Lens review

2011-08-24

Sigma 150 mm f/2.8 APO EX DG OS HSM Macro

1. Introduction

Practically every producer has a 100 mm class macro lens on their offer. What's more, in the majority of cases, these are really well-done constructions so the competition on the market is fierce and the choice huge . When it comes to longer focal lengths, though, there is much less to choose from. For example neither Pentax nor Sony offer such lenses at all. Canon has the EF 180 mm f/3.5 L in its line-up but that lens is simply beyond financial reach of many macro photography enthusiasts. If you compare it to the offer of Sigma you must admit it looks very good indeed – the company has launched macro lenses with the following focal lengths: 50,70,105,150 and 180 mm. It is worth adding that the 105 mm and 150 mm models have been updated recently, gaining image stabilization.

In short, Sigma's market position has been good nowadays. Its biggest rivals, Canon and Nikon, have lenses with image stabilization as well but their focal lengths amount to 100-105 mm. Sigma not only offers you stabilized devices but also a 150 mm lens, which allows you to get 1:1 reproduction ratio with the object positioned at much greater distance from the lens; the microfauna photographs can be easier to shot and not so interfering in the natural environment.

Courtesy of the Sigma ProCentrum company, which lent us the lens for testing in a flash, we can invite you today to read the full Sigma 150 mm f/2.8 APO EX DG OS HSM Macro test.

You are also invited to get acquainted with our test procedure, described in the article "How do we test lenses?" If you feel it's still not enough, please go to our FAQ section where you can find some further explanation.

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Tokina AT-X 116 PRO DX AF 11-16 mm f/2.8

Lens review

2011-08-24

Sigma 150 mm f/2.8 APO EX DG OS HSM Macro

2. Pictures and parameters

Construction:	13 groups / 19 elements
Filed of view:	16.4 deg. (10.8 deg. for DX)
Aperture:	f/2.8
Min. focusing dist.:	0.38 m
Filter size:	72 mm
Dimensions (length x diameter):	150.0 mm × 79.6 mm
Weight:	1180 grams
Price:	1100 $

« Previous chapter | Next chapter »

Chapters

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Lens review

2011-08-24

Sigma 150 mm f/2.8 APO EX DG OS HSM Macro

3. Build quality and image stabilization

When it comes to 150 mm macro lenses, currently there are only two Sigma models present on the market: the new, stabilized one and its predecessor. We are forced to add also 180 mm devices to our comparison. The following chart compares parameters of all the aforementioned lenses. As you see, optics with the stabilization became more complex and the whole instrument – heavier and bigger.

The Sigma 150 mm f/2.8 APO EX DG OS HSM Macro is quite big and heavy; a tripod collar, added to the set, also can hardly be called small or lightweight so it even enhances the sturdy impression (actually it might be considered an advantage as it also ensures greater stability of the whole set while attached to a tripod).In the photo below the tested lens is positioned between the Canon EF 100 mm f/3.8L Macro IS USM and the Sigma 1.4/30.

The tested lens belongs to the EX so top-of-the-range Sigma series of lenses. Small wonder it is very solidly built and you shouldn't expect anything else – Sigma equips even its cheapest devices with a metal mount and still produces them only in Japan.

The lens begins with a metal bayonet mount and contacts. The mount surrounds a rear element which is immobile and hidden more than 1 cm inside the casing. The rear element is almost 3 cm in diameter.

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Already on the black, smooth casing of the lens we can locate an area with an inscription OPTICAL STABILIZER. Right behind there is a place where you put the ring of the tripod collar. Further on, you can find another inscription with the name and the parameters of the lens. On the left (looking from the top) we get a whole series of switches. The first one limits the range of the focusing mechanism. We have three ranges to choose: the full range (FULL), from 0.53 of a meter to infinity and from 0.38 of a meter to 0.53 of a meter.

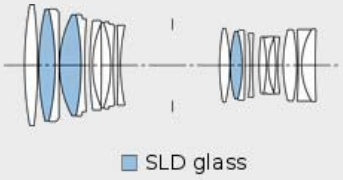
The next switch is used to choose the mode of the focusing mechanism (AF/MF). Even when we set the AF mode we still can move the manual focus ring. The last switch controls the optical stabilization. You can set it in the OFF position, to switch the stabilization off, or in 1 and 2 modes, which are used respectively for manual photography and photography of moving objects.

Immediately above the inscription with the name and the parameters of the lens there is a clear distance scale expressed in feet and meters. The next part of the lens consists of a manual focus ring which is as wide as 52 mm. Most of its surface is covered by rubber ribs, making the grip easier; only at the top of it there is some smooth area left for a golden stripe which is the brand name sign of the EX series. The ring itself works evenly, smoothly, with no play or wobble, allowing precise settings. The turn through less than 170 degrees is needed for covering the full range of the ring.

The other part of the lens consists of a hood thread. The hood is added in the box; what's more it comes in two parts. When you take photos using a full frame body you use only a standard hood. If you use a body with an APS-C/DX sensor, less vignetting-prone, you can add an extension of the main hood which makes the front element hidden very deep indeed. By the way the solution looks rather risky because the whole lens set becomes almost twice as long – it can be seen in the photo below.

The front element of the lens is also immobile and 5.5 cm in diameter. It is not hidden inside the casing almost at all, only surrounded by a non-rotating filter thread, 72 mm in diameter. The fact that the front and the rear element don't move ensures good tightness of the lens, which doesn't suck the dust inside. On the other hand, though, the focusing is performed by changing the position of inner elements against each other so the focal length of the lens is noticeably shortened while passing to 1:1 reproduction ratio. It is also worth mentioning here that images in 1:1 ratio can be obtained when the photographed object is situated a bit further than 18 cm from the front element.

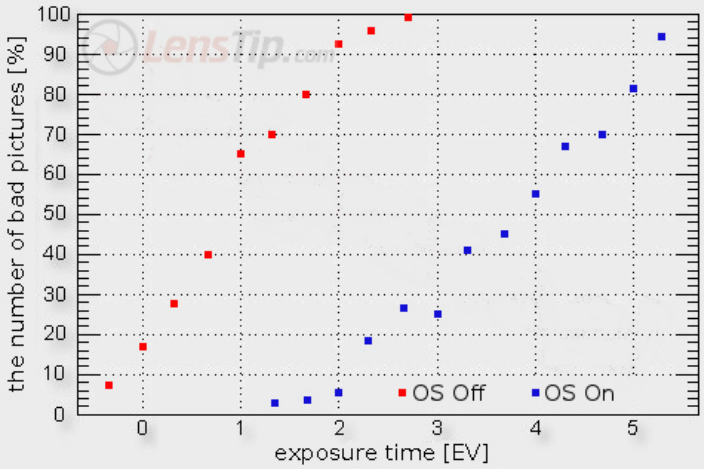
The optical construction of the Sigma 150 mm OS consists of 19 elements set in 13 groups (3 elements more than in the case of its predecessor), and as many as three elements were made of low-dispersion SLD (Special Low Dispersion) glass. Special Super Multi-Layer Coatings, used here, are supposed to ensure good performance against bright light and images with good contrast even at the maximum relative aperture. The lens is also equipped with a rounded aperture with nine diaphragm blades which can be closed down to the value of f/22.



Conventionally we get a lot of accessories with a Sigma lens but this lens first of all comes with a three-year warranty period, which can be extended by next two years for additional charge. In the box you can find both caps, a hood, a hood extension, a tripod collar and a hard case with a strap. It is also worth mentioning that the tested lens can cooperate seamlessly with 1.4x and 2.0 Sigma converters.

Stabilization

Sigma declares unvaryingly that the stabilization efficiency in its lenses reaches 4 EV. Even several years ago the real stabilization efficiency was only about 2 EV, though. The latest launches showed that the OS mechanism is being improved so its efficiency can get to and even exceed the level of 3 EV. How does the Sigma 150 mm OS fares? Let's glance at the graph presented below.



It shows the percentage of blurred photos with the stabilization switched on and off, depending on the exposure time, expressed in EV (and 0 EV is the equivalent of 1/160 of a second). As you see, the maximum distance between both curves reaches 3.3 EV and we determine the value of the new Sigma's stabilization system as such. This result is good and the lens should be praised for it.

« Previous chapter | Next chapter »

Chapters

- 1. Introduction
- 2. Pictures and parameters
- **3. Build quality and image stabilization**
- 4. Image resolution
- 5. Chromatic aberration
- 6. Distortion
- 7. Coma, astigmatism and bokeh
- 8. Vignetting
- 9. Ghosting and flares
- 10. Autofocus

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Lens review

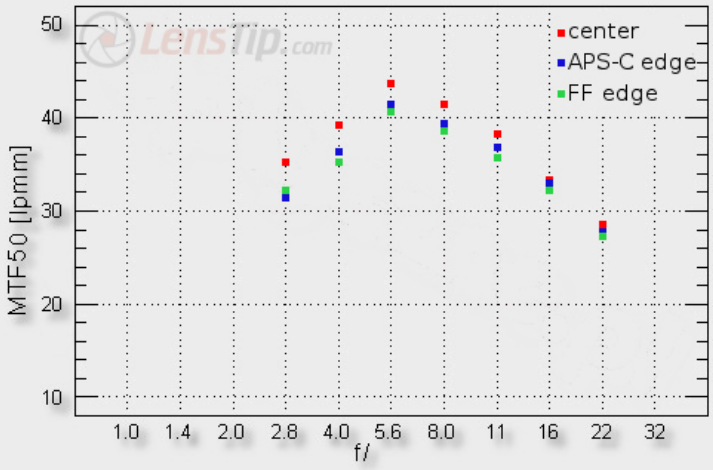
2011-08-24

Sigma 150 mm f/2.8 APO EX DG OS HSM Macro

4. Image resolution

The resolution test of the Sigma 150 mm f/2.8 APO EX DG OS HSM Macro was based on RAW files from the Nikon D3x full frame reflex camera. The measurement errors ranged from 0.2 to 1.0 lpmm. It's worth remembering here that the decency level in the case of tests performed on the D3x is situated near 30-31 lpmm and the best fixed-focal lenses can reach results near 46-47 lpmm. It should be also mentioned here that the decency level, chosen by us here, is really only a conventional value. We set it assuming that the level reached near f/16 aperture would be a good resolution indicator. If you close down the aperture more the diffraction will degrade the image to such an extend that it will seem rather fuzzy. Of course you should remember that every user has his/her own image resolution requirements so for some people these 30-31 lpmm will be fully acceptable and for others – not quite.

Let's check how the tested lens fares in the frame centre, on the edge of the APS-C sensor and on the edge of full frame.



It can be noticed at once that even at the maximum relative aperture the lens doesn't have any problems with generating images of good quality. On stopping down the situation becomes even better and by f/5.6 the Sigma reaches the level of 44 lpmm. On the one hand you can be a bit disappointed because macro lenses often dazzle with record-breaking results. On the other hand you really shouldn't carp about the performance here. The quality of the image is very good, momentarily even splendid, and these values are still better than those of the predecessor, so praised by us before.

The question why there are no record-breaking results in the frame centre is answered by the performance on the edge of the frame of the smaller and the bigger sensor. The values we see there are really excellent. The image is useful already at the maximum relative aperture and on stopping down it is hardly worse than that in the centre. By f/5.6, on the edge of the full frame sensor we get as high as over 40 lpmm; such results are so good that I really can't remind myself of any other lens which has performed better on full frame. Even the Canon 100L Macro, so praised by us, on the edge of full frame got to maximum 38 lpmm and that result was, after all, reached on the EOS 1 Ds MkIII, which, with good lenses attached, can produce MTFs higher by 1-2 lpmm than

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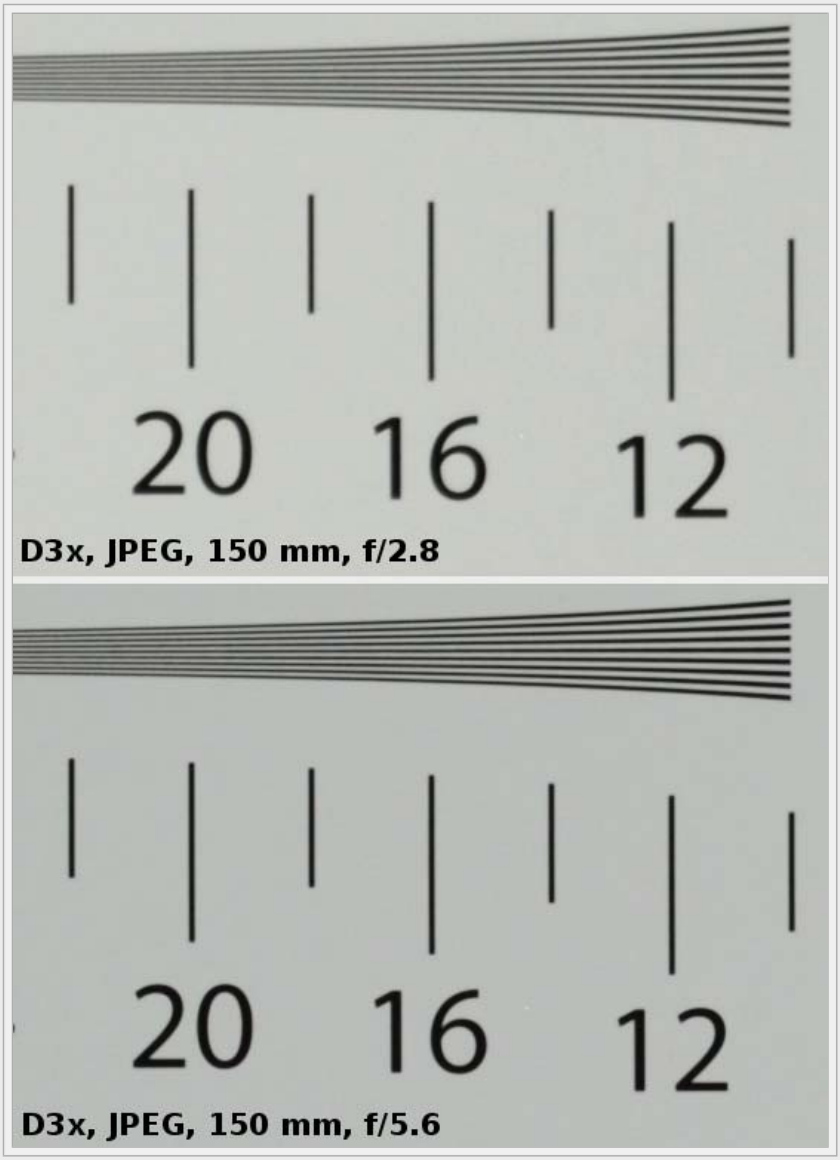
the Nikon D3x. We can state that the results of the Sigma on the edge of the frame are about 10% better than those of the splendid Canon.

Apparently Sigma knew what it was doing. There are no records in the frame centre but the level still remains high. There are records on the edge, though, so the image is of very good quality across the frame which is important if you e.g. photograph the reproductions.

The crops below were taken from the frame centre of our test chart.



Page generated in 0.032 s.

« Previous chapter | Next chapter »

Chapters

Lens review

2011-08-24

Sigma 150 mm f/2.8 APO EX DG OS HSM Macro

5. Chromatic aberration

The photo below, taken at the maximum relative aperture (it amounts to f/3.3 because macro lenses get slower when we take photos from a close distance) shows that the tested lens has no problems whatsoever with the longitudinal chromatic aberration.

The graph below additionally shows that the lateral chromatic aberration correction is problem-free either. The assessment in this category can be only and solely outstanding. The results, presented here, are just a tad better than those of the Canon 100L Macro and the Nikkor 105 mm VR and very similar to the performance of the tested lens's predecessor.

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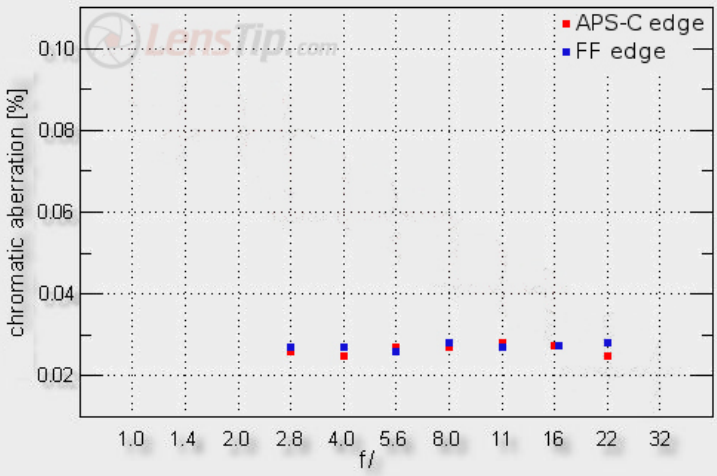

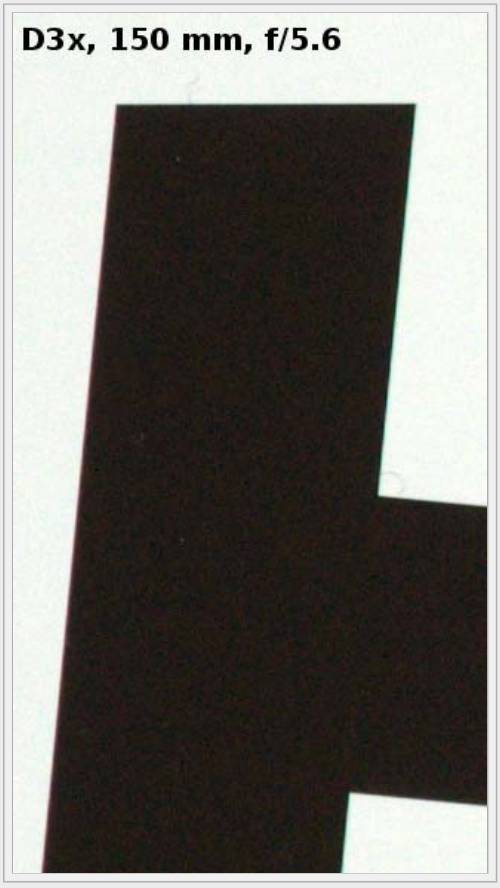

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« Previous chapter | Next chapter »

Chapters

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Lens review

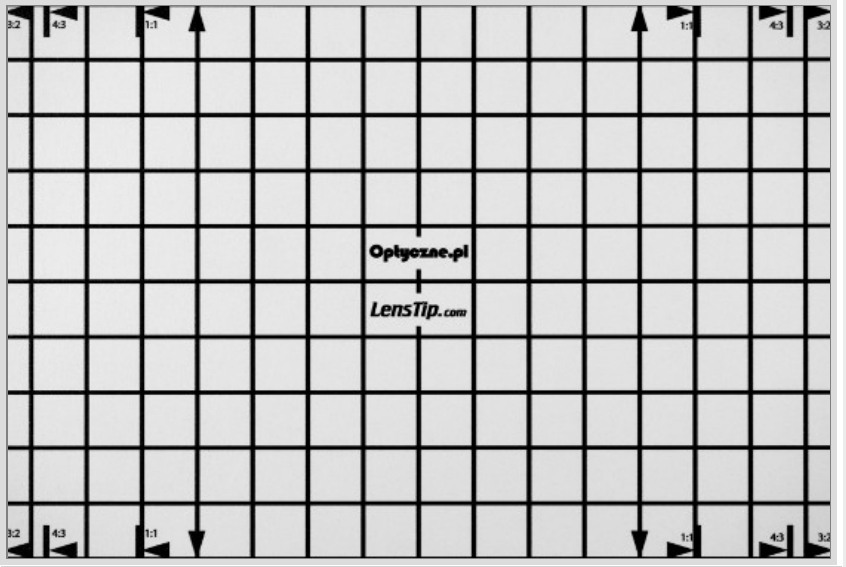
2011-08-24

Sigma 150 mm f/2.8 APO EX DG OS HSM Macro

6. Distortion

Dealing with a 150 mm macro lens you should hardly expect any distortion problems and we don't encounter them here. Working on the APS-C sensor the lens shows imperceptible "pincushion" which value we determined as 0.06%. On a bigger detector we got the result of 0.08% which shouldn't bother us either. In fact for both sensors, the distortion should be considered zero within the margin of error.

Nikon D200, 150 mm



Nikon D3x, 150 mm

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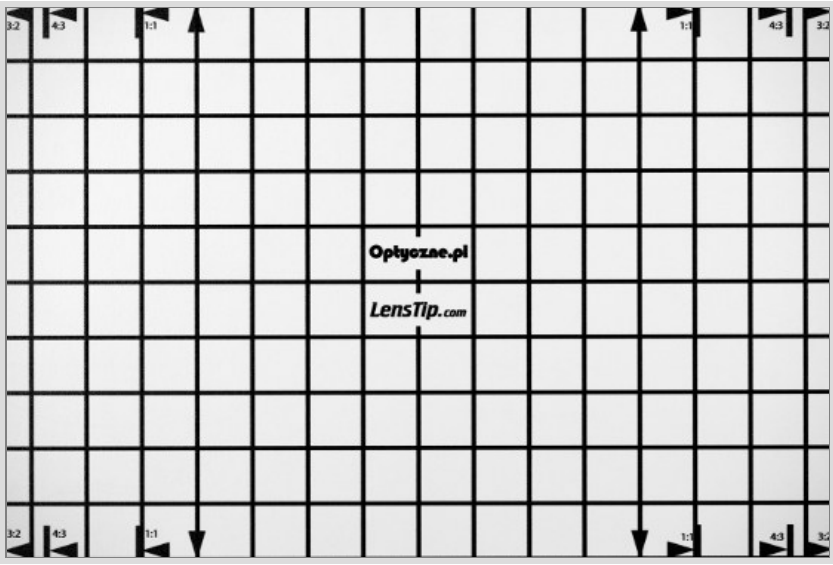

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« Previous chapter | Next chapter »

Chapters

Lens review

2011-08-24

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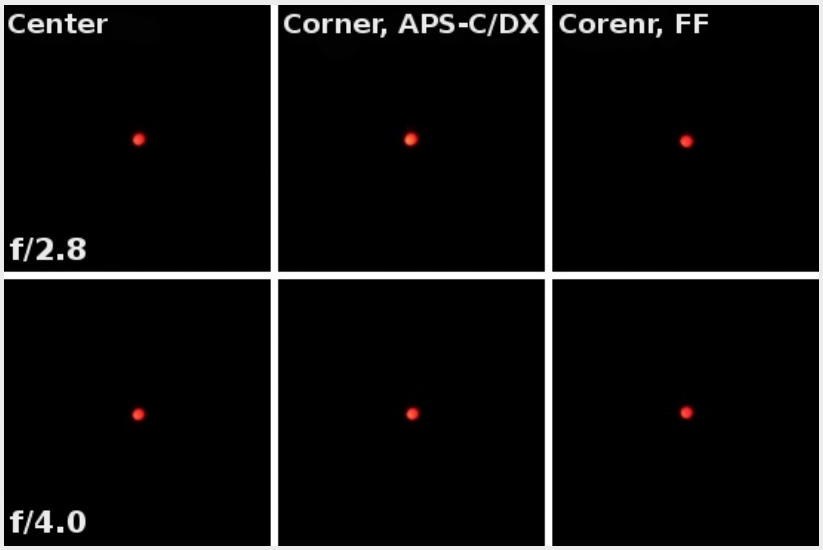
7. Coma, astigmatism and bokeh

The crops below show that the coma is not the slightest problem of the tested lens and it is true for the corner of the smaller sensor and for the corner of full frame alike. In a way it was predictable because the excellent image quality on the edge of the frame doesn't comes from nothing. If the lens had big coma you wouldn't see a sharp image on the edge of full frame.



The astigmatism is corrected in an equally perfect way. The average difference between vertical and horizontal MTF50 function values amounted to just 2% which is an ideal result.

The out of focus images of the diode, presented below, are also very nice indeed. The layout of light is very even. What's more, already by f/5.6 aperture it is difficult to perceive noticeable differences between the diode image in the frame centre and that in the corners of both sensors.

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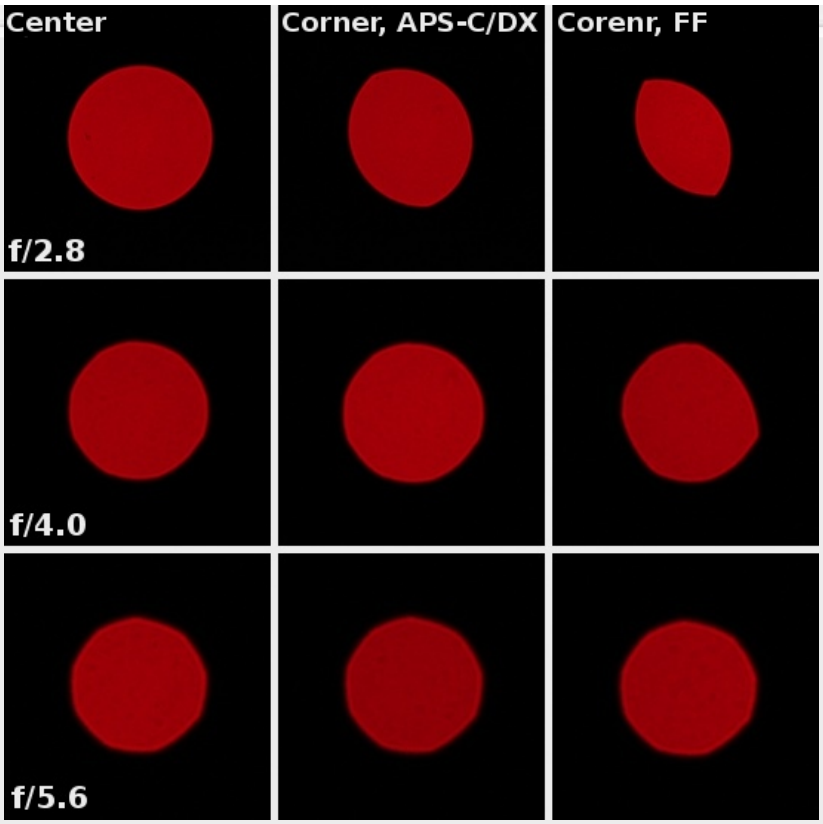

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« Previous chapter | Next chapter »

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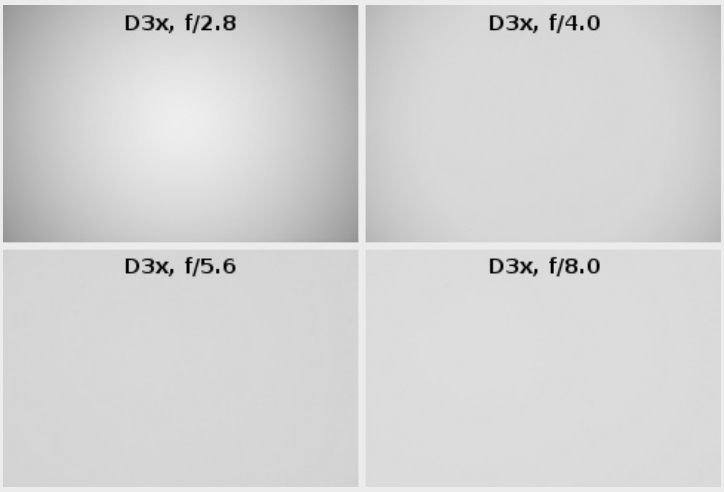
8. Vignetting

The crops below show how the vignetting looks like when you use the smaller APS-C/DX sensor.

It is clear that this aberration is hardly a serious problem here. At the maximum relative aperture the relative brightness loss in the frame corners amounts to 27% (-0.90 EV) and it disappears practically completely (the level of only 3%) by f/4.0. On full frame the vignetting level is higher – you can see it in the photos, presented below.



In fact only at the maximum relative aperture we could complain a bit – the vignetting there is 37% (-1.31 EV) and easy to perceive. The problems disappear by f/4.0 where the light fall-off in the frame corners is just 16% (-0.50 EV). By f/5.6 the vignetting disappears completely, amounting to just 3%.

« Previous chapter | Next chapter »

Chapters

- 1. Introduction
- 2. Pictures and parameters

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Lens review

2011-08-24

Sigma 150 mm f/2.8 APO EX DG OS HSM Macro

9. Ghosting and flares

I must honestly admit that in this category I didn't expect any problems. Sigma lenses usually perform very well against bright light and additionally in this case the longer focal length made any slip-ups even less probable. A huge, not sheltered front element makes itself felt, though, and flares in certain circumstances can be easily caught. Apparently Sigma was aware of the problem, adding a big hood and a special hood extension for photos taken on APS-C/DX sensor reflex cameras with the lens.

Defending the tested lens a bit you can say that a macro device with such a focal length is hardly ever used with the Sun near the frame corner and, after all, the problems, presented below, can be experienced only in such a situation.

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- Tamron SP AF 17-50 mm f/2.8 XR Di II LD Aspherical (IF)
- Canon EF 70-200mm f/4L IS USM
- Canon EF-S 15-85 mm f/3.5-5.6 IS USM
- Sigma 8-16 mm f/4.5-5.6 DC HSM
- Tokina AT-X 340 AF-II 100-300 mm f/4
- Sigma 20 mm f/1.8 EX DG Aspherical RF
- Tokina AT-X 124 PRO DX II AF 12-24 mm f/4
- Nikon Nikkor AF 20 mm f/2.8D
- Tokina AT-X 116 PRO DX AF 11-16 mm f/2.8

« Previous chapter | Next chapter »

Chapters

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Lens review

2011-08-24

Sigma 150 mm f/2.8 APO EX DG OS HSM Macro

10. Autofocus

The Sigma 150 mm OS Macro is equipped with an ultrasonic autofocus motor. Its presence guarantees silent work but, unfortunately, not good speed. In the FULL mode running through the whole scale takes even two seconds. Using the focus limiter we can shorter that time by half but even then the result is nothing to be proud of.

In the case of this lens's predecessors we complained a bit about the accuracy of the focusing mechanism. The new Sigma 150 mm f/2.8 Macro improved its performance there because the number of misses in studio conditions reached 6%. It is hardly an excellent result but it would be difficult to complain about it either.

There were no problems concerning front or back focus tendencies. The tested Sigma, attached to the D3x and to the D200 always hit the right spot without the necessity of using the microregulation here.

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- Sigma 105 mm f/2.8 EX DG OS HSM Macro
- Pentax smc DA 21 mm f/3.2 AL Limited
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- Olympus M.Zuiko Digital 45 mm f/1.8
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Recommended

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Lens review

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11. Summary

Pros:

- Very good image quality in the frame centre,
- Splendid image quality on the edge of the frame for APS-C/DX and FF,
- Solid casing,
- Excellent chromatic aberration correction,
- Zero distortion,
- Very well-corrected coma,
- Slight astigmatism,
- Vignetting on smaller sensor not bothersome at all,
- Silent and quite accurate autofocus,
- Efficient image stabilization,
- Rich accessory kit (hood, case, tripod collar),
- Three-year long warranty period which can be extended by next two years.

Cons:

- Average work against bright light,
- Slow autofocus.

The summary can be only positive. The tested lens has a lot of serious advantages. The good quality of the image, kept on the same level across the frame, even near the maximum relative aperture, is especially worth your attention. Of course you shouldn't forget about the excellent correction of coma, distortion or chromatic aberration. If you add good build quality to that, a long guarantee period and a rich accessory kit it really would be difficult to complain, especially that the disadvantages, listed by us, are of lesser calibre than most of advantages.

However the price, reaching 1100 $, is quite another matter. Even taking into account the fact that it is a novelty on the market and it might go down in the future, it would be difficult to count on a price tag lower than 1000 $. From some time now the Sigma company has been giving a clear message that their products shouldn't be considered any longer just cheaper substitutes of other brand name lenses but rather their fully-fledged rivals from the same price and quality segment. Partially it is justified by excellent result of the latest Sigma models, achieved in practice and in tests alike. In the case of the 150 mm OS model the price has been additionally increased because this lens doesn't have any immediate competitors on the market - no other producer features a macro lens with such a focal length in its line-up, not to mention the stabilization which, for the Canon and Nikon reflex cameras' owners, is a serious asset. Just because of it, especially in richer countries, the Sigma 150 mm OS can be a best-seller.

However, the launch of the 105 mm OS model, announced by Sigma not so long ago, will be the real verification of this company's policy. That device, for a change, will face direct and very keen competition; despite that fact Sigma has already announced a price which wouldn't put to shame even a more reputable producer. Fortunately the price and the properties of the 105 mm OS model can be discussed in more detail during its test which, we hope, will be published soon.

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Sample shots

		
Camera: Nikon D3x **Parameters:** 150 mm, f/8.0, exp. 1/60 s, ISO 200 **File:** JPEG, 6048×4032 pix, 8.32 MB	**Camera:** Nikon D3x **Parameters:** 150 mm, f/16.0, exp. 1/15 s, ISO 200 **File:** JPEG, 6048×4032 pix, 7 MB	**Camera:** Nikon D3x **Parameters:** 150 mm, f/11.0, exp. 1/50 s, ISO 200 **File:** JPEG, 6048×4032 pix, 7.01 MB
		
Camera: Nikon D3x **Parameters:** 150 mm, f/11.0, exp. 1/50 s, ISO 200 **File:** JPEG, 6048×4032 pix, 8.13 MB	**Camera:** Nikon D3x **Parameters:** 150 mm, f/9.0, exp. 1/50 s, ISO 200 **File:** JPEG, 6048×4032 pix, 5.71 MB	**Camera:** Nikon D3x **Parameters:** 150 mm, f/13.0, exp. 1/30 s, ISO 200 **File:** JPEG, 6048×4032 pix, 5.88 MB
		
Camera: Nikon D3x **Parameters:** 150 mm, f/5.6, exp. 1/80 s, ISO 200 **File:** JPEG, 6048×4032 pix, 6.56 MB	**Camera:** Nikon D3x **Parameters:** 150 mm, f/16.0, exp. 1/13 s, ISO 200 **File:** JPEG, 6048×4032 pix, 6.93 MB	**Camera:** Nikon D3x **Parameters:** 150 mm, f/11.0, exp. 1/20 s, ISO 200 **File:** JPEG, 6048×4032 pix, 6.13 MB
		
Camera: Nikon D3x **Parameters:** 150 mm, f/5.6, exp. 1/800 s, ISO 400 **File:** JPEG, 6048×4032 pix, 8.87 MB	**Camera:** Nikon D3x **Parameters:** 150 mm, f/8.0, exp. 1/200 s, ISO 400 **File:** JPEG, 6048×4032 pix, 8.1 MB	**Camera:** Nikon D3x **Parameters:** 150 mm, f/11.0, exp. 1/200 s, ISO 400 **File:** JPEG, 6048×4032 pix, 8.71 MB
		

Camera: Nikon D3x **Parameters:** 150 mm, f/2.8, exp. 1/1600 s, ISO 100 **File:** JPEG, 6048×4032 pix, 9.84 MB	**Camera:** Nikon D3x **Parameters:** 150 mm, f/5.6, exp. 1/400 s, ISO 100 **File:** JPEG, 6048×4032 pix, 10.79 MB	**Camera:** Nikon D3x **Parameters:** 150 mm, f/2.8, exp. 1/1000 s, ISO 100 **File:** JPEG, 6048×4032 pix, 7.25 MB
		
Camera: Nikon D3x **Parameters:** 150 mm, f/4.0, exp. 1/640 s, ISO 100 **File:** JPEG, 6048×4032 pix, 7.39 MB	**Camera:** Nikon D3x **Parameters:** 150 mm, f/4.0, exp. 1/1000 s, ISO 100 **File:** JPEG, 6048×4032 pix, 8.38 MB	**Camera:** Nikon D3x **Parameters:** 150 mm, f/2.8, exp. 1/2500 s, ISO 100 **File:** JPEG, 6048×4032 pix, 8.79 MB

« Previous chapter | Next chapter »

Chapters