

glass candy



With high-end digital motion-picture cameras being cycled far more frequently, the window on getting a good return on your big investment is becoming increasingly short for cinematographers and filmmakers. With this in mind, having a good set of prime lenses or an all-purpose cine zoom might be a better bet. And now with 4K becoming the dominant capture format, you're going to need high-quality glass that can resolve 4K or even 6K resolution.

Although it's possible to use DSLR lenses for your movie (especially for shoestring budgets), it's definitely not advisable to use them on a feature film, especially when working with a full camera crew. Cine lenses are constructed much differently than still lenses in regard to body style, markings and internal mechanisms for focus and iris changes. (Trying to hit focus marks with consistency on a still lens with a small lens barrel is a very difficult skill set to master.) And although cine lenses

cost significantly more than still lenses, in the long run, they will give you a much bigger window to recoup your investment if you rent your gear.

Here are some of the latest prime and zoom lenses specifically designed for cinema production for both professional and indie filmmakers.

THE PRIMES

As you know, Canon (www.usa.canon.com) has jumped into the professional cinematography market with the release of professional large-sensor cameras like the C300 and C500. And one of the big reasons behind the Cinema EOS push is its high-quality optics. I recently had the chance to visit Canon's largest optical manufacturing plant in Utsunomiya, Japan. It was amazing to see up close how lenses are cut, ground, polished and coated.

With over 80 million EF lenses in the world, Canon has a

scale that image down to something less. The more resolution you have for viewing, the better your chances to maintain focus.

Field monitors (or viewfinders) may have focus-assist features. One feature is peaking, an image-processing system that creates an electronic overlay on the image that highlights parts of the scene that appear sharp. Another feature might be the ability to zoom in on a part of the scene to set focus. Or, if the monitor isn't full HD resolution, it might show you, pixel for pixel, a portion of the image, which will remove any scaling artifacts that might distract from critical focus.

Since you talk about measuring distances, I should point out one other fact about depth of field—it isn't exactly equidistant from the focus point. Or more to the point, there's a forward portion and a rearward portion.

Let's say you're shooting a group of people with a 35mm full-frame SLR. They're standing immediately behind a railing that's at a distance of 20 feet. The lens you're using is a 40mm at an aperture of $f/2$. Although the people are standing and they might be moving in and out of

"As the sensor size gets larger, the focal length has to be increased to capture the same angle of view."

that 20-foot distance, since there's a railing, they won't be moving any closer. At first, you might think to set your focus distance to 20 feet and start shooting. But if you do the calculation on depth of field (40mm at $f/2$, full-frame SLR), you'd get a total depth of 9.58 feet. If you assume the depth-of-field range is equidistant, you'd divide 9.58 in half (4.79) and guess that objects that are up to 4.79 feet in front of the railing would be in focus and people in the group that are 4.79 feet behind the railing would also be in focus. But since no one will be in front of the railing, you might set your focus point at 24.79. This would mean that the people at the front of the railing would still be in focus, and the rest of the focus range would be used to keep people in the back more in focus.

But depth of field isn't equidistant like that. In the situation above, 3.7 feet in front of your focus point is in focus and

5.88 feet in back. So instead of setting focus at 24.79, you'd set it closer to 23.7.

This is just one example. If you're in the middle of a shoot and things are happening fast and furious, it might not be practical, but you can try out various scenarios using depth-of-field calculators either online or in an app. (A useful one is www.dofmaster.com/dofjs.html.)

One last suggestion is to think about how narrow the depth of field really needs to be. Obviously, it's a creative choice, but in the case above, if you closed down one stop, you'd more than double the depth of field and have a much better chance of keeping focus.

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Send in your video production technical questions to videoassist@hdvideopro.com or mail them to Video Assist, HDVideoPro Magazine, 12121 Wilshire Blvd., Ste. 1200, Los Angeles, CA 90025.

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The latest prime and zoom lenses for cinema production

BY NEIL MATSUMOTO



significant advantage over other lens manufacturers regarding volume. And although they have a number of cinema zoom lenses, including a 14.5-60mm, a 30-300mm, a compact 15.5-47mm and a 30-105mm, it's their cinema prime lenses that many indie filmmakers are gravitating to. The Cinema EOS Prime lenses can resolve 4K resolution and are offered in six models, including 14mm T3.1, 24mm T1.5, 35mm T1.5, 50mm T1.3, 85mm T1.3 and 135mm T2.2. The lenses contain an 11-blade aperture diaphragm, and unlike their EF still lenses, the Cinema EOS primes have consistent form factors and markings so film crews can easily adapt to them. Speaking of the EF mount, unlike the Cinema EOS zooms, which are offered in either EF or PL mount, the Cinema EOS primes are only offered as an EF mount. This was certainly a risky move for Canon to take, but with a price point of approximately \$4,970 (with a \$250 Canon rebate), these are perhaps the most affordable high-end glass on the market. It's no wonder why DSLR users are graduating to Cinema EOS in large numbers.

For over 60 years, Panavision (www.panavision.com) has been producing some of the finest cameras and lenses in the production industry. Although their camera division has been hit hard as a result of 35mm film's decline, their Primo lenses remain the "gold standard" for cinematographers, who love the look of their rich contrast range and even field illumination, as well as the lack of glare, ghosting and distortion.

Panavision has recently announced the Primo V series, which are designed to be used with 35mm digital cameras, but still offer the look and feel of the original Primo glass. Digital motion-picture cameras usually have low-pass and IR filters that will cause more off-axis aberrations, and the new Primo V lenses are reengineered to combat this. With patent-pending modifications, Panavision has greatly reduced the coma, astigmatism and other aberrations that exist as the result from the added glass between the lens and sensor. Because of this, the image will look more balanced from the center to the outer edges. The lenses are compatible with PL- or Panavision 35-mount cameras and aren't designed for film cameras. But because they're designed to have the same characteristics of the original Primos, the V series will still blend well with Primo-shot film. A full set contains 14.5mm, 17.5mm, 21mm, 27mm, 35mm, 40mm, 50mm, 75mm and 100mm focal lengths. (Pricing isn't available at this time.)

Band Pro Film & Digital, Inc. (www.bandpro.com) recently started shipping the new Leica Summicron-C lenses, manufactured by CW Sondersoptik (who also manufactures the Leica Summilux-C lenses). The Summicrons are a more budget-friendly series than the Summilux and offer six lenses at 18mm, 25mm, 35mm, 50mm, 75mm and 100mm focal lengths, each at T2.0 (compared to the Summilux-Cs' T1.4). There will be a 21mm, 29mm, 40mm and 156mm in the near future.

The lenses contain a stainless-steel PL mount and are similar to



OPPOSITE: The Leica Summicron-C prime lenses are able to cover the 6K DRAGON sensor. TOP: The Schneider Cine-Xenar III prime lenses offer both speed and solid construction. MIDDLE: Canon's Cinema EOS Prime lenses have become popular with indie shooters. ABOVE: Panavision's new Primo V series is specifically designed for digital cinema.



LEFT AND BELOW: The Zeiss CZ.2 15-30mm and 70-200mm zooms are both T2.9 and positioned to be companions to Ultra Prime lenses. BOTTOM: The Angénieux Optimo DP 25-250mm has a 10x zoom range and weighs only 16 pounds.



the Summilux in terms of focus and iris gears, but have slightly different sizes and weights. (The 135mm, in particular, has a front-to-flange length of 118mm compared to 101mm on the others.) Also, the Summicron-C lenses have helical focus mechanisms.

With the release of the 6K RED DRAGON, there are many lenses that won't cover the entire sensor. The Summicron-Cs have an image circle at roughly 34mm, so they should have you covered while shooting in the DRAGON's 6K mode.

The total cost of the Summicron-C series is \$97,500, which is approximately \$16,250 per lens—pricey to most, but inexpensive compared to its bigger brother (roughly \$24,750 per lens). You have to remember that these are Leicas, and that little red dot comes at a premium. But if your budget will allow, Leicas are the Rolls-Royce of glass.

Manufactured in Germany by Schneider-Kreuznach, the Schneider Cine-Xenar III prime lenses (www.schneideroptics.com) are built specifically for digital cinema. With up to 18 iris blades, the lenses have the speed and solid construction that provide excellent image quality and brightness, as well as minimal breathing. The series includes 18mm, 25mm, 35mm, 50mm, 75mm and 95mm lenses, and all have the same dimensions and focus and iris gears in the same position for your camera assistant. With the exception of the 35mm, which has a T2.1 aperture, the lenses all contain a T2.2 aperture. For a full lens set, the MSRP is \$48,410. Individually, the lenses are \$7,750, with the exception of the 18mm, which sells for \$9,660.

THE ZOOMS

Zeiss (www.zeiss.com) changed the indie film world with the release of its CP.2 prime lens series with an interchangeable-mount system. Now, Zeiss looks to transform the zoom lens marketplace with the release of its CZ.2 lenses, which are lightweight and compact zooms that also offer an interchangeable-mount system (PL, EF, F, MFT, E). The three CZ.2 zoom lenses—a 15-30mm (\$23,900 MSRP), a 70-200mm (\$19,900 MSRP) and a 28-80mm (\$19,900 MSRP)—are all T2.9 and are color-matched to Zeiss prime lenses, as well. According to Carl Zeiss National Sales Manager Richard Schleuning, Zeiss is positioning the CZ.2 lenses to be companions to its Ultra Prime lens series.

Also, according to Schleuning, the zooms are 4K-capable and the only cine zooms to cover a 24x36mm sensor size. Therefore, there are no issues with the RED DRAGON sensor. For





making it a true switch-hitter. At IBC 2013, Fujinon introduced the PL-mount 14-35mm Cabrio wide-angle lens, which is 4K-capable, has 200° focus rotation and supports the LDS (Lens Data System) and /i metadata format. When you detach the digital servo drive, the Cabrio 14-35mm has industry-standard cine motors that can be used. The lens is also lightweight enough to use handheld to capture wide-angle shots in tight spaces. The image circle will cover the DRAGON sensor in 16:9 mode, although in full 6K mode, you may experience vignetting at the widest end. The suggested retail price for the 14-35mm is \$42,000.

Angénieux (www.angenieux.com) has created some of the most versatile zoom lenses in the industry, and the Optimo DP series of zoom lenses has been popular with digital shooters. The company has recently released a third option in the series, the Optimo DP 25-250mm, which will make it perhaps the most versatile zoom yet, with a 10x zoom range. Even with this long focal range, the 25-250mm only weighs 16 pounds, contains a front diameter of 136mm and a close focus of 4 feet. With an image circle of 31.4mm (diagonal), the lens is well suited for Super 35mm-sized sensors and should cover the DRAGON sensor and all formats below 6K. Like other cine zooms, the 25-250mm's body contains precise focus marks with an interchangeable feet-to-meters focus scale ring. In terms of speed, the long zoom opens at T3.5 and is constant throughout the focal range. What also separates the Optimo DP zooms is that they employ /i Technology for metadata capture. If you need even more telephoto range, the lenses can be used with 1.4x and 2x extenders. The MSRP for the 25-250mm is \$49,500. HDVP

cinema-style zooms, the CZ.2s are fairly lightweight, ranging from 5.5 to 6.2 pounds and no longer than 10 inches in length. Reasons why you should go with a CZ.2 zoom over a standard photo zoom is because of its cinema-style housing (lets you use a follow-focus system), longer focus throw, easier-to-read markings and no issues with zoom or focus shift when changing focal range. But perhaps the main reason for the CZ.2s would be their interchangeable mounts, which are fairly easy to change.

With its Cabrio line of zoom lenses (PL 19-90mm and PL 85-300mm), Fujinon (www.fujinon.com) holds a unique advantage in the professional optics market. Its "killer app" is a detachable digital servo drive. With this feature, the Cabrio can function as both a self-contained ENG-style lens or a cine lens,

Going Mod

Duclos Lenses can make your DSLR lenses cine-ready

By Neil Matsumoto

Cine lenses are essential for professional productions, but in reality, most indie filmmakers can't afford to buy, or even rent, a full set of cine prime lenses or zooms. Plus, if you're shooting a movie with a DSLR, is it really worth buying one prime lens that can cost up to triple the amount of your camera body?

Lucky for us, there are several options for low-budget filmmakers who want more manual-focus control. And one of the main keys for working with DSLR lenses is having a larger lens barrel that will deliver a longer focus throw.

California-based Duclos Lenses (www.ducloslenses.com) provides high-end motion-picture lenses, as well as service and repair. One of its most popular services is Cine-Mod, a modification process that takes still lenses and makes them more cine-friendly. The process takes approximately one week and includes a seamless focus gear, an 80mm front ring with 77mm filter threads (for mounting accessories), and de-clicked,



damped aperture movement. A full Cine-Mod is \$250 per lens, but you can also just order individual modifications to lower the cost.

Duclos (pronounced "duke-low") has also converted (and sells) a wide-angle zoom. Manufactured by Tokina and available in Canon EF and Nikon F mounts, the 11-16mm zoom has been modified with black anodized aluminum, and the internal components have been refined and reinforced. Duclos has calibrated the optics for better axial alignment, as well. The lens sells for \$3,495.