Jon Fauer, ASC www.fdtimes.com Sept 2016 Sigma Report

FILM AND DIGITAL TIMES

Art, Technique, and Technology in Motion Picture Production Worldwide

SIGMA Cine Lenses

SIGMA FF and S35 Cine Lenses Tour of SIGMA Factory

Pierre Edelmann with SIGMA Full Frame 50mm T1.5 Cine Lens
on RVZ's RED 8K VV Camera with Cinematography Electronics CineTape.
Photo by Pauline Maillet.

Sigma, Soba, Sake and the Last Samurai

Tsuruga Castle in Aizu Wakamatsu city

Battle at Bungobashi Bridge: Imperial troops at right, Samurai at left.

Sutematsu Yamakawa at Vassar

Aizu is 300 km north of Tokyo: two hours by high speed Shinkansen and then a scenic hour on a local railway. The train winds through high mountain passes and follows the foot of 5,968' high Mt. Bandai. It looks like Sun Valley (3' shorter) rising above jade-green rice paddies. The skiing in winter is superb, as is the sake from the many Aizu breweries that benefit from the pristine mountain water and plentiful rice. Lake Inawashiro, fourth largest in Japan, is a few miles away.

This is the land of the real-life last samurai, upon which themes in the Ken Watanabe-Tom Cruise film were loosely derived. Tsuruga Castle in Aizu was one of the last holdouts, and in 1868 fell to Emperor Meiji's troops. Many of Aizu's families were exiled to northern Japan where they endured many years of suffering. The story is told in a popular NHK TV series, *Aizu: Land of the Last Samurai*.

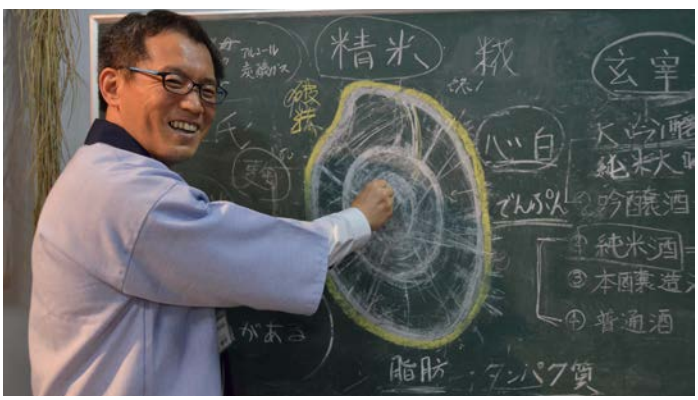
NHK describes the television series: "The skills to survive a tough environment and to care for others thrive in Aizu. From parents to children, from predecessors to successors, the pride of Aizu is passed down. The spirit of samurai from ages ago still lives on."

Sutematsu Yamakawa Oyama (1860-1919) is a local hero. She came from a Samurai family in Aizu who were among the last to surrender to the emperor Meiji. In 1872, at age 12, she was one of five girls to be sent to United States to study as part of a group organized by the Meiji government to educate Japan's future leaders about politics, the military, finance, law, engineering, architecture and other fields.

Sutematsu lived with a family in New Haven, attended Hillhouse High School, and graduated from Vassar College in 1882. She returned to Japan and married Count Iwao Oyama, Japanese Minister of War, in 1883. She was influential in nursing and women's education and became Princess Oyama.

There's a good book about this: *Daughters of the Samurai: A Journey from East to West and Back*, by Janice Nimura.

Sake brewery in Aizuwakamatsu city



Ichijo Koji “Dr. Sake” in the Suehiro Sake Brewery (est. 1850) explaining the process of polishing the rice. It is a bit similar to polishing lenses.

Aizu is famous for delicious Soba noodles and Sake. You require three things to make great Sake: high quality rice, lots of fresh water, and cold weather.

Sake comes in various grades. The outer husk must be removed, and the grain is polished, or milled, to remove the outer layers of fats and minerals. The finer the rice is polished, the higher the grade of Sake, and usually the cost. The pinnacle is Junmai Daiginjo, followed by Junmai Ginjo and Junmai. It’s a hierarchy and process not dissimilar to polishing the elements that go into motion picture lenses. More on lenses in the following pages.

Visitors to Aizu would do well to stay at Ryokan Ashina (below), with its wonderful staff, relaxing hot springs and superb dining.

Old rice polishing machine

L-R: Kazuto Yamaki, Mai-san, Chiyono-san, and Shinji Yamaki

Sigma and new Cine Lenses

But we're not in Aizu merely to learn about Samurai, Sake and Soba noodles. We're here to visit the SIGMA Corporation factory and get an early warning about their plans to enter the cinema market.

The rumors are confirmed. The big booth at IBC makes sense: Sigma is jumping into the cinema industry with a new line of CINE LENSES. The big news is that most of them are Full Frame, High Speed, ridiculously small and incredibly light. Image quality is outstanding. These are not rehoused lenses. They come from the same factory where the superb Sigma Art DSLR lenses come from—the northern region of Japan—Aizu.

The Aizu culture of hard work, attention to detail, and tenacity is shared today by the 1,400 workers of the large Sigma factory who build approximately 1 million photo lenses each year. The 54,757 sq m factory is nestled at the foot of Mt. Bandai in a forest of emerald-green cypress. Almost all the components of Sigma lenses, from tiny screws and iris blades to large diameter front elements are made in this factory.

Sigma still photography lenses come in Full Frame (DG), APS-C (DC) and Mirrorless (DN) — mostly with EF (Canon), F (Nikon), and E (Sony) mounts. Mount conversion service is available at the Aizu factory.

The flagship lenses are the Sigma Art series, primes and zooms characterized by their large aperture, high resolution, high MTF, and beautiful bokeh. Sigma Art Lenses have been described in respected still photography reviews as "spectacular" "superb build quality," and "impressive optics."

And now at IBC, Sigma introduces a new line of Sigma Cine Lenses. The initial set will consist of five Full Frame Primes: 20, 24, 35, 50 and 85 mm, all T1.5 — and a Full Frame Zoom 24-35mm T2.

For Super35, Sigma offers two fast zooms: 18-35mm T2 and 50-100mm T2.

Vist Sigma at their IBC Stand 12.B68
www.sigma-global.com

New Sigma Cine Lenses

Sigma Cine Lenses: S35 18-35mm T2 and 50-100mm T2. FF Zoom 24-35mm T2. FF Primes: 20, 24, 35, 50 and 85 mm, all T1.5. (Note how the focus and iris barrels line up and they all have the same 95mm front diameter

Some of the many Sigma DSLR Photography Lenses

Sigma DSLR Lenses (L-R). Contemporary Series: 30mm f1.4 DC DN (mirrorless), 18-300mm f3.5-6.3 DC (APS-C) MACRO OS HSM.
Art Series: 18-35mm f1.8 DC APS-C, 50-100mm f1.8 DC APS-C. 24-35 f2.0 DG Full Frame.
ART Series Full Frame Primes: 20mm f1.4 DG, 24mm f1.4 DG, 35mm f1.4 DG, 50mm f1.4 DG. Sports Full Frame 150-600mm f5-6.3 DG OS HSM.

Conversation with Kazuto Yamaki, CEO of Sigma

Kazuto Yamaki is the CEO. In this era of outsourcing and offshore production, it is encouraging to see Mr. Yamaki's determination to maintain jobs and manufacturing in the company his father created in 1961. As Mr. Yamaki guided me around the factory, I was impressed how he greeted almost everyone by name. His sense of responsibly for the employment and well-being of hundreds of employees was palpable. It is a friendly place.

Why is this article so long? Never before have I been allowed to see and photograph everything in a lens factory that did everything from glass molding and polishing to assembly, from iris blades to the tiniest screws and contacts. There wasn't a single area, machine or process that was kept secret. "Most of us in the optics business use the same machines and have the same processes," Mr. Yamaki said. "The differences come from the design, the skill of the people who build the lenses, and the attention to detail.

Before touring the facility, Mr. Yamaki and I had a conversation at his desk in the open floor plan office he shares with designers, planners and management teams.

Jon Fauer: Please tell us about the company history.

Kazuto Yamaki: The opening of IBC 2016 marks the 55th anniversary of Sigma Corporation. Our company was founded on September 9, 1961 by my father, Michihiro Yamaki, when he was 27 years old. His family was quite poor. As a student, he worked for a small optics company, aligning the prism in binoculars. After graduating, he worked for a small optics as a corporate executive. One day, the company went bankrupt. The owner disappeared suddenly with the company's money and with his mistress. Some of the suppliers asked my father to work with them as a consultant. It went well and he then decided to start a factory of his own in Tokyo. I remember him saying to me that he had no plans to become an entrepreneur or company owner. He started the business simply because of the request of his suppliers.

His two sisters and my mother worked in the company. It's a family business. At first, they purchased parts from suppliers and just assembled lenses. They built interchangeable lenses for SLR cameras. As you can imagine, business can be very challenging for a start-up company—mainly cash flow. But my father was very fortunate to have a line of popular items. He had the idea to develop rear and front converter lenses. Until then, most of the tele- or wide angle converters were designed for specific lenses because the diameter of the front element is different from one lens to another. He had the idea to develop universal converters that could be used for many cameras and lenses. This became a big hit for Sigma and helped grow the business.

How large is Sigma Corporation?

Today, we have 1600 employees. Our turnover last fiscal year was 43 billion Japanese yen. That's about $400 million U.S. It's a medium-sized company. But I don't want to make it too big. I think this is a good size to maintain state of the art technology, quality and build interesting products. We have subsidiaries in Germany, America, China, Hong Kong, UK, France and Benelux. We also make cameras with Foveon sensors, based in San Jose, California.

Sigma headquarters are in Kawasaki. The factory is in Aizu. Our philosophy is small office, big factory. This was the philosophy of my father, which he repeated to us many times. In the Kawasaki headquarters, we have administration, finance, accounting, human resources, sales, marketing and customer support. But most of the employees are engineers. We have a large optical, mechanical and electronic design teams as well as development, product design and product planning teams.

How many optical and mechanical designers do you have?

Approximately 200 people work in our headquarters and about 160 people are engineers. Over 75 percent are engineers. The optical design team consists of different specialties. Some engineers specialize in ghosting and flares. We call them ghost busters. They run simulations from the initial design and advise the optical and mechanical designers during the entire process. We have a very experienced chief designer. Planning interchangeable lenses for DSLRs requires a lot of team work among the optical, mechanical and electronic designers because we need to put motors inside the lens to drive focus, iris and zoom. The teams have to work very closely from the beginning because each parameter can influence size, weight and optical performance.

So, let's begin the factory tour.
















(We take the factory tour and Mr. Yamaki continues his discussion.)

The people of Aizu.

I was born and brought up in Tokyo. I was eight years or nine years old when my father moved the factory to Aizu. At a kid, I liked to catch insects and beetles. I came here every summer. For me, the people of Aizu seemed very different. They are very diligent, very serious, persistent and pure. This kind of mind-set is very important in making good optics. Aizu was once the capital of northern of Japan. But this area was defeated during the Civil War between the Meiji Emperor's forces and the soldiers of the Daimyo. It is a very sad story. This area became less influential and the economy suffered. There was no industry. Now there are two big factories, each with over 1,000 employees. One is Sigma and the other is Olympus. Both companies polish the glass for their lenses. Everybody agrees that glass from the Aizu area is the best.

Origin of the Sigma company name.

My father named the company. He wanted to honor the experience of the employees. Sigma means summation. It is a sum of the employees' experience, wisdom, knowledge, know-how. That's the power of the company, he believed.

In the beginning we only assembled the parts delivered by outside vendors. We did not make the parts by ourselves. Now we make all the components of the lenses here.

The factory.

The factory is about 77,000 square meters. The floor area is about 55,000 square meters. 1,400 people work here. Production capacity is 90,000 pieces per month. Relative to other companies, we have larger fixed costs because we do everything in-house, by ourselves.

Our strengths are in two main areas: good quality and volume production. Our volume is not as large as Canon, Nikon or Sony. But we pride ourselves on high quality.

The concept of the factory is vertical integration. That means we do most of the steps by ourselves. We process the glass, from molding to grinding, polishing, centering, smoothing, coating, edge blacking, cementing and assembling.

GM, CG, HB, A, EP...

Areas of the factory are designated by signs overhead. GM stands for glass molding. CG means Curve Generation. HB stands for Hybrid. EP is Engineering Plastic—making component parts by injection molding. A stands for Aspherical. We do glass molding of aspherical and hybrid aspherical elements. Hybrid begins with a normal glass element. We polish it. Then we put resin on top of the glass and form the aspherical surface. Glass molding involves heating the glass up to 500º C or 600º C, and pressing it under high pressure to form the aspherical shape.

Molding, polishing, centering, smoothing...

Building a lens moves along various areas of the factory: molding or polishing, smoothing, carbonization, centering, coating, subassembly, assembly, inspection, packing, and shipping.

We don't grind the glass to make aspherical elements. Instead, we only do molding or hybrid production. We don't do molding for spherical elements. Spherical is all polishing. Probably we could do molding of spherical elements, but I think polishing glass is better to obtain a very fine surface.

It would be faster to make spherical elements by molding. Some glass suppliers are studying it, but we still believe traditional polishing is better. Some companies do not polish glass by themselves. They source from outside suppliers. As I said earlier, I don't like to rely on outside suppliers. Sigma is a small company. We prefer to maintain our technology and retain the engineers who make it possible.

I believe we make some of the largest diameter glass molds. We are now working up to 100 mm. The challenge is to achieve high volume—1000 or even 5000 pieces. It is not easy to maintain high yield and high quality lenses at a low production cost.

Anti-reflective coatings are applied here as well. We assemble and inspect it, the lens and packaging.

We do not make individual electronic components. We buy the semiconductors, memory and CPUs from suppliers. But we do the board assembly. And we also do surface treatments of metal parts: anodizing, painting, printing, and plating.

Product Development.

Most of the product development is done at headquarters in Kawasaki, but we also have an engineering and R&D team. These engineers specialize in the manufacturing process.

We have a prototyping team here and we make the tools ourselves. So we have a tool design team and a tool manufacturing team for most of the machines. A few things come from local suppliers, and most of them are located in northern part of Japan. That way if something happens, we can easily get together and discuss how to solve the problem in a face-to-face meeting.

Many of the big companies have a very broad, worldwide supply chain network. I personally have no idea how they can handle this kind of issue. They find the cheapest prices, the cheapest parts from all around the world and assemble those parts where the cheapest labor is available. I think that's quite complicated because the suppliers often speak different languages and they cannot easily get together for meetings. Here we can communicate very closely and work together.

In terms of cost, we do not have an advantage because parts from Japan are quite expensive compared to parts from China, Vietnam or Thailand. But in order to make a high quality product, I think our system is good. It may be an outdated system for a modern company, but I still think it still has advantages.

Polishing Spherical Elements

Traditional lens polishing of spherical elements in a vast “analog” machine room at the Sigma Aizu factory

Ueno Shoichi, in charge of polishing

Molding and Aspherics

Molding aspherical elements is done by heating the glass up to 500º C or 600º C and pressing it under high pressure to form the aspherical shape.

Ishii Masatoshi, in charge of glass molding

Checking spherical elements on an interferometer

Preparing the optical elements in large trays prior to coating

Large vacuum deposit machines coat the lenses with an antiflective (AR) coating that improves contrast, reduces light loss, glare and flare.

CNC Machining

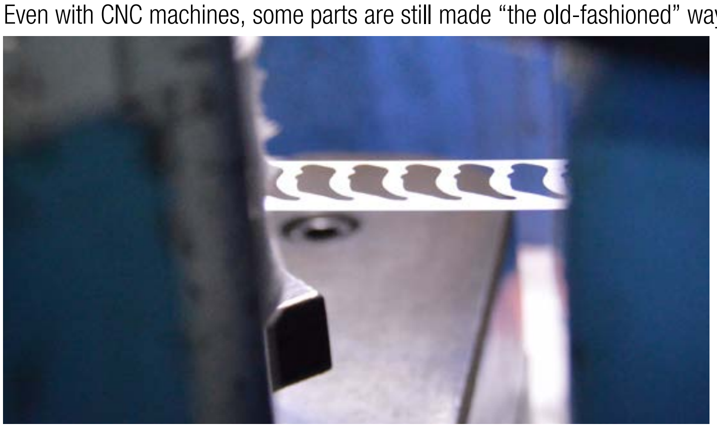
A forest of CNC machines craft mechanical parts like lens barrels. Engineers load the designers' plans into computers that guide the machines.

Cam focus guides

Hand finishing a sub assembly

Mechanical Parts

Even with CNC machines, some parts are still made "the old-fashioned" way. At right: long bands of metal are cut into shape to make lens irises.



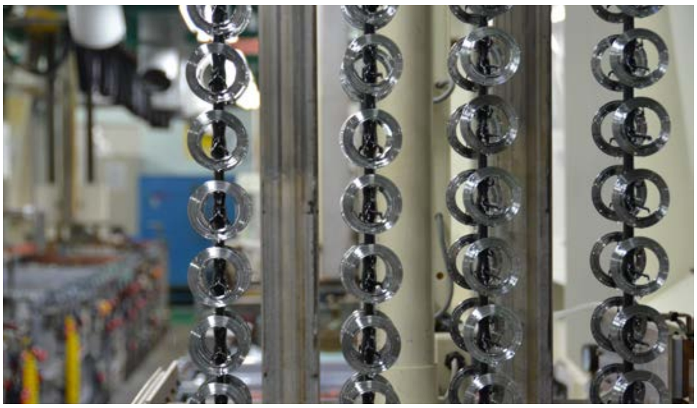
Iris leaves are cut into shape

The iris leaves are anodized, sorted and assembled by hand

Anodizing and Painting

Aluminum parts are prepared on trays prior to anodizing

Anodizing is done on a vast scale in house in many colors and shades



Lens mounts

Painting the cover of a teleconverter

Inspecting and Assembling Lenses

Final Assembly and Testing

Each finished lens is hand inspected and tested on its intended camera

The Pearl Optical Industrial Lens Projector is used everywhere in Japan

A new 35mm T1.5 Sigma Cine lens is tested on the projector

Sigma FF and S35 Cine Lenses

Sigma is in a very good position to enter the motion picture market. Kazuto Yamaki's "small office" was able to streamline decision-making, and the 1500 lens-makers at the "big factory" in Aizu are able to build everything in-house, from the smallest set screws and iris leaves to the aspherical elements and barrels.

I sense that when the boss noticed a demand for high-performance cine lenses at reasonable prices, the company was able to respond quickly. Sigma planners and designers realized that professional cine equipment was built in relatively limited numbers, with longer R&D cycles, and higher costs. It was a completely different business model than the faster-paced, price-driven, trend-conscious consumer photography market they were accustomed to. Sigma had long been in the enviable position of being able to design high quality lenses and produce them in large quantities. And large quantity production lowers costs to consumers.

Sigma already had a great deal of experience building the acclaimed Global Vision lineup of still photography lenses for 50-megapixel-plus, ultra-high resolution cameras. They were able to use that knowledge in this new line of cine lenses.

By using similar optical elements as the Sigma Art DSLR series of lenses, these cine lenses benefit from economies of production. The mechanical design is completely new.

3 categories of Sigma Cine Lenses

FF (Full Frame) High Speed Prime Line

The initial set of five FF Primes will be 20, 24, 35, 50 and 85 mm—all T1.5. They cover Full Frame format of 24x36mm (43.3mm image diagonal), although recent tests suggest they cover a larger area. Of course, they work on both Full Frame and Super35 cameras: a 20mm T1.5 remains just that in both formats.

Sigma Cine lenses come with a choice of EF (Canon), E-mount (Sony), and PL mounts.

FF (Full Frame) Zoom Line

The Sigma Cine 24-35mm T2.2 is a wide, compact, lightweight, high quality zoom for Full Frame and, of course, Super35. This is the wide, short zoom that will be helpful for Steadicam, handheld, rigs, car shots, helicopter mounts, drones, as well as studio establishing shots. The 24-35 T2.2 comes in EF or E-mount. Not PL.

S35 (Super 35mm) High Speed Zoom Line

Two Sigma Cine High Speed S35 Zooms will ship in the initial release: 18-35mm T2 and 50-100mm T2. They come in EF (Canon), E-mount (Sony), or PL mount.

Sigma FF and S35 Cine Lenses

Lightweight and Compact

Sigma Cine lenses are all lightweight, compact and fast. This is quite an accomplishment for Full Frame models.

Dust-proof and splash-proof

They have the same dust-proof and splash-proof construction as the Sigma 150-600mm F5-6.3 DG OS HSM | Sports lens. Each ring and mount is sealed to help prevent water and dust from entering.

100% metal body

The body is rugged. No plastic parts.

Luminous paint

Lens designation, index lines, witness marks and scales use luminous paint to aid in changing and operating the lens in the dark.

82mm front filter

The front filter is standardized at 82mm on most models.

95mm front diameter

The front diameter of all the lenses is 95mm.

Gears

In each product line, the position of the lens gears and barrels are the same for all lenses. This saves time mounting lens motors and accessories. Each lens has an industry-standard 0.8M gear pitch.

Barrel rotation

All lenses have focus barrels that rotate 180°. Focus is guided by cams for smooth focus pulling. The zoom ring rotates 160° on all zoom lenses. The iris ring is linear—with constant distance between T-stop marks. It rotates 60°. There are no click steps.

EF, PL and E-mount

Sigma Cine Lenses are available in Canon EF mount, Sony E-mount, and PL (except 24-35mm T2.2 FF).

Mount Conversion Service

Niels Bohr said, "Prediction is very difficult, especially if it's about the future." One thing is certain: we don't know what mount the industry will settle on in its Full Frame future.

So, it's nice to know that you can change your mind about lens mounts on Sigma Cine Lenses. They have been addressing this situation for some time with their still lenses. Sigma's Mount Conversion Service will be available for the new cine lenses. Customers will be able to have their lens mounts swapped for a reasonable fee. It's a good way to future-proof one's investment in lenses.

One way to hedge your bets between EF and E-mount is to get the lens with an EF mount. Then, purchase a Sigma MC-11 MOUNT CONVERTER to use Sigma's EF mount lenses on a Sony E-mount camera body.

Electronic contacts

The EF and E-mount have electronic contacts so the lens can communicate with the camera body (focal length, focus distance, aperture, etc.)

Lens support

A removable lens support comes standard with all models.

Rollout

For the first phase, it is expected that Sigma will release two zoom lenses toward the end of 2016. Another zoom lens and 5 prime lenses will be released in 2017 onward. A Sigma executive said, "We will develop additional zoom and prime lenses, and the lens lineup will be enriched further. The latest release information will be updated on our official website (sigma-global.com)."

IBC

Sigma will have a big booth at IBC in Amsterdam and I can only imagine the number of cinematographers lining up with requests for additional lenses in their favorite focal lengths.

Sigma Cine Lens Specs

Lens	Aperture	Close Focus [1]	Image Circle	Front Diam.	Filter Size	Length		Weight [4]		Full Frame FF[5]	Super 35mm S35[6]	APS-C[7]
						EF mount[2]	E-mount[3]	EF mount	E-mount			
20mm T1.5 FF	T1.5 - 16	0.276m 11”	FF Φ43.3	95mm	-	118mm	144mm	1335g	1395g	94.5°	70.3°	70.8°
24mm T1.5 FF	T1.5 - 16	0.25 m 10”	FF Φ43.3	95mm	82mm	95mm	121mm	1125g	1185g	84.1°	60.8°	61.2°
35mm T1.5 FF	T1.5 - 16	0.30 m 1’	FF Φ43.3	95mm	82mm	95mm	121mm	1135g	1165g	63.4°	43.8°	44.2°
50mm T1.5 FF	T1.5 - 16	0.40 m 1’4”	FF Φ43.3	95mm	82mm	102mm	128mm	1295g	1355g	46.8°	31.5°	31.7°
85mm T1.5 FF	T1.5 - 16	0.85 m 2’10”	FF Φ43.3	95mm	86mm	134.5mm	160.5mm	1475g	1535g	28.6°	18.8°	18.9°
18-35mm T2 S35	T2.0 - 22	0.28 m 11”	S35 Φ28.4	95mm	82mm	129.5mm	155.5mm	1445g	1505g	-	76.1° - 43.8°	76.5° - 44.2°
50-100mm T2 S35	T2.0 - 22	0.95 m 3’2”	S35 Φ28.4	95mm	82mm	175.2mm	201.2mm	1885g	1945g	-	31.5° - 16.0°	31.7° - 16.1°
24-35mm T2.2 FF	T2.2 - 22	0.28 m 11”	FF Φ43.3	95mm	82mm	122.7mm	148.7mm	1440g	1500g	84.1°- 63.4 °	60.8° - 43.8°	61.2° - 44.2°

Sigma CIne Lenses will be available in EF (Canon), E-mount (Sony), and PL (all except 24-35mm T2.2 Full Frame Zoom)

1. Close focus distance is measured from the image plane
2. Front to EF mount flange
3. Front to E-mount flange
4. Without lens support foot
5. Horizontal angle of view for a full-frame camera aperture (aspect ratio 1:1.5,dimensions 36 mm x 24 mm / 1.42“ x 0.94“)
6. Horizontal angle of view for a super 35 digital cinema camera aperture (aspect ratio 1:1.8,dimensions 24.6 mm x 13.8 mm / 0.97“ x 0.54“)
7. Horizontal angle of view for an APS-C camera aperture (aspect ratio 1:1.5,dimensions 23.7 mm x 15.7 mm / 0.93“ x 0.62“)

Specifications are subject to change

RVZ RED VV 8K Sigma 50mm Test in Paris


Pierre Edelmann


Focus Puller Yannick Touzan (l) and loader Martin Dwernicki (r)

July 21. Samuel Renollet, Camera Department Manager at RVZ Paris, sends an email: “We’re getting our RED 8K VV camera tomorrow. Does anyone want to do Full Frame lens tests?”

As a matter of fact, someone does:

July 25. “Dear Mr. Renollet. I’m Kazuto Yamaki, CEO of Sigma Corporation. Jon Fauer told me that you would like to test lenses on your RED 8K VV camera. You may have heard a rumor that Sigma may enter the cine lens business.”

August 2. Samuel rounds up the usual suspects, equipment, lights, cool RVZ RV, still photographer Pauline Maillet, and the talented cinematographer Pierre Edelmann.

August 3. Pierre Edelmann books actress and crew, scouts locations around Paris, does storyboard, organizes schedule, plans shot list.

August 5. The Sigma Cine Lens Test begins. The title is *12 Weeks.* It is completed in one day. It is online and may be screened at IBC.


Steadicamer Sacha Naceri, gaffer Arthur Benoist, actress Alexia Giordano


Photos: Pauline Maillet

RVZ’s RV

Framegrabs of Graded RED VV 8K with Sigma Cine Lens

by Pierre Edelmann, Directeur de la photographie

I am very pleased with the Sigma 50mm Cine Lens. It covers the whole RED 8K VV sensor. Peripheral illumination is quite consistent. There is a slight shading that is hardly noticeable when shooting a flat and evenly lit surface. (No vignette in FF.)

Shooting on the RED's 40mm wide sensor certainly helps get the very shallow depth of field that everybody seeks nowadays.

I decided to shoot unfiltered (except for NDs) and I must say it retains a lot of information, even wide open at T1.5. It might even give just a bit too much sharpness for me if used naked, which might be a good thing—enabling DPs to use their favorite diffusion filters, or even filters they wouldn't have used on any other set of lenses, which is my situation.

The lens is well protected from flares. A light source must really be facing the lens straight-on for there to be any effect; tangent rays of light tend not to disturb the lens at all. Breathing is almost nonexistent. When focusing very close (under 3 feet), I think I can feel some compression on both sides of the image, which is, in my opinion, a good thing.

Chromatically, I loved the lens. Colors are very carefully respected. Wide open, the edges of the objects in focus are very clean. It is very reassuring to know that even shooting under T2 you won't loose the object separation you're looking for. Being certain that no fringing will appear on the edges of the objects you're shooting is also very reassuring.

Jon Fauer comments:

Thank you Pierre, Samuel, RVZ, Pauline and crew. The framegrabs above illustrate a wonderfully creative reason to love Full Frame format. You get shallower depth in Full Frame with this larger format's 50mm focal length. To achieve the same angle of view in S35mm spherical, you would use a 35mm focal length lens, which has more depth of field. Full Frame spherical has about the same depth of field as S35mm anamorphic lenses.

Panavisoin's Dan Sasaki explained this in our April edition: "The image produced in the VistaVision format provides a much more natural perspective and magnification than its Super 35mm counterpart. The larger imager more closely relates to how we see naturally. The larger format gives us a more natural perspective, meaning fewer distortions and a more natural depth of field.

SIGMA

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