Balance: Whenever I use this filter, I use the auto white balance option. Then, I adjust in post-processing.
- Where to focus: I focused on the plants in the foreground. Since I was using a large aperture, I was able to have the whole scene perfectly focused.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Infrared with internal infrared filter (21)

Nikon D300 IR | 35mm | f/8 | 1/300s | ISO 200 | 2150K | Internal infrared filter

Okay, I admit it.

I love infrared photography. I can't help it.

I love the fantastic results it produces. For example, the brutal contrast in the sky when there are clouds or between the grass and a very dark sky. I also love the lack of detail in the skin of people and animals.

But above all, I love being able to capture a kind of light that is completely invisible to the human eye. I can create truly magical and unusual images.

To sum up, the steps you should follow to take the photo are:

- Gear: Modified infrared camera (the type of sensor doesn't really matter), a lens (the focal range varies depending on what you want to include in the frame)
- Filters: Internal infrared filter, installed on the sensor.
- Camera settings: Shoot in RAW.
- Focal length: It depends on the type of landscape you want to do. You can use from a short focal length (10mm, 14mm, 24mm, etc.) to cover as much landscape and sky as possible to a telephoto or super telephoto lens. Here I used a fixed 35mm wide angle lens.
- Exposure mode: Manual (M).
- Metering mode: Spot metering mode. If you have doubts on how to expose, follow the steps indicated in **section 11**.
- Aperture: Use a suitable aperture, depending on the scene you want to capture. Be careful not going over f/16 to avoid **diffraction**.
- ISO: Use the lowest possible ISO to avoid noise.
- Shutter speed: Since you're shooting in Manual mode (M), the shutter speed is determined by the aperture, ISO and filters combination you select. Here, your personal style comes into play depending on how much **depth of field**, movement or light (brightness) you want in the photo. Although, generally, I recommend using slow shutter speeds. The internal infrared filter doesn't subtract light at all, so this modified camera works very much like a regular one.
- White Balance: Manual. Since the filter has an infrared spectrum of about 720 nm, the resulting image is completely red, as you can see in the example. So I recommend you to set the white balance manually. Here, I set it to 2150K so that the preview on the LCD screen was brownish instead of bright red and I was able to see the details more accurately. After that, you can correct it in post-processing.

- Where to focus: I focused on the head of the cow that was closer to me.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Partial eclipse with solar filter (22) *[bonus track]*

Nikon D500 | 500mm | f/8 | 1/250s | ISO 100 | 6450K | Solar Baader filter

During the partial eclipse phase the Moon covers part of the Sun's surface. For this type of photography I like to use my telephoto lens with a solar filter to focus all my attention on the Sun, and capture how it disappears behind the Moon.

To sum up, the steps you should follow to take the photo are:

- Gear: Camera (the type of sensor doesn't really matter, although I recommend you an APS-C or Micro 4/3 sensor, because of the larger effective focal length you'll get), a

telephoto lens so the Sun takes most of the frame, an intervalometer, a sturdy tripod and a ballhead. In this case I also used a gimbal to have more stability.

- Solar filter: Baader solar filter, specially designed to observe and photograph the solar surface. The model I use subtracts around 16.6 stops.
- Camera settings: Shoot in RAW. Turn off the image stabilization function if your lens has it.
- Focal length: Long focal length (300mm, 450mm, 600mm, etc.) to cover the area of the sky where the Sun and Moon are so they take most of the frame.
- Metering mode: Spot metering mode. Meter on the Sun before the eclipse begins.
- Aperture: Use a relatively narrow aperture so the celestial bodies are perfectly in focus. Since this picture is a close-up, **depth of field** isn't critical. In this case I shot at f/8 to get the maximum detail of the partial eclipse.
- ISO: You'll always use a tripod to shoot solar eclipses. Use the lowest possible ISO.
- Shutter speed: Taking into account the metering on the Sun, the aperture and the ISO, adjust the shutter speed so the light meter is centered at zero (correctly exposed). During the partial eclipse I used a shutter speed base of 1/250s.
- Bracketing: To make sure you're getting at least one photo correctly exposed, bracket your exposure starting with a base shutter speed of 1/250s. For this photo I used a 3-stop exposure **bracketing**.
- White balance: Manual. Nevertheless, you can always correct it in post-processing. In this photo I used a warm white balance (6450K) to capture the colors of the Sun through the Baader solar filter, which produces a neutral dominant (white).
- Where to focus: The first thing you have to do is put the solar filter on your lens (this is essential if you don't want the Sun to scorch the sensor!). Before the eclipse starts, focus on the edge of the Sun. Use the Live View option on your camera's LCD screen to make sure the Sun is perfectly focused. And if your camera has the Focus Peaking and/or Focus Magnifier options, turn them on to get an even more accurate focus.
- Take the picture and check that everything is focused. Make sure the photo is correctly exposed (check the **histogram**). Otherwise, adjust the exposure accordingly.

Section 18:

Exposure stacking vs using ND filters

Throughout this article we've seen that an ND filter allows you to increase the exposure time to create spectacular effects....

Well, when I explain the use of ND filters in my workshops, I always get the same question...

"Toni, why do I need an ND filter? I can get the same effect by stacking shots with a shorter shutter speed."

And I always answer the same thing.

Whenever possible, I'd rather use an ND filter and have the photo "almost" finished straight on camera. Call me romantic, but I like to face the scene and capture it with the tools I have instead of depending too much on the computer.

Having said that, if I forget the filters at home (or I break one of them), I do take several exposures and then stack them in post-processing.

Sometimes I capture certain scenes by shooting multiple exposures, always using an ND filter in each of them, and then stack them at home. These images require a very long exposure time that could generate a lot of noise. To avoid this, I combine the use of filters with the exposure stacking technique and so I control the potential noise.

So, I think it's interesting to delve into the exposure stacking technique, its advantages and drawbacks compared to ND filters and how you can get the most out of combining both techniques...

Keep reading!

What is exposure stacking in post-processing

First, you have to take several pictures. They don't have to have a certain shutter speed.

At home, load all the shots onto a post-processing software (**Photoshop**, for example) and stack them.

The resulting image is the equivalent of a long exposure photo with a total exposure time equal (or almost equal) to the sum of each individual shot.

That's why, when I told you that each shot doesn't have to have a specific exposure time, you can decide between two options:

- Take a lot of long exposure shots (imagine you take 12 photos) with a relatively short shutter speed (10 seconds for example).

- Take a few long exposure shots (let's suppose you take 4 photos) with a relatively long shutter speed (30 seconds for example).

As you can see, after stacking them you get in both cases an image with an exposure time of 120 seconds. But you haven't captured it exactly the same way.

The way you capture it is really up to you. There is no single formula or way to do it.

Basically, this technique allows you to get a very similar result to what you would get if you had taken a single 120-second shot.

If you want to learn how to stack several long exposures, I suggest you take a look at this two videos:

- **Landscape Astrophotography Noise Reduction with Image Stacking in Photoshop CC or CS6 Extended**.
- **Milky Way Exposure Stacking with Manual Alignment (Noise Reduction) in Adobe Photoshop**.

You can also do the whole process straight on camera.

Some cameras have a function called multiexposure that stacks your pictures directly without using your computer.

Imagine you take 10 photos of 30 seconds each with an ND filter. Once you've captured the last shot, your camera stacks them. The result is a 300-second photo that has a noise very similar to that of a 30-second photo taken with a higher-density ND filter.

Advantages and drawbacks of stacking exposures

Like any other photography technique, stacking exposures has its advantages and inconveniences over using an ND filter.

Its advantages are:

- You can increase the exposure time as much as you want... Don't be afraid of noise.
- You have a lot of flexibility to determine the intensity of the effect you get thanks to that very long exposure (movement, silk effect, blur, etc.). In astrophotography, when shooting the **Milky Way** or **Star Trails**, for example, stacking exposure gives you much more control. You can align precisely the exposures to avoid the Earth's rotation effect. You can also reduce the noise your sensor produces (when working for a longer time) and avoid **hot pixels**.

- You aren't going to use an ND filter to take pictures. Or if you do, it will have a low density. Therefore, each image will have much less vignetting (dark corners in the frame).
- You reduce shooting risks (tripod shifting, light changing suddenly, etc.).
- If you forget your ND filter(s) at home, stacking can be a good solution.

And now, let's look at the drawbacks:

- There are certain effects that you can't replicate in post-processing, such as conveying motion by taking a longer single exposure (with a higher density ND filter).
- Stacking exposures forces you to spend time post-processing in front of the computer.
- At the end of the photo shoot, you'll end up with a lot of 20, 24, 50MB (depending on your camera) RAW files instead of a single RAW. Obviously, after stacking them the final image will have much bigger size.

Don't choose: combine both techniques if necessary

As I always say, in photography you set the limits.

Think out of the box and try different ways of shooting. And in this case, don't force yourself to choose one technique or another. Depending on the situation you're in, combining both (use an ND filter and then stack the shots) can give you just the result you're looking for.

Here are some cases when combining both techniques may be the best solution:

1. You want a photo with a very long the exposure time and you don't have enough ND filters to get it.
2. Your camera produces a lot of noise and you want to limit it as much as possible.
3. You're not sure how long you want the exposure to be. Thanks to the stacking exposures technique you can extend the exposure time as much as you want. That is, you can add or subtract shots until you get the photo you want.
4. You're in a location with terrible weather conditions (rain, wind, cold, snow, blizzard,...). Using both techniques you spend less time outdoors and avoid risks during the shooting. Or you may even not be able to take any pictures at all!

5. You want to avoid missing the moment you were waiting for or a special light that lasts a very short time, or even ruin the shooting session because you find yourself in a very changing light situation. Imagine, for example, a dawn in winter with some clouds and a strong wind.

These are just a few examples. You may face many different situations.

As I was saying, the most important thing is to be flexible and use all the tools and techniques you have and know to adapt to any situation and get the photo you dream of.

Section 19:

Bracketing vs using GND filters

In **section 2** you learnt what a GND filter is and how you can photograph scenes with a high **dynamic range**.

And in **section 10** you learnt how to expose your images using with one or several GND filters.

But the use of GND filters is not the only way to capture a scene with a high dynamic range. You can also use a bracketing.

What is the bracketing technique?

To use the **bracketing** technique you should first take a few shots with different exposures.

You then blend them with a post-processing software (**Lightroom**, **Photoshop**, etc.) to get a picture with detail on both the shadows and the highlights.

In other words, with a bracketing you can produce a high dynamic range (HDR) image where the dynamic range of the scene fits.

Advantages and drawbacks of bracketing

Like any other photography technique, bracketing has its advantages and disadvantages compared to using a GND filter.

Its advantages are:

- You don't need to carry extra equipment (filters, filter holders and rings) so you save space, weight and money.
- Since you're not using a GND filter, you can easily photograph scenes where dark and light tones are not separated by a straight line. So you avoid having dark areas in the photo because of the filter.
- The quality of the image remains intact because you're not adding any element between the scene and the lens.
- It's a technique that allows you to work faster. You don't have to choose filters, nor do calculations to find out equivalent settings (**section 10**), nor place them accurately.

And now, let's look at the drawbacks:

- By blending the photos automatically, you'll surely get an image that lacks contrast, with very bright shadows. So you need to correct the contrast in post-processing.

- Each shot must be identical to the others (except for the exposure) so all the elements of your scene must be static.
- You have to spend time in front of the computer to blend the shots and get the result you're looking for. Depending on the image, **you may have to learn how to use luminosity masks**.
- At the end of the photo shoot, you'll end up with a lot of 20, 24, 50MB (depending on your camera) RAW files instead of a single RAW.

Don't choose: combine both techniques if necessary

As I told you at the end of **section 18**, use all the tools and techniques you have and know to get the photo you dream of.

Because that's what it's all about, isn't it?

I'll give you some cases in which the combination of both techniques can be the best solution:

1. Although **PhotoPills** helps you with all the calculations and the results are accurate, if you're learning to use GND filters or you're facing a scene with a very high dynamic range, a bracketing ensures you have the whole scene perfectly exposed. It can be a safety net.
2. You're in front of a scene where the water is moving. If you only use a bracketing, you'll hardly get two or several identical shots (except for their exposure, of course). The water will never come out the same. But if you use a GND filter you can get a silky water. This way, the shots will be identical and you won't have any problems blending them.

Section 20:

12 errors that you should avoid when shooting with filters

Oscar Wilde said that *"experience is the name that everyone gives to their mistakes"*.

So...

Make mistakes! Become a more experienced photographer!

But make sure you learn from them. Because if you keep making the same mistakes over and over again, you won't progress and you'll be terribly frustrated.

And I'm sure you don't want this.

So here's a list of the most common mistakes you can make when shooting with filters.

You don't test (and calibrate) your filters at home (1)

When you buy a 3, 6 or 10-stop ND filter, for example, you'll probably assume that your filter has the exact optical density to subtract light by 3, 6 or 10 stops.

Well, you shouldn't.

In practice, manufacturers are not entirely accurate. It's been ages since I started using filters (yes, ages, trust me) and I've never bought a filter with the exact density the manufacturer labels.

As you can imagine, the difference is usually small but even if it's only a third of a stop, this will affect the shutter speed you need to get the exposure you want.

So in order to avoid mistakes that you won't be able to correct in post-processing, I suggest you test and calibrate all your filters beforehand (**section 3**).

You don't take into account the Sun in your composition (2)

Plan your picture!

And above all, anticipate the position where the Sun will be, taking into account the direction in which you're going to frame and shoot. To do this, use **PhotoPills** ;)

If you're going to do a very long exposure (several minutes), avoid including the Sun in the frame. Keep in mind that the Sun "moves" much faster than it seems. And if the Sun is in your frame, after a couple of minutes its position will have changed significantly in the composition.

You leave the stabilization system turned on (3)

Most camera and lens manufacturers offer a stabilization system that reduces the risk of getting blurred pictures when you're shooting in low light conditions and at a slow shutter speed.

This tool can be integrated in the lens (Nikon and Canon, for example) or in the body (Sony, Fuji, Olympus, Panasonic, Pentax, for example).

It's basically a series of motion sensors that detect any vibration that occurs and try to correct it.

If you're shooting with filters, you'll surely have your camera mounted on your tripod (if you haven't forgotten it at home). Use a study tripod to prevent any vibration or movement.

The problem is that if you leave the stabilization function turned on, your camera can assume at any time that there was a vibration (although there wasn't). And it could have the opposite effect: create a slight movement that will blur the photo.

So turn off the stabilization function of your camera or lens as a precaution. It may not happen if you leave it turned on. But just in case, I always turn it off.

You don't cover the viewfinder (4)

Nikon D4s | 22mm | f/9 | 120s | ISO 100 | 9100K | ND 1.8 (6 stops) and soft reverse GND 0.6 (2 stops) filters

Light is a tremendously powerful element that manages to slip through any crack unless you put all your effort into avoiding it. And now you know that when you're shooting with filters, controlling the amount of light that reaches the sensor is crucial to get a properly exposed photo.

The filter allows you to control the light that enters through the lens. But there are other nooks and crannies through which light can get through. And the easiest one is... You've guessed it: your camera's viewfinder.

So the best thing you can do is cover it up as soon as you've finished working on your composition.

How?

Very easy.

Many high-end cameras have a lid that you can easily open and close or a small plastic piece that you can slide over the viewfinder. But if that's not your case, you can use almost anything: a piece of gaffer's tape, a cloth (the same one you use to clean your lenses), a bit of play dough or even a piece of gum! XD

If you don't cover it completely, you'll probably get halos and faded purple lines in your photo.

Moreover, if you use a filter holder, the light can also slip between one filter and another. In that case, the best thing you can do is cover those gaps with a piece of gaffer's tape.

Note: *If you have a mirrorless camera, you won't make this mistake* ;)

You use a f/22 aperture to slow the shutter speed (5)

It's **one of the basic rules of photography**: if you close the aperture to f/22, you slow the shutter speed. That is, you increase the exposure time.

So, if you shoot at f/11 for 30 seconds and change the aperture to f/22, you'll have to shoot for 2 minutes to keep the same exposure (same **histogram**).

And it actually makes sense. In theory...

In practice, an optical phenomenon known as **diffraction** usually occurs from f/16 onwards. In short, your image is not sharp anymore and certain parts may be blurred.

So, if you're shooting at f/11 and need a slower shutter speed, I suggest you two options: either lower the ISO or use filters (or a darker filter than the one you're using)!

You forget to adjust the ISO (6)

You're super excited with what you're witnessing. And you can't help but be nervous as well. You want everything to be perfect because you know you don't have a lot of chances...

And of course, between working the composition, placing the filters and choosing the settings, you forget that you can play with the ISO!

The ISO can help you a lot to successfully get your shot.

When using the autofocus, you forget to change it to manual after focusing! (7)

It's very important to focus before placing the ND filter in front of the lens. Considering the opacity of an ND filter, it'll be very difficult for your camera to focus.

And since we're talking about focusing, don't forget to change the focus to manual once you've used the autofocus and your photo is perfectly sharp.

If you forget to change it, you risk half pressing the shutter release button (if you don't use the back button focus)... The camera will try to refocus and may change the focus point. So part or the whole photo will be blurred.

And believe me, when you wake up at 4:30 am to shoot a Sunrise and you get soaked because of the wind and rain, the last thing you want to do when you get home is to check that your photos aren't sharp...

If you use the back button focus, don't press it again. That will do it ;)

You don't trust the histogram (8)

Why?

You should never use the image on your LCD screen to set the exposure you're looking for. And this is for two reasons:

- Your camera's LCD screen is very bright and that distorts how you assess your exposure.
- In addition to this, the image shown on the LCD screen is not a RAW file, it's a JPG that the camera has produced after applying a series of adjustments. It's not a neutral image.

So always (always) use the **histogram** to check your shot's exposure. Thanks to the information provided by the histogram you can quickly determine if you have adjusted the shutter speed correctly. Or if you need to make any other adjustment (either the shutter speed or any other setting).

You don't follow the right order when putting the filters (9)

You may need to use more than one filter at a time to get the photo you want.

In fact, most filter holders let you insert up to a maximum of 4 filters. But the question is, in what order do you have to place them?

Actually we have to differentiate between the order of insertion of the filters and their final position or order of position.

On the one hand, you have the **order of insertion**. That is, the order in which you insert each of the different filters: first the polarizer, then the GND filter and finally the ND filter.

On the other hand, you have the **order of position**. In other words, the order in which the filters are placed with respect to the sensor.

The polarizer can be in the position nearest or furthest from the sensor depending on the system you use. The ND filter should be as close to the sensor as possible. Finally, the GND filter is the one furthest from the sensor, ahead of the ND filter.

If you use more than one ND filter, always place the darkest filter closest to the sensor. The same applies if you use more than one GND filter.

If you don't follow this order, you may ge black bands in certain areas of the photo or may end up with **diffraction** in the brighter parts of the photo. In addition to this, some light may enter through the cracks in the filter holder, ruining the exposure.

Note: *Don't worry about the order if you use screw-on filters*.

You don't use an intervalometer or remote shutter release (10)

Any camera is incredibly sensitive to the slightest movement and vibration. If, on top of it, (i) you're using a slower shutter speed (because of the filters), (ii) the camera is on a tripod in a definitely unstable terrain and (iii) it may be windy at the location... You have the perfect ingredients to have a blurred photo.

Using a remote shutter release prevents you from touching the camera. But I suggest you go one step further and use an intervalometer. It has the same advantages as a remote shutter release and you can also program it so that the shutter is open for as long as you need (Bulb mode) without having to constantly watch your clock.

If you use a remote shutter release, take advantage of the **PhotoPills Timer** to know when the exposure is over. You'll find the Timer both at the end of the Pills menu and in the **Exposure** and **Time lapse** pills.

A little reminder. When you're using the Bulb mode, once you press the shutter button, the camera keeps the shutter open as long as you want (seconds, minutes...) and doesn't close it until you stop pressing it.

Imagine pressing the shutter button with your finger for 2 minutes and 45 seconds! No way! And you'll risk shaking the camera.

So use an intervalometer (or a remote shutter release). You'll thank me... ;)

You don't take into account the wind speed (11)

Ah! The wind... What would us photographers do without it in our long exposures?

Without wind you wouldn't capture the movement of the clouds or of the sea hitting the rocks.

That would be a shame!

Unfortunately, besides being very aesthetic, the wind can also be very treacherous. And when you're shooting outdoors, your camera will be exposed to its whimsical behaviour.

So even if you've chosen a safe spot and use a sturdy tripod, make sure your gear is safe and the wind won't be able to move it (or worse, throw it to the ground!).

If necessary, hang your backpack from the hook at the bottom of the central column of your tripod. But make sure the wind doesn't hit the backpack. Otherwise, it'll be even worse.

And of course, don't raise the center column. If you do, you'll change the center of gravity of your gear and it'll be less stable.

You forget to lock the mirror up (12)

In a DSLR, light goes through the lens and reaches the viewfinder **after being reflecting off a mirror**. Thanks to an internal mechanism, when you press the shutter, the mirror is lifted. Therefore light reaches the sensor, and the sensor is able to capture it.

Unfortunately, for shutter speeds between approximately 1/15s and 1s, the vibration produced by the movement of the mirror will affect the final image. Without a doubt the photo will be slightly blurred. After 1s, this vibration no longer affects your photo.

To avoid this problem, turn the mirror lock-up feature of your camera on.

Once you do so, the first time you press the shutter button, the mirror will lift and lock. The second time, the shutter will open. So all you have to do is wait for a couple of seconds between the first and second time you press the shutter and you'll avoid any vibration.

Note: *If you have a mirrorless camera, you won't make this mistake ;)*

Section 21:

12 photographers that excel at shooting with filters

Here is the list of photographers that I love because they excel at shooting with filters. They're true masters.

In fact, some of them have already been PhotoPills Masters in one of our favorite events: the **PhotoPills Camp**.

I hope they inspire you.

If you have some other name in mind that you think is worth knowing, share it with the tribe by leaving a comment at the end of this guide :)

Francesco Gola

Francesco Gola loves two things: seascapes and Nutella. Although I'm not sure if in this particular order... ;)

And to photograph the coast as he does, you should have a lot of expertise, a great photographic eye and an arsenal of filters! Of all the photographers I know, he has the most complete collection of filters.

But having top-quality equipment is not enough, you have to know how to use it. That's why Francesco is one of my references when it comes to long exposure photography with filters.

All his images with the pastel tones, silky seas and soft clouds you like so much are single exposures. In other words, Francesco doesn't blend shots when post-processing his pictures. He's a magician who does it all at once...

Daniel Kordan

Daniel Korzhonov, better known as **Daniel Kordan**, is a Russian landscape photographer currently living in Tuscany (Italy). And within landscape photography, he has a special interest in mountain and seascapes.

Although he's passionate about travel and likes to explore the world, he also enjoys returning again and again to a number of destinations: the Lofoten Islands, Patagonia, Lake Baikal or Kamchatka. Daniel says he feels "*at home*" there.

Daniel's photographs have been published extensively around the world in a wide variety of media. One of his great strengths is the mastery of filters that help him capture mind-blowing long exposures. The fact that many of his shots include water makes the use of filters essential.

José B. Ruiz

If you haven't heard of **José B. Ruiz** yet, you're missing out.

He's one of Spain's leading nature photographers and has a long career. In addition to this, he has won a lot of awards (including Wildlife Photographer of the Year) and has been a jury member in numerous competitions. José is also a published author with more than 7 books about photography.

He's a great nature, portrait... and landscape photographer. As for the latter, José believes that a good landscape photographer must master the use of filters if he wants to capture good images. After decades of using them and having tried many brands, models and types of filters, he's a true master when it comes to shooting with filters.

And he even dares to move his filters during the exposure!

Sarah Hatton

Sarah Hatton calls herself a "long exposure photographer" because it's one of her favorite techniques. In fact, she admits that since she discovered this way of taking photos, she's been hooked. Because it's full of surprises: you never know what's going to come out until you see the final result on the screen...

Although her home is in Melbourne (Australia) she's passionate about nature and likes to photograph the wild landscapes of Australia, New Zealand, British Columbia and Alberta (Canada), Oregon and Washington (USA), Patagonia (Chile and Argentina) and a long list of destinations around the world.

I'm sure her photos will be a great source of inspiration.

Dany Eid

Dany Eid is a photographer with an interest in architecture, landscape (nature and urban) and travel. Lebanese by birth, he studied interior design and painting. His passion for photography started in 2003, while living in Egypt, although he decided to become a professional photographer after moving to Dubai in 2013.

Despite his versatility, he's a photographer who regularly shoots with filters. It's the best way to get those silky waters, a pinch of contrast and the clouds dancing around the skyscrapers. I'm sure many of his photos will leave you in awe.

And he's a fantastic **aerial photographer** thanks to his drone!

Marco Grassi

The love story between **Marco Grassi** and photography began in the best possible way: traveling for a year in New Zealand. Since then he has been travelling around the world and capturing with his camera the beauty he has found along the way.

Although his heart is in the Faroe Islands. What? You've no idea where they are? Hurry up and have a look at Marco's gallery :)

In addition to being a spectacular natural environment, it's one of his favorite spots and the perfect place to practice long exposures using his filters. Because, as you can imagine, Marco is amazing shooting with them. And the results are (you guessed it) impressive.

Thomas Heaton

Despite **his YouTube channel**, **Thomas Heaton** is a very talented landscape photographer with an (slight) obsession for composition.

As you can see in his photos (and in his videos), he often uses filters with the intention of capturing what our eye sometimes doesn't see. As expected, the results are spectacular.

And since he's a traveller and explorer, he often escapes from the UK in search of new locations and landscapes where he can put his photographic eye to work and achieve a composition that other photographers haven't captured yet.

Julia Anna Gospodarou

Julia Anna Gospodarou is an architect and photographer who lives in Athens (Greece). She is best known for her long exposure black and white photographs of buildings and other architectural elements. She also likes other genres such as nature landscapes and portraits.

Her work stands out for being a very personal and artistic vision (always in black and white) of the scene that she's facing. Obviously, the shooting plays a very important role. So since most if her pictures are daytime long exposures, she definitely needs filters.

But post-processing her images is an equally important work. In this sense, Julia Anna makes the most out of digital photography and post-processing tools in order to be as faithful as possible to her artistic vision, which she defines as *(en)Visionography*.

Felix Inden

Although he was born in Santiago de Compostela (Spain) where he lived for some years, **Felix Inden** is a German photographer whose main interests are nature landscape photography, especially in very cold environments, and urban landscape. His passion for photography began in 2011, after his wife Maria lent him a camera during a trip to Paris.

Since then he hasn't stopped learning and improving his style shooting long exposure with filters, among others. He's a self-taught photographer and his intention is to create images that provoke some kind of reaction in the spectator. He likes to call it "*emotional landscape photography*".

And yes, he definitely manages to convey an emotion with each one of his pictures.

Sean Bagshaw

For many years **Sean Bagshaw** was a science teacher until one day he decided to take the leap and become a landscape and travel photographer. As you can imagine, his passion for photography didn't just happen overnight.

Sean started taking pictures at university, when he was in charge of documenting the climbing and mountaineering trips he undertook with his friends. Little by little he refined his technique (including shooting with filters, which is something he regularly does) and his style. One day, he focused his travels on photography rather than on climbing.

For him, the most important thing has always been to find, and later develop, his own way of capturing a scene. That constant quest is what makes him a unique photographer.

Erin Babnik

Erin Babnik likes to define herself as a "*professional adventure photographer*", which is a very broad term encompassing landscape, travel and nature photography. And she also loves teaching.

Her professional career began in a very different world: for many years she was an art historian, photographing archaeological excavations and museums for educational and research purposes. Subsequently, she was a commissioned photographer for several years before finally becoming a nature landscape photographer with a special interest in mountains and deserts.

Her work has been featured in over a hundred publications, including books, magazines and travel guides. And if you take a look at her images, you'll notice that she has a penchant for

capturing long exposures with filters.

Paul Zizka

Although he was born in Quebec City, his love of the mountains led him to move to Banff where one of Canada's most impressive national parks is located. There, **Paul Zizka** is mainly focused on landscape and adventure photography (for which he often needs filters).

But, as a good adventurer, Paul's work is not limited solely to photographing Canada. He has been in 7 continents capturing places as impressive as Antarctica, Norway, Svalbard, Nepal, Greenland, several Caribbean islands, Niue, French Polynesia, Namibia and the Faroe Islands.

His images have been published in Maclean's, National Geographic Adventure, Alpinist, Huffington Post, The Guardian, Canadian Geographic, Islands, PhotoLife, Fodors.com and Explore Magazine.

Section 22: What's next?

Now it's time for action...

It's your turn.

Put into practice what you've learnt.

Make a mistake!

And refer to this guide as many times as you need. It'll help you get around all the obstacles you encounter along the way.

A path that, without a doubt, will lead you to master lens filters and long exposure photography to capture amazing pictures...

And if you run into an obstacle that's not explained in this guide, let me know by leaving a comment below.

I'm here to help ;)

Oh!

One last thing.

Take a look at the **'Exposure in Photography: The Definitive Guide'**.

It's worth its weight in gold.

You'll learn to expose in all kinds of situations.

Never stop learning!

Antoni Cladera is a landscape photographer with commitment to the environment. Artist of the Spanish Confederation of Photography and member of the Spanish Association of Nature Photographers (**AEFONA**). He's part of the PhotoPills Team.

Special thanks to **Sandra Vallaure**, a great photographer and friend, for her tremendous help in making this article possible.

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