KolariVision Ultra-Thin (UT) Sensor Cover,[1]
Sony a7rii, & Leica M Lenses

www.PaulRoark.com
8/2018

Summary

This PDF reviews the performance of the Ultra-Thin ("UT") sensor cover glass/IR filter on the Sony a7rii. For those who want the best image quality from a compact "full frame 35mm" this makes a very good approach. With an appropriate selection of Leica M lenses, the best compact, manual focus optics can, indeed, be mated successfully to the best compact "full frame" 35mm digital camera. Leica M glass combined with the Sony 42 mp sensor, modified with the KolariVision UT cover-glass, results in the best image quality for the weight and size of equipment that I have experienced.

First, the **bad news**:

With the OEM, thick Sony cover glass, the edges are so bad with many Leica M wide angles that they are simply unusable. Even 50mm Leica M lens performance on the OEM Sony is marginal. The cover-glass is, in effect, part of the optical formula. The Leica M lenses are (now) made for a very thin cover-glass. The KolariVision UT glass meets this criteria. The stock/OEM Sony cover glass does not; it's too thick.

Note that even the Ultra Thin cover-glass is too thick for older Leica M wide angle lenses that were designed for film cameras. Older Leica M wide angle lenses with very obtuse ray angles at the "film plane" will have curvature of field and softness in the corners, particularly at apertures wider than f/8; similar to what is seen on the Leica M9. There are also color artifacts similar to what we saw on the M9 with some very wide, relatively symmetrically designed lenses. These color defects and vignetting may even be slightly worse than on the M9.

The **good news**:

There are many Leica M optics that work exceptionally well with the Sony and the KolariVision UT filter. While the traditional, older wide angle lenses made for film cameras can be problematic, the modern lenses made for digital cameras work very well. The relatively new 28mm f/2, for example, is simply exceptional on the Sony a7rii with the UT filter modification.

The degree of image edge sharpness degradation with older Leica M wide angles and the UT cover-glass is usually in same league as the M9's. The rest of the image, however, is noticeably sharper. Obviously the higher megapixel count of the Sony is a major part of the non-edge image advantage.

The bottom line is that the UT-modified Sony a7rii, in general, allows the use many of the excellent, newer Leica M wide angle lenses with the state of the art digital sensors from Sony.

Note that once the UT filter is installed, the OEM Sony lenses will not perform as well as they do with the OEM cover-glass. So, one has to make a decision as to which lens platform to support.

Happily, most M-mount wide angles that I have tested do not have a significant color artifact issue. Where I have seen them, for example with the older 28mm f/2.8 lens, Cornerfix works reasonably well (via Adobe DNG converter), solving most of the problems.

The UT IR filter has a bit of an extended red sensitivity, but not as much as the astrophotography filter from KolariVision. The total cutoff point is 700 nm. The extended red sensitivity, for my black and white, is a good thing. It acts like a very light red filter that will enhance the cloud/blue sky contrast and favor the red channel in terms of exposure. Although I am not a professional color profiler, it appears the image taken with the UT cover glass will be able to be profiled for good color.

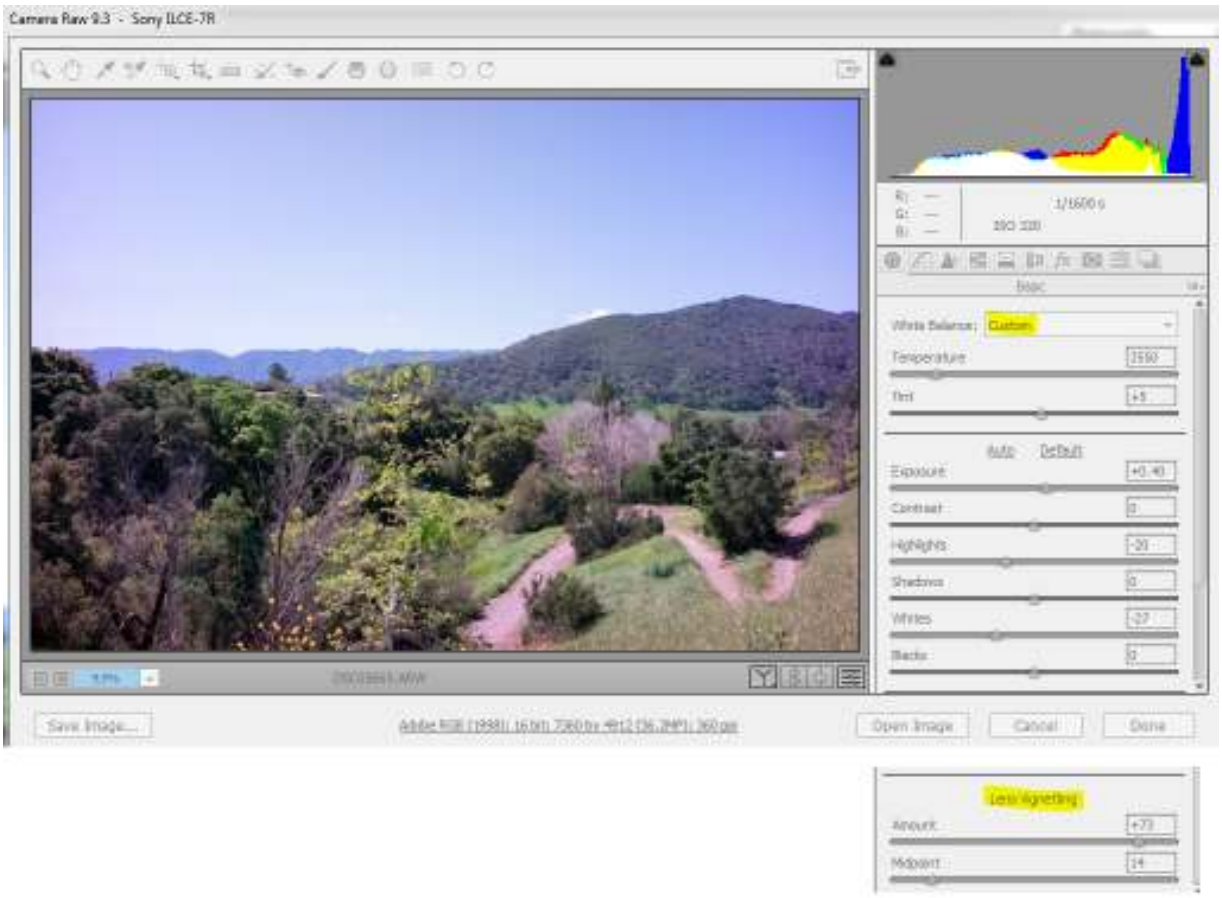
[1] See https://kolarivision.com/product/sony-a7-series-thin-filter-legacy-lens-upgrade/ ; there are two options, one for the Ultra-Thin filter.

The ZM 21mm f/4.5 Compact Biogon is still not recommended. Its extreme ray angle is still an issue. In general the more compact, symmetrical designed super-wides will show the most vignetting as well as color artifacts. The newer Leica M wide angles appear to have been modified to have less obtuse ray angles on the sensor, making them the most compatible with the UT cover glass on the Sony as well as the standard M9 cover glass.

The **28mm f/2.8 Elmarit-M ASPH** is Leica's most compact (serious) lens.[2] That may also make it one the most difficult lenses to use on the Sony. I do not recommend it. Stay with lenses that have relatively perpendicular ray angles on the sensor.

In this regard, the new **28mm f/2 Summicron** is a stellar performer. So, for those who are able to upgrade to this newer generation of optics, this entire issue and need to use Cornerfix[3] to correct color artifacts are moot issues.

For older wide angle lenses the **color artifacts** can be significant, particularly with the a7r (v.1). Below is a screen grab of an image taken at **f/8** with the older Leica **28mm f/2.8 Elmarit-M ASPH**. It shows the color artifacts that color shooters will have to find a way to deal with if they want to pursue this option. The ACR adjustments I made to this image are shown in the screen grab, below.



[2] Leica recently announced the production of a 28mm f/5.6 "retro" type lens. It's extremely compact, but not a serious contender for high end photography. Likewise, I have one of the Leica 50mm f/2.8 Elmar collapsible lenses. It's very compact and capable of serious work at f/8. However, while it may be the best 50mm tessar ever made, it's not serious competition for a modern double gauss design like the f/2 Summicron or Zeiss ZM.

[3] See https://sites.google.com/site/cornerfix/

Not all wide angle lenses are going to work well on the Sony even with the UT cover glass and Sony a7r. The ZM 21mm f/4.5 C-Biogon, for example, has severe vignetting. While one might be able to lighten the edges enough, they are so under exposed that the noise level would probably be unacceptable for me. My attempt to use the Cornefix solution did not produce good results. While some think that 21mm f/4.5 is a great lens, I found it barely acceptable on my M9, and its worse vignetting on the Sony pushes it over the edge for me on the Sony platform. It is the only M-mount wide angle that I have that I'd put into this "unacceptable" category.

For most of my landscape work, I prefer a stitched panorama, using the cylindrical stitching option. This avoids the ultra-wide rectilinear, stretched corners, which I consider an undesirable distortion at the super-wide end. As such, I'll use my 28mm in a panning mode rather than a wider lens.

Note that for super-wide, the 16-18-21 mm Tri-Elmar works very well on the Sony, particularly with the UT filter modification.

If one just looks at the published MTF curves, one of the best wide angle lenses I have is the 24mm f/3.8 Elmar-M. In testing, however, the the corners do not hold up as well as the MTF curves suggest at wider apertures. At f/8, however, the Elmar-M 24mm does become outstanding across the field. The Elmar-M 24mm on the Sony has edge sharpness about like on the M9. Interestingly, it has very little problem with color artifacts.

VM-E Adapter

An important component in the use of Leica M-mount optics on the Sony a7rii is the Voigtlander VM-E close focusing, adjustable adapter ($309).[4] This allows each lens to have a correctly set infinity focus stop. In the field, I believe this is the most practical way to handle, in particular, my style of 2-shot zone focusing. I routinely focus on the close subject, take it and immediately refocus to the infinity stop and take a second shot. I can't take my eye from the scene or mess with looking at sluggish focus scales on an AF Sony lens. The alignment of the two shots will drift too much. So, a correctly set infinity stop is critical for me. This adapter allows that.

Interestingly, each wide angle may have a different optimal setting on the adapter. Their ray angles are different, and every angle is affected to a different degree by the cover glass. Leica seems to be making its newer wide angles for digital cameras in a manner that make them much more consistent in how the VM-E is set for correct infinity stop. With the two optics I carry the most -- 75mm f/2.5 and 28mm f/2 -- the setting of the VM-E is the same. Very convenient.

Because some lenses require different VM-E settings, what I have done is place a type of scale on the adapter, each line being 1 mm apart. The first line at the left is at the fixed stop of the adapter; the center line is an early average and a good, easy point of reference. I also put on each lens the setting that works best. A photo of my Sony a7r with the 28mm Elmarit (with lens shade/hood) is shown below with these calibration scales on the adapter and on the lens shade. With my current setup using the 75mm and 28 f/2, the VM-E simply is taped to stay put at +3/4 (relative to the center line of the scale).

[4] See https://www.bhphotovideo.com/c/product/1022002-REG/voigtlander_bd272a_vm_e_close_focus_adapter.html

Summary

If weight and size are not issues, of course, very good wide angle performance across the field even at f/1.4 can be achieved on many platforms. The Otus, below, is an example (but I have not actually tested one). For those who want compact and lightweight systems, however, the KolariVision Ultra-Thin cover-glass on the Sony a7rii, used with the best Leica M-mount or Zeiss ZM optics offers an interesting and perhaps unique choice. I know which one I'll be hiking and traveling with.