8 Tips for Long Exposure Photography

A Post By: **Elliot Hook**

Long exposure photography has become very popular in the last couple of years, getting a lot of coverage in landscape photography magazines and on photo sharing websites.

Pitstone Windmill at sunset (ISO100, f/18, 118 s)

With the ever-increasing number of options for 10-stop neutral density (ND) filters on the market, there has never been a better time to give it a go.

However, taking photographs when using such high-density filters gives rise to a set of problems that you may not have previously considered, so this article is intended to give a few useful tips that I have picked up since starting my journey learning about long exposure photography.

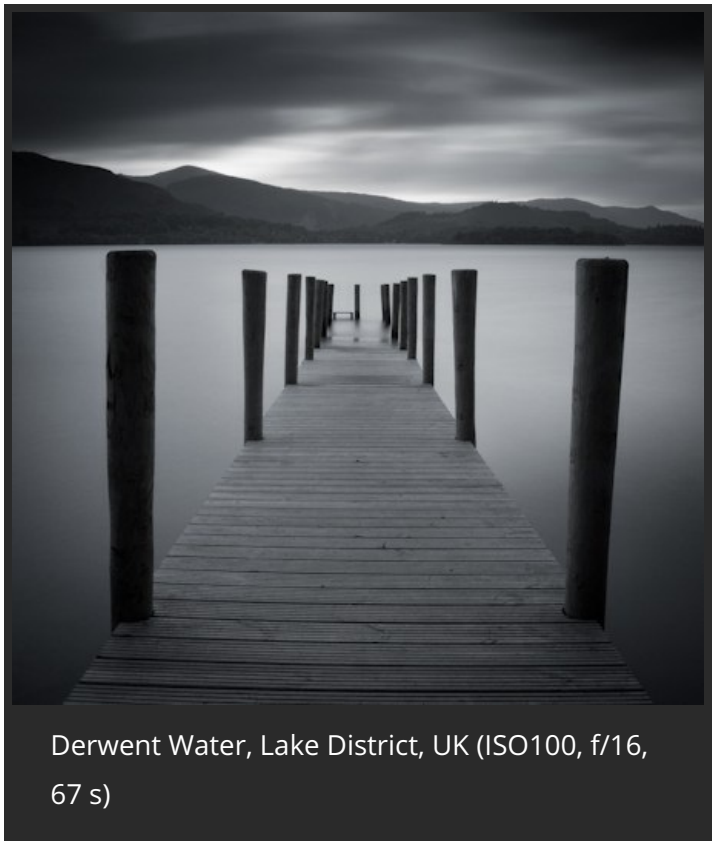
First, a bit of Background...

A neutral density filter should be just that: neutral; blocking out light without leaving a colour cast on the resulting image. Each ‘stop’ of an ND filter reduces the amount of light entering the camera by a factor of 2, i.e.:

- 1 stop = 21 = 2 = ND2
- 2 stops = 22 = 2 x 2 = 4 = ND4
- 3 stops = 23 = 2 x 2 x 2 = 8 = ND8
- 4 stops = 24 = 2 x 2 x 2 x 2 = 16 = ND16
- 10 stops = 210 = 2 x 2 x 2 x 2 x 2 x 2 x 2 x 2 x 2 x 2 = 1024 = ND1024

A fairly common 2-stop filter (often referred to as 'ND4') reduces the amount of light hitting the sensor by a factor of 4. A 3-stop ('ND8') filter by a factor of 8 and so on, until you get to 10-stops, when the light is being reduced by a factor of 1024, meaning that the shutter needs to be open for over 1000x longer than without the filter.

Whilst this is the reason that you get silky smooth water or clouds rushing across the sky, it is also the reason why your workflow will need to be adapted to overcome issues as a result of the huge reduction in light.



Derwent Water, Lake District, UK (ISO100, f/16, 67 s)

On to the Long Exposure Photography Tips...

Tip 1: Whilst a tripod is considered a baseline requirement for many landscape photographers, it is even

more important when shooting with a 10-stop filter. Exposures can easily extend to greater than a couple of minutes, so it is vital that your tripod is as sturdy as can be. This typically means ensuring that the legs are stood on firm ground, the centre column is not extended and the strap is secured so not to catch the wind.

You will often read that people recommend hanging your camera bag from the tripod to add ballast weight, however I think that it can often act as a large sail and cause greater instability if windy, so I instead tend to place a beanbag (full of uncooked rice) on top of the camera to add extra weight, without significant additional surface area.

Tip 2: Given that the filter is incredibly dense, unless the conditions are really bright, there will not be enough light getting through to allow the autofocus to function. Therefore, it is best to compose and focus your shot without the filter, switch to manual focus and then carefully attach the filter. This way the lens will not hunt for focus when you press the shutter.

Tip 3: It is important to close the viewfinder shutter, or at least cover the viewfinder, to ensure accurate light metering (if shooting in an automatic exposure mode, such as aperture priority) and to prevent stray light from sneaking in during the exposure. I'm not sure how critical the second point is but given how much the auto-metering is affected by the open viewfinder, I no longer take the chance so ensure it is closed before taking my shot.

Tip 4: For exposures in excess of 60 seconds, you'll need to be able to locate the 'BULB' mode of your camera. Switching to BULB enables you to open the shutter for as long as you choose, enabling really long exposures, meaning:

- You will most likely need a remote shutter release cable so that you can lock the shutter open for a given period of time (it's a good idea to attach the remote release to the tripod using Velcro during the exposure, again to stop it from catching the wind and swinging around).
- You will most likely need a way of calculating how long to leave the shutter open for. In some cases, the maths is trivial (for example, if an exposure without the filter is ¼ s, when using a 10-stop filter it becomes 0.25 s x ~1000 = 250 s, 250 s / 60 = ~4 minutes) but in others it can be more difficult, and as the light conditions can change pretty quickly, a phone app (such as NDCalc for android/iOS) can come in very handy.

Tip 5: Choose the right conditions. Ideal conditions for long exposure photography are when there is dappled cloud and a strong wind (see Tip 1). If there are no clouds, or no wind, there will be nothing to add movement. I prefer to shoot around sunrise/sunset, as then the sun is low in the sky, increasing the contrast in the clouds, resulting in an exaggerated streaking effect in the final image.

Sunrise over the limestone pavement (ISO160, f/13, 50 s)

Tip 6: Even at low ISO, super long exposures can introduce noise in the form of hot pixels. You may not be able to see these when viewing the results on the LCD screen of your camera, but when viewed at 100 % on your computer monitor, you may find a number of bright red/green/blue pixels in your image.

An effective way to remove them is to take an exposure of identical length, at the same ISO, with the lens cap on. The hot pixels will be identical in all shots, almost like a finger print of your sensor, so by replicating the exposure with the lens cap on, you will generate an entirely black image, with the same hot pixels, to subtract away from your chosen image during post-processing.

Tip 7: Some brands of filter are known to leave more of a colour cast on the final image. This is a great reason (one of many) to shoot in RAW, as the colour casts can often be corrected during post-processing. Sometimes, for particularly long exposures, it may just irreversibly compromise an image and, in those instances, a black and white conversion is often the best way to overcome it.

Tip 8: A long exposure does not make up for poor composition. In fact, the you will probably be even more frustrated at the resulting photograph given the additional effort required to take and process it.

To Conclude...

Whilst I have discussed quite a few additional points to consider when taking long exposures with high-density ND filters, you soon learn to adapt them into your own work pattern that becomes routine. I find that taking long exposures often requires more planning, thought and processing than with my other photography, however the results can be breathtaking and are often worth it.
If you have any additional tips or issues that I haven't mentioned here, I'd love to hear them in the comments.

Also check out these 15 Fantastic Examples of Long Exposure Photography.

Read more from our category

Elliot Hook is a wildlife and landscape photographer based in Hertfordshire, UK. Elliot loves being outdoors with his camera, and is always looking to improve his own photography and share what he has learnt with others. Elliot also can be found at his **website**, on **Twitter**, **Flickr** and **500px**.

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Some Older Comments

Sheena
June 4, 2013 08:01 am

There is a Cherry-Almond Smoothie in the book will be Gaga s dangerous zone dieting habits. It will slow down. Ok, so moving on to NR3: the importance of exercise and physical fitness.

Ken
June 2, 2013 02:51 pm

All your tips make absolute sense but number 6 was a really big plus for me. I'm using my old Oly E500. the sensor takes wonderful landscape shots but I can't push past ISO 320 or I have noise.
When I tried some light painting I got some good results but then I noticed...yes you get it. Those red, green and blue pixels.
I dismissed them as noise and gave up on night shots thinking it was a sensor problem. well, yes it was but now I know how to cure it.
Thanks Ken

Photography by James
March 24, 2013 08:53 pm

Shane,
It sounds like you didn't have a strong enough graduated filter on your sky to tone down the highlights. The difference in EV (exposure value) between the sky and the foreground will always be the same number of stops so I would advise the following:
1. With no filters in place measure the foreground exposure only by angling your camera to exclude sky from the viewfinder. Make a note of the shutter speed.
2. Set your camera to use spot metering and, keeping the same ISO and aperture settings, pick a point in the sky that you want to be properly exposed and note the shutter speed given by your camera.. This need not be the brightest point, that is up to you.
3. From the difference in indicated shutter speed you can then calculate how many stops your ND Grad needs to be to tone down your sky. For example, if the first shutter speed is 1/30 second and the second is 1/125, then the difference is 2 full stops. If the first is 1/8 it is 4 stops and so on. I suggest using shutter speed as the basis of measurement as there is a wider range of stop settings with that option than keeping shutter speed constant and changing the aperture.
The problem then becomes whether you have (or can even get) a strong enough ND grad for the exposure range. If not then your options are:
1. Shoot multiple exposures and use HDR software or blending techniques in Photoshop to combine the images.
2. Shoot in RAW and use Lightroom to manipulate the image.
For myself I have barely looked at Photoshop since I started shooting RAW and "developing" my images in Lightroom. It is definitely the way to go in my opinion.

Zafer Kocabey
March 11, 2013 10:48 am

To Geerd-Olaf Freyer | YaYapas:
If you use Lee filters, it is not so much difficult to detach the filter form the lens. The holder is attached to the adaptor via a clip and what you should do is just pulling out that clip. Make a new composition and attach the holder with filter on again.
To Elliot Hook:
Thank you for this great outline. I think using ND filters gives best results if used with ND Grad filters to overcome overexposures or very dark areas.

Michael
March 7, 2013 10:15 am

Great tips. I haven't gone to the expense of ND filters yet, only using the naturally low light of dusk/dawn or as is often the case around here in the Pacific NW where I live, heavy clouds. This combined with ISO 50 and fairly small apertures plus my CPL often gives very long exposure times. Starscapes I will use the self-timer. Your tip # 5, by the way, seems quite subjective. For one thing, the clouds can be moving quite fast even when there is no wind at ground level. I've never thought much about wind when taking long exposures. For one thing a major benefit in my opinion is not the streaking but the increased saturation of color.

Michael Girard
January 5, 2013 02:16 pm

Very good article, I've tried a few shots but am still looking for the right combination of settings to be really happy with an image.
One thing I would change with your tips is in #2, I would compose/focus, add the filter and then switch to manual focus, by adding the filter with the autofocus on it is locked in place whereas if you switch to manual and then add the filter I find that I can't help moving the focus off.

Shane McDonald
January 2, 2013 04:54 pm

Wonderful post. I recently did a shoot with 2 x ND8 filters. The result was very good but the sky highlights were very bright in contrast to the foreground even though I metered for the foreground and had an ND grad filter on the sky. Any advice on metering on this? I was using ISO 100 at f/22 but perhaps a higher ISO and f stop around f/16 might have been a better choice.

Tony Prower
December 7, 2012 01:43 am

Amazing work, love the classic jetty shot at Derwent water. A wonderful collection showing the magic of long exposure photography.

Liliana
November 27, 2012 12:12 pm

Great information. Thanks.
I understand that turning off the mirror lockup is also helpful?

stevesdatingblog.com
October 9, 2012 07:33 am

You really make it seem so easy with your presentation but I find this topic to be actually something which I think I would never understand.
It seems too complicated and extremely broad for me. I'm looking forward for your next post, I will try to get the hang of it!

Andy Keeble
September 30, 2012 07:21 am

Excellent advice, particularly about covering the view finder.
Thank you.
Andy

Arthur Raynolds
September 29, 2012 04:28 pm

Thank you for providing this site. I find your site easier to read and more informative the some of the American Photo web sites. I live in the mountains of Western North Carolina.
I'm not sure if it has been mentioned by other photographers, but I find shooting fireworks is best when the shutter is set on 6 second exposures and the brightness is controlled by the f-stop. Typically I shoot at f-11, but wil stop down durning the grand finale. I prefer an ASA/ISO of 100, but that may be bumped up depending on a number of factors like cloud dispersal & distance from the firing point. Tripod is of course a necessity as is a clear vantage point without glaring lights distracting from your image nor unseen powerlines in every shot. My camera of choice is the Nikon D200.
While I would like to share some photos, I have not learned how to set up a URL. I have not done flicker.
Thank you,

Chris
September 29, 2012 05:14 am

Tom - super cool shot. I love it!

Pikey
September 28, 2012 08:27 pm

Excellent Tips
Don't forget if you have liveview facility on your camera you will be able to see the image on the screen when using a 10 stop ND filter although the viewfinder will be completely opaque. Useful for image composition to save keep removing the filter from the lens when recomposing shots.

nick
September 28, 2012 11:30 am

Nice topic and well detailed.
for sun position i use this website to see the position of the sun (sunset/sun rise by hour).
once you try it, you will make part of your gadgets. soon will come up with more options. some very dedicated guys collects feedback from users.
http://suncalc.net/#/43.5349,-80.2797,20/2012.06.08/04:39

Nate
September 28, 2012 09:12 am

The only potential problem I see is using the uncooked rice. It is susceptible to moisture and if the sock/bag/container gets wet so does the rice and it becomes mush. Use plastic beads instead (experiment with the various sizes for your specific application). They function the same and shed moisture!

James Gonneau
September 28, 2012 05:45 am

An excellent article, and the comments have been just as good. I'll have to definitely try the trick with the lens cap on, sounds almost too good to be true.
A "Big Stopper" is on my wish list, but with just two Hoya ND4s (and a circular polorizer, which darkens as well), I'm pretty happy with the results:

gonzalo
September 27, 2012 08:03 pm

Thanks very much ajm ¡¡

AJM
September 27, 2012 07:46 pm

Gonzalo; do a search for "dark frame subtraction photoshop".
You'll find some paid applications and lots instructions for doing this in Photoshop, but I believe most any image editor should have the features necessary to do this. (just need to be able to create a "difference" layer)
Here is one page I found that describes it pretty well.
http://www.takegreatpictures.com/photo-tips/digital-photography/dark-frame-subtraction-using-adobe-photoshop-br-by-chris-limone

David Walker
September 27, 2012 07:19 pm

Great article Elliot, very informative.

Ranjith
September 27, 2012 11:33 am

Here is another long exposure shot
http://www.flickr.com/photos/msranjith/6937340036/in/photostream/

Bloice Davison
September 27, 2012 10:27 am

Also, I forgot to mention the mirror lock up feature. Would have helped me that day too.

Geerd-Olaf Freyer | YaYapas
September 27, 2012 08:26 am

Great article and beautiful pictures.
The only thing that bothers me at my ND filter, is the lengthy procedure (after making the first capture) of removing the filter, selecting a new image composition, focussing, reattaching the filter, making the long exposure, internal noise reduction in the camera, ... and over again. What do you think of variable dense filters or the Big Stopper system? I think it would be easier with such filters to refocus between the long exposures.
Feel free to visit my tries
http://www.flickr.com/photos/go_freyer/6135826114/in/set-72157627689051404/
or
http://www.flickr.com/photos/go_freyer/sets/72157627689051404/with/6135826114/

John Davenport
September 27, 2012 02:55 am

Used an ND8 to capture this shot off the rocky RI coast at sunset http://www.phogropathy.com/sunset-on-point-judith/ one of my favorites so far with my ND filter. It really does wonders!

marius2die4
September 27, 2012 01:18 am

Greats article and I love the pictures.
Some of my pics:
http://marius-fotografie.blogspot.ro/2011/10/de-noapte.html

gonzalo
September 27, 2012 12:56 am

about tip 6, "An effective way to remove them is to take an exposure of identical length, at the same ISO, with the lens cap on. The hot pixels will be identical in all shots, almost like a finger print of your sensor, so by replicating the exposure with the lens cap on, you will generate an entirely black image, with the same hot pixels, to subtract away from your chosen image during post-processing." How you

do that?
Thanks in advance, Gonzalo.

Collette
September 26, 2012 11:05 pm

Great tips on using ND filters. I had borrowed some from a friend once, but didn't do the research beforehand and quickly became frustrated. For some reason, it never occurred to me to do the focusing BEFORE putting on the filter, causing my camera to hunt all over the place. The rest of the less "obvious" tips were great too, especially on what weather conditions produce great images. Thanks for your insight, Elliot!

raghavendra
September 26, 2012 10:45 pm

love this tips, comes in handy
http://raghavendra-mobilephotography.blogspot.com/2011/08/train-comes.html

Duncan Fawkes
September 26, 2012 06:28 pm

Good tips Elliot, nice work! I recently posted my own Guide to Long Exposure photography which fortunately includes includes some of these tips! http://www.duncanfawkes.com/a-guide-to-long-exposure/
I particularly like #8. I find that often long exposure is used to enhance an otherwise dull photo. In that way it becomes a visual "trick" in a similar way to some HDR rather than complimenting and enhancing an already good photo. So ye, focus on getting the composition right in the first place. It can be a good idea to frame the shot without the filters on as they can make the viewfinder/LV very dark to work with, and you don't want your "test shots" taking minutes to expose!

Elliot
September 26, 2012 06:18 pm

Thanks for the feedback, and cheers for sharing your shots!

JongMauriceMJde
September 26, 2012 04:36 pm

I took a couple of long exposure shots without the use of ND filters.. I am curious what the filters could do for these shots.
of course, tip number 5 isn't appliable on these..

Ranjith
September 26, 2012 03:41 pm

A very important and informative article on long exposure and use of ND filters. Now i am curious to lay

my hands on one those.
Here is my share of a long exposure.
http://www.flickr.com/photos/msranjith/6937371018/in/photostream

alex long
September 26, 2012 10:06 am

Hi elliot,
Deep gratitude to u for sharing long exposure photography always learning new things. Conditions, light, evironment and circumstances differ. Will apply what i learn here. Thanks once again for sharing.

Beetwo77
September 26, 2012 09:53 am

Meant to post my gallery! Sorry for the shameless self promotion but some people might find the images interesting:
http://www.flickriver.com/photos/9253227@N02/sets/72157631624064412/

Beetwo77
September 26, 2012 09:52 am

Great article. Thanks for covering the topic well. It really is a great way to photograph and requires plenty of thought. I have also been experimenting with more than 10 stops with great effect. I find with my Sony Nex, and its small filter size, its even cheaper to get into. I have recently put together a gallery of 10 or more stop images:

Scottc
September 26, 2012 08:58 am

Some great tips in this article, especially the description on how to focus and the breakdown on the ND filters. Long exposures are one of my favorites, these tips will help.
http://www.flickr.com/photos/lendog64/5072295436/

Tom
September 26, 2012 06:30 am

Love long exposure work- here's a shot taken on Saturday taken in Donegal Ireland
http://www.flickr.com/photos/51837419@N08/8016976629

Brian Fuller
September 26, 2012 06:11 am

Great article. Can't wait to try this myself. I have yet to use the bulb function and very rarely have hit 30 sec. I have a 2 stop circular polarizer and that is it at the moment. I need to get my hands on an ND16 for these Texas sunsets.

http://bit.ly/oufr4c

Alistair Scott
September 26, 2012 01:48 am

Great advice! Three other things i'd add:
1) If you don't have a remote release, an alternative for long exposures is to use the self-timer. Set it to about 10 seconds so that any vibrations that you may have caused by pressing the shutter button will have died away before the shutter fires.
2) If your camera has 'mirror lock up' that's an additional way of miminising vibrations. But, as with using a heavy ND filter, you will need to compose your scene before doing anything else.
3) An alternative type of ND filters are 'grads' ... half ND filter and half clear ... for holding back exposure on a particuléarly bright part of the scene, the sky shortly after sunset, for example.
Thanks for a great article!

Scott Wyden Kivowitz
September 26, 2012 01:26 am

Neutral density filters are so much fun to play with. I definitely recommend for people, who can afford it, to pick up a Lee Filter system instead of a screw on filter. Having the ability to pick your own ND density is priceless.

I need help with...

LANDSCAPE PHOTOGRAPHY TIPS

PORTRAIT PHOTOGRAPHY TIPS

PHOTO COMPOSITION TIPS

BEGINNER PHOTOGRAPHY TIPS

PHOTO POST PROCESSING TIPS

GET STARTED WITH CAMERAS AND GEAR