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Wednesday, July 17, 2013 at 7:00 AM

Why ISO Can't Hit 100

By Mark

I know I promised a column this week on Raw files and how to use them, but I just can't. Because I just spent the last two days with a camera that gives me the best image of ISO 100 I've ever seen and I can't wait to explain what ISO is really all about before I do that. Bear with me.

The Nikon D4 is a great camera.

Photographers have the idea that ISO (whether analog or digital) is a measure of how sensitive the film or sensor is to light. Digital Camera reports ISO every 35 mm. or sensor. It's an arbitrary idea that ISO, digital or film, is a measure of how sensitive the film or sensor is to light. Film is sensitive to light because it is the silver halide compound of crystals. Digital is a grid of sensors. Each is a pixel. Pixel is a pixel. Sensor is a pixel. Film is a pixel. Pixel is a pixel. Pixel is a pixel. Pixel

photography. As Nick said above, I think a lot of the guts of it is already written here in many of your columns though that doesn't mean that I think it wouldn't involve some more work.

So, Mike could consider starting the TOP Press and taking pre-orders to fund your time while completing the book. I, for one, would happily be prepared to contribute now for the promise of a book in the future, tomorrow preferably but next year would be fine.

(Just joking about tomorrow. I remember how long it once took me to co-write a paper for a technical journal and re-edit following the peer panel reviewer comments. Writing is not a quick or easy task and I appreciate the time and effort which go into columns like yours).

Posted by: David Aiken | Wednesday, 26 September 2012 at 05:26 PM

Kodak really did double their film speeds when Tri-X went from ASA 200 to ASA 400, the claimed removal of the safety factor was a ruse to throw off the competition. See: http://www.apug.org/forums/forum205/39398-how-did-speed-jump-old-films.html

Of course, DuPont, Ansco, Ilford, Agfa, and all the rest surely analyzed Kodak's new ASA 400 Tri-X, and realized there was a real difference.

Posted by: John Shriver | Wednesday, 26 September 2012 at 06:09 PM

If you are really bored you can search on the Oly dpr forum for threads concerning the E30 and E620, which had about one stop sensor/camera difference starting at iso 200. Cameras before these had close sensor/ camera iso's. The threads go on forever. Some folks were angry at the degradation of shadow detail. DPR was very impressed with the improved highlight control, especially on the 620. Anyway, the argument has died away mostly thanks to the much improved OMD sensor (except that it still seems to enrage a few folks who think Oly is somehow lying to consumers).

Posted by: John Krumm | Wednesday, 26 September 2012 at 07:02 PM

Dear John,

If Ron Mowry says it, it must be true.

Seriously. This is the guy I go to when I have technical film questions. Well, him and Dick Dickerson and Sylvia Zawadski. Between the three of them, they know everything there is to be known about emulsions.

Thanks for the corrected information, much appreciated!

pax / Ctein

Posted by: ctein | Wednesday, 26 September 2012 at 07:12 PM

Of course ISO isn't ISO. It's ASA!

Posted by: John Wintheiser | Wednesday, 26 September 2012 at 07:41 PM

I own the GH1+20mm and taking pictures of my family indoors I prefer to use 1/80s which sometimes means ISO 3200. Naturally I'd like to know if the E-M5 would give me better image quality under the same conditions (same lens, same shutter speed).

It seems both cameras would require different ISO settings to achieve the same exposure, so comparing online samples at the same ISO is somewhat meaningless. Which I think is the reason people get upset about it.

So, If I want to know if the E-M5 has, lets say "better low light performance" than the GH1, is it possible to tell without trying the camera first? What numbers/ratings should I look at?

(I hope that makes sense, photography is not my main hobby)

Posted by: Mart | Wednesday, 26 September 2012 at 08:13 PM

Dear Mart,

If two different cameras are doing their metering the same way (a big if) and if they have both been properly calibrated, they will give the same exposures to the same scene at the same camera-set ISO.

Give or take half a stop, in reality.

Equipment just isn't all that accurate.

Metering's a big if. Multi-segment smart metering varies the exposure compensation from scene to scene, to try to give the most satisfactory results. Every company has its own proprietary schemes for doing this. So, Camera A might look at a backlit scene and open up by 0.5 stop and Camera B might look at the same scene and open up by a full stop. But that's not an ISO problem.

So, yeah, there's no reason you shouldn't be able to compare online photos made at the same ISO, as much as you can ever compare photos.

pax / Ctein

Posted by: ctein | Wednesday, 26 September 2012 at 11:29 PM

A huge thanks to John Shriver for is link. This is a major breakthrough for me at least.

It seems that the key notion that emerges here is the SAFETY FACTOR. This is a concrete concept that should be made operative.

This project will allow us to better control of our gear in the field (Sur le motif magnificently said Paul Cezanne, a forgotten photographer from the pre-digital era), which is much more important than changing hardware every 6 months.

Ctein Be our AA, our Fred Picker, our Phil Davis and give us the BTZS of the digital era.

Posted by: jean-louis salvignol | Thursday, 27 September 2012 at 01:10 AM

Dear Ash,

Oops, sentence should have read, "An "objective" ISO is in no way better than a "SUBJECTIVE" one.

My bad.

pax / Ctein

Posted by: ctein | Thursday, 27 September 2012 at 02:26 AM

Mart, it is possible to work it out from the combination of DXOmark data and DPreview information.

One thing that dpreview does test is what they call ISO accuracy. In fact what they are measuring is how the metering system is calibrated. Fortunately, this lets us see how similarly two cameras, with the same lens (and therefore light transmission) will meter the same scene.

In your case, they report that the EM-5 meters to ~1/3 stop darker than a light meter would indicate, and the GH1 is probably similar (couldn't find it).

What I'd then do is take the DXOmark data for screen level 18%SNR for each iso, and compare them, not as DXOmark does at their tested ISO, but at the manufacture stated iso (-1/3 stop for the EM-5) to see which gives a higher SNR. You can do the same for dynamic range. This should tell you which will be less noisy given a particular scene and lens.

Oh how I wish dxomark gave you the option to plot their results vs stated ISO rather than their measured ISO. Would be soooo much better for camera comparison!

Posted by: Richard Cowan | Thursday, 27 September 2012 at 02:24 AM

So, If I want to know if the E-M5 has, lets say "better low light performance" than the GH1, is it possible to tell without trying the camera first?

Mart: it is better to accept that any statement containing the word "better" has no definitive meaning (grin). Sorry, but let's get that out of the way.

The same applies for the "low light performance" part of the query. This describes a very different mix of qualities, for different people, depending on what assumptions they are making, and on how they are judging the outcomes.

You can get a good indication about this by reading several professionally done reviews, or user reviews, from end to end, with your own requirements and circumstances borne always in mind. That's all.

Because no single technical number will be able to express such an ill-defined thing; to take an analogy, no single measurement can sensibly express "human physical performance". How applicable could that be to any given case? Say, if person A has the ability to run well, but cannot see. And person B has lots of muscle strength but no stamina. We'd need to know all about those things each time, in order to evaluate just how misleading the standard test was each time.

Even if there *were* consensus that some technical test of photography in low light conditions was conclusive (hollow laugh), that is still just one item of disconnected evidence.

Posted by: richardplondon | Thursday, 27 September 2012 at 02:47 AM

Wow, I did not know this.

I think this may explain in part why I am so pleased with the performance of my small sensor cameras (FZ150, G12), when DXOMark gives them comparatively low ratings.

As a fulltime freelance writer who often shoots photos to illustrate his stories, I tried to research and absorb a lot of the theory of digital cameras before making buying decisions. Your columns have been very useful and illuminating.

So I will underscore what others have said: you should write a book. To avoid the high cost of getting from silicon to paper, you could self-publish as PDF files on a CD ROM and sell direct. That would keep the cost of goods low, and you could publish on an "as needed" basis.

(That's what I did with my book "Elliott on Airguns" and the strategy worked -- I did not have to go into the hole thousands of dollars in the hope that the resultant pile of printed books would eventually sell.)

Of course, if a publisher wants to give your a juicy advance . . . all the better!

Still, I think your book would sell, even if the market might be small. But if you keep the production costs low, it could be a successful -- and well received -- venture.

Posted by: Jock Elliott | Thursday, 27 September 2012 at 05:17 AM

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