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Art, Technique, and Technology in Motion Picture Production Worldwide



Angenieux Type EZ Zoom Lens
Special Report

Cover: Steadicam Operator Aline Ballestero with Angenieux Type EZ-2 Full Frame 45-135mm T3 Zoom.
Photo by Yasuhiko Mikami.

Angénieux Goes Full Frame Easily



Angénieux Type EZ-1 in FF format with PL Mount

Angénieux Type EZ-1 in S35 format with PL Mount



Here are two new, convertible, compact zooms from Thales Angénieux. They cover both Super35 and Full Frame/VistaVision. Their small size and light weight seem to defy physics. (Aren't Full Frame lenses supposed to be at least 1.5 to 2 times the size and weight of their S35 counterparts? Not these.) The price defies tradition. This is a new paradigm for Angénieux: an affordable zoom lens filling the gap between the DSLR and Cinema lenses for the growing corporate, documentary and owner-operator markets.

At IBC, Angénieux debuts the first two models. Type EZ-1 is a standard 3x zoom. Type EZ-2 is a wide-angle 2.7x zoom. Both lenses have exchangeable rear lens groups and hence the ability to be swapped between Super35mm format (up to 30mm image diagonal) and Full Frame/VistaVision (up to 46mm image diagonal).

The Angénieux EZ-1 covers a standard zoom range. It is slightly longer than a classic Angénieux Optimo 28-76 or Style 30-76. With the Super35 Rear Group attached, the EZ-1 is a 30-90mm T2 zoom. With the FF Rear Lens Group, it is a 45-135mm T3 zoom.

The Angénieux EZ-2 covers wide angles. It is just a little bit longer than a classic Angénieux Optimo 15-40. When configured for Super 35, it is a 15-40mm T2 zoom. Configured for FF/VV, it becomes a 22-60mm T3 zoom.

How can they do this? Angénieux has been building zoom lenses for 60 years—since 1956. They have a great deal of optical and mechanical design experience making compact and lightweight lenses. The concept of interchangeable rear groups is not new at Angénieux. The 44-440 T4.5 Anamorphic Zoom introduced in April 2016 has been a great success with rental companies because of its high quality and interchangeable rear group that can be swapped to convert it to a 25-250 T3.5 Optimo Style Spherical zoom.

In 2012, Angénieux introduced the 19.5-94 T2.6 and 28-340 T3.2 with 31.4mm image diagonal coverage. These zooms featured not

only new rear groups but also a redesign of the ever-popular 24-290 T2.8 and 17-80 T2.2 which had smaller image diagonals.

The technology of “speed boost” by reducing image coverage is at work in the new EZ series. Apertures normally unheard of in a Super 35 zoom lens are achieved: T2.0. Actually, apertures unheard of in a Full Frame / VV zoom are also achieved: T3.0 — in a size and weight that leaves us astonished.

Both lenses have a full metal mechanical barrel, with internal thermal drift compensation. In other words, your focus remains constant as temperatures on location fluctuate. You may have to shed layers of clothing as the thermometer rises, but the lens maintains its parameters.

Focus, iris, and zoom rings have familiar wide rotation and industry-standard 0.8M gear teeth. The lens length remains constant because focus and zoom mechanisms are internal. You can configure the lenses for S35 and FF/VV formats by swapping the rear group yourself. EZ Zooms come with PL mounts and you can attach EF or E mounts without returning the lens to a service center.

“It is important for Angénieux to address the ever-growing market of affordable digital motion picture cameras,” said Pierre Andurand, CEO of Thales Angénieux. “The challenge is to provide a cost-efficient, professional quality lens that can be used on current S35 cameras, as well as on future cameras that will be built around larger image sensors.”

EZ-1 deliveries are expected in the 1st quarter of 2017. EZ-2 should deliver in the 2nd quarter of 2017. Band Pro is the distributor in the Americas, Jebesen in Asia/Pacific, Angénieux France in Europe and rest of the world, and there will be a network of resellers. Prototype lenses will be shown at IBC 2016 in the Thales Angénieux and Band Pro booths.

angenieux.com bandpro.com jebesenindustrial.com

Angénieux Type EZ Zoom Comparisons

EZ-1 S35 30-90



Type EZ-1 Super35
30-90mm T2
Zoom Ratio: 3x
Image Diagonal: 30mm
Aperture: T2.0 - 22
MOD: 0.6m / 2'
Front Diam: 114mm
Length: 226 mm / 8.9"
Wgt: 2.15 kg / 4.7 lb

EZ-1 FF 45-135



Type EZ-1 FF / VistaVision
45-135mm T3
Zoom Ratio: 3x
Image Diagonal: 46mm
Aperture: T3.0 - 32
MOD: 0.6m / 2'
Front Diam: 114mm
Length: 226 mm / 8.9"
Wgt: 2.05 kg / 4.5 lb

EZ-2 S35 15-40



Type EZ-2 Super35
15 - 40mm T2
Zoom Ratio: 2.7x
Image Diagonal: 30mm
Aperture: T2.0 - 22
MOD: 0.6m / 2'
Front Diam: 114mm
Length: 210mm / 8.3"
Wgt: 2.12 kg / 4.7 lb

EZ-2 FF 22-60



Type EZ-2 FF / VistaVision
22 - 60mm T3
Zoom Ratio: 2.7x
Image Diagonal: 46mm
Aperture: T3.0 - 32
MOD: 0.6m / 2'
Front Diam: 114mm
Length: 210 mm / 8.3"
Wgt: 2.07 kg / 4.6 lb

Photos in this article and on cover by Yasuhiko Mikami

Angénieux Type EZ Zooms



Angenieux Type EZ-1 S35 E-mount on SONY PXW-FS5

There have been many variations of the 35mm motion picture film format: Silent, Academy, CinemaScope, Techniscope, Super35, VistaVision, and so on. With digital cameras, it seems like the wild West. Camera manufacturers can conjure up almost any format they like. So, what is a lens manufacturer to do? If you're Angenieux, you satisfy all existing permutations of 35mm and future-proof your lenses for any sensor size the camera companies may eventually create.

There is no industry standard for 35mm digital camera sensor dimensions or even lens mount. Each camera model seems to come out with a different sensor size. So-called 35mm sensors can be anything from 22mm to 46mm image diagonal.

Swappable Rear Groups

The new Angenieux EZ Super35 series of zooms have a rear group that accommodates an image circle up to 30mm diagonal, which covers most motion picture cameras recording HDTV and UDTV video, and still cameras based on the APS-C format.

The Angenieux EZ Full Frame rear group has an image circle of 46mm, which covers traditional full frame still photography format of 24 x 36mm (43.3mm diagonal), traditional VistaVision (45mm diagonal), the 8K RED VV 21.60 x 40.96 mm (46.31 diagonal) format, and anything larger than 30mm diagonal.

T-stops

Typically, when you attach a lens on cameras with larger or smaller imagers, the focal length and T-stop remain the same. For example, an Angenieux Optimo 24-290 T2.8 zoom on a 35mm PL camera is the same as on a 16mm PL mount camera. The wide end is always 24mm, and it's always T2.8 wide open. The only difference is that the smaller 16mm format crops the image, and the field of view appears tighter compared to 35mm format.

The Angenieux EZ lenses take a different approach. By adjusting the size of the image circle, the focal length is changed and you get a similar field of view in both S35 and Full Frame. Since the lens is concentrating the image onto the smaller target area of a Super35 sensor, the intensity of light increases.

Product development

The initial design was developed by the Angenieux optical engineering group based in Saint-Héand France. During the course of mechanical design and fine-tuning the overall design for manufacturing, a fair amount of joint development work took place between Angenieux and a prominent engineering/manufacturing partner in Japan.

Manufacturing

To keep them affordable, the lenses are manufactured with a Japanese production partner who works in significantly high volumes and has been fully qualified by Angenieux. This helps to reduce the overall manufacturing cost.

How EZ range is positioned within Angenieux portfolio

The traditional Angenieux Optimo and Optimo Style range are S35 format zooms. Their optical and mechanical performance put them in the high-end of production. The new Type EZ range has been created to fill the gap between DSLR and Cinema lenses, addressing the growing corporate, documentary, video journalist and owner-operator markets. The EZ series was made possible by an optical formula that satisfied the fundamental requirements of both the S35 and Full Frame formats. They offer a compelling balance between quality, size, weight, and most importantly, cost.

Full Frame EZ zooms fit which Full Frame cameras?

The list will grow. As of IBC 2016, EZ FF zooms cover these cine cameras: RED 8K VV, RED cameras recording at resolutions higher than 5.5K, ARRI Alexa Open Gate, ARRI Alexa 65 with Full Frame crop. They also cover Full Frame DSLR cameras, including: SONY a7S Mark II, Canon EOS 5D Mark IV, 5DS, 1D X Mark II, etc.

Purchase S35 or FF or both?

Initially, you'll be faced with an agonizing choice. Which model should you buy? The S35 EZ series are some of the fastest zooms in the industry at a typically prime lens speed: T2. For a few dollars more, you can buy the EZ zoom as a package that includes both the S35 and Full Frame rear lens groups.

Angenieux Type EZ Zooms

Angenieux Type EZ-1 S35
PL mount on ARRI Alexa Mini



Even if you swear never to shoot Full Frame Cine (never say never—it's coming like a freight train) the FF rear group also acts as a 1.5x tele converter. So, the EZ-1 30-90mm T2 S35 lens becomes a 45-135mm T3 lens no matter which format you're in. The EZ-2 15-40mm T2 S35 becomes a 22-60 T3.

With cameras so sensitive, why do we need a T2 zoom lens?

Very shallow depth of field looks great. A zoom lens with such speed is rare, and normally the realm of primes.

Quality compared to a Speed Booster or Image Expander

Aftermarket Speed Boosters attach to the mount of existing still photography lenses and do a similar job of condensing the field of view to S35 with an accompanying gain in speed. Image Expanders take S35 lenses and allow them to cover Full Frame.

However, there are big differences between dedicated cine lenses and most DSLR lenses: quality of the mechanics, ability to maintain focus throughout zoom range, and angle of focus rotation. Type EZ lenses have a wide focus rotation angle of 300 degrees, compared with still lenses that can have as little as 30 degrees of

travel. The rear lens group of the EZ series is dedicated and optimized for each individual lens. Excellent image quality is assured. The matching front and rear groups have the same serial number.

Swapping lens mounts

Changing between PL, EF and E-mount on the EZ is easy. Just unscrew the ring by hand. Checking flange focal distance is advised.

Swapping rear group

Exchanging the S35 and FF rear group is simple and fast, but has to be done in a controlled environment where dust and moisture do not come in contact with the lens. Only standard tools are needed. Checking flange focal distance is advised here again.

Focus, Iris and Zoom scales

Conveniently, the focus scale remains the same for both S35 and FF. The zoom scale for the two different formats is changed by sliding the window in the lens barrel forward or back. The iris scale is part of the rear group.



Angenieux Type EZ-1
Full Frame EF mount
on CANON EOS-5Ds

Angénieux Type EZ Specs

Angénieux Type EZ-1
for Super35
30-90mm T2.0



Angénieux Type EZ-1
for FF / VistaVision
45-135mm T3.0



Lens		Type EZ-2 (WIDE)		Type EZ-1 (STANDARD)	
		S35 3-perf	FF / VistaVision	S35 3-perf	FF / VistaVision
Image Format	Format	S35 3-perf	FF / VistaVision	S35 3-perf	FF / VistaVision
Zoom Range	mm	15 - 40mm	22 - 60mm	30 - 90mm	45 - 135mm
Aperture	T stop	T 2.0 - 22	T 3.0 - 32	T 2.0 - 22	T 3.0 - 32
Image Diagonal	∅ mm	30mm	46mm	30mm	46mm
Reference image size	mm	13.5 x 24	24.9 x 37.7	13.5 x 24	24.9 x 37.7
Zoom Ratio		x 2.7	x 2.7	x 3	x 3
Minimum Object Distance (MOD)	meters	0.6	0.6	0.6	0.6
	feet	2	2	2	2
Front Diameter	mm	114	114	114	114
Lens Length	mm	210	210	226	226
	inches	8.3	8.3	8.9	8.9
Weight	kg	2.12	2.07	2.15	2.05
	lb	4.7	4.6	4.7	4.5
Horizontal FOV at min focal length	degrees	77.6	80.2	43.6	45.6
Vertical FOV at min focal length	degrees	47.5	57.4	25.1	30.8
Horizontal FOV at max focal length	degrees	33.7	35	15.2	15.9
Vertical FOV at max focal length	degrees	19.6	24	8.8	10.7
Horizontal Image size at MOD and min focal length	mm	628	658	334	351
Vertical image size at MOD and min focal length	mm	342	426	184	228
Horizontal Image size at MOD and max focal length	mm	235	245	110	115
Vertical image size at MOD and max focal length	mm	134	165	63	77
Lens Mount	PL standard. Conversion to EF / E mount by user				
Focus Barrel Rotation	300 degrees				
Iris	9 iris blades				

EZ-1 Framegrabs on RED 8K VV



EZ-1 FF 45-135 T3.0 on Jarred Land's RED 8K VV Camera



Framegrabs, above and below



EZ-1 Framegrabs on RED 8K VV



Angénieux Type EZ-1 Tests by Band Pro

Randy Wedick is Senior Technical Consultant and DP at Band Pro. On August 8 and 9, he and a crew tested the Angénieux EZ-1 zoom in both S35 30-90mm T2 and FF 45-135mm T3 modes. Jarred Land, President of RED, graciously lent his RED 8K VV camera. Randy writes:

The Angénieux EZ zoom is essentially designed as an affordable documentary lens, but its quality is highly cinematic. So we produced a cinematic documentary as the launch film for IBC.

One of my good friends in LA is fashion designer Antonio Barragan. He's built up a style that combines high-end European tailoring and handiwork with his rough and tumble southern California upbringing: military style tailored jackets remade with silk inside, python skin hot pants, post-apocalyptic motorcycle jackets—that kind of thing. He refers to them as “superhero clothes.” He's dressed many bands, including the Rolling Stones, Lenny Kravitz, Janet Jackson's entire tour crew, hip hop artists, and many more. He recently moved into motion picture costuming, working on *Fast & Furious 8* and an unnamed superhero production.

Our film combines interviews with Antonio, mostly voice over, as we follow him through the design and manufacturing process, and then working with models and a fashion photographer on a real fashion shoot, as well as portraiture and stylized product shots. We combined dolly, handheld and Steadicam moves. Steadicam operator was Aline Ballestero. Our model was Katrina Hunter.

The lens has an interchangeable rear optical section that allows the use of either S35 or Full Frame/VistaVision cameras. We used Jarred Land's RED 8K VV camera and a 6K RED Dragon operating in 5K S35 mode. It's very much an Angénieux lens. It has the color, look and focus fall off that we are familiar with from the Style and Optimo series. For certain shots, especially the interview segment, we were wide open and the look was pretty amazing for faces. There is a gentle and pleasing smoothing of the image wide open. There is a little bit of shading at the edges at wide angle and the focus fall off becomes softer. It's quite nice. It's almost as if they snuck a portrait lens inside of an all purpose zoom lens.

The build quality is very much A-level. The feel of the focus and iris rings is right up there with the rest of their lineup. Bokeh were nice and round, even when photographed at the edge of the frame. For nice, beautiful, gentle images of people and places, without an overly-sharp digital look, this is your lens.



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