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FILM AND DIGITAL TIMES

Art, Technique and Technology

Film and Digital Times is the guide to technique and technology, tools and how-tos for Cinematographers, Photographers, Directors, Producers, Studio Chieftains, Camera Assistants, Camera Operators, Grips, Gaffers, Crews, Rental Houses, and Manufacturers.

It's written, edited, and published by Jon Fauer, ASC, an award-winning Cinematographer and Director. He is the author of 14 bestselling books—over 120,000 in print—famous for their user-friendly way of explaining things. With inside-the-industry "secrets-of the-pros" information, *Film and Digital Times* is delivered to you by subscription or invitation, online or on paper. We don't take ads and are supported by readers and sponsors.

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Introduction

Let the games begin with another FDTimes NAB edition. Articles are arranged partly by theme but mostly in order of diligently met or missed deadlines.

NAB 2013 buzz will be anamorphic lenses, more K and 4K, ways to shape the image with new lenses, filters and effects. Ways to connect cameras, recorders, rigs and accessories, ways to move cameras, to illuminate, and ways to stand out.

Standing out was what the AFC Micro Salon was all about last month. This annual expo and gathering of the Association of French Cinematographers in the former Pathé Film Studios in Montmartre is a favorite show. Imagine Cine Gear with fine wine and finer food. Rental house owners and technicians were peering intently into lenses with high powered Maglites and magnifying glasses. Scrutinizing lenses on projectors. Counting lines, looking for distortion, searching for color aberrations. Looking "into" lenses or looking "through" lenses? All fine but why?

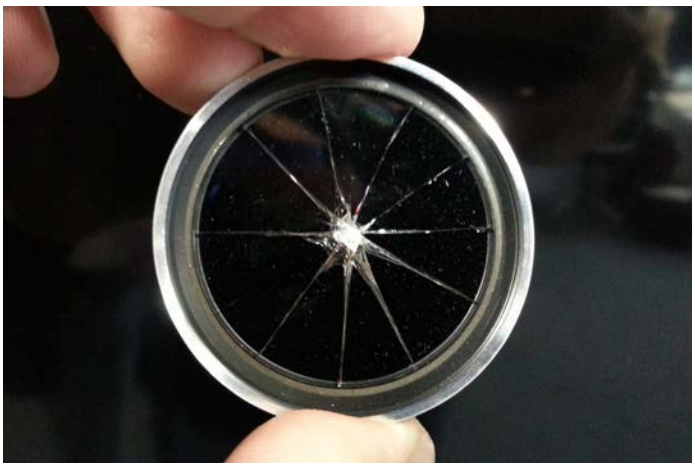
While some at Micro Salon were looking into places offering the best production incentives, cinematographers were engaged in passionate discussions on how best to customize the digital image, using vintage lenses, trying any deliberate or desperate measure to give their work a unique character in the face of digital cameras whose sensors they felt were all similar. It's not just France. We hear it worldwide: apprehension that digital cinematography sometimes seems like shooting with one film stock and using the same lab.

Some have said that film was unique as a capture medium because of its random permutations of many different film emulsions, exposed with a panoply of different cameras, lenses, and filters, processed by many different labs, using different chemicals and even different water, timed and printed in various ways. The concern lately has been with homogenized digital sensors, inside the same cameras, auguring a perceived reduction in creative possibilities that a cinematographer might have.

Cinematographers always had love-hate relationships with cameras. A camera was never built that didn't suffer drilling, grinding and the ministrations of retrofit syndrome to make it unique. But not everyone has a Philippe Ros, Olivier Garcia, Nicolas Pollacchi, Hervé Theys or a company like HD Systems ready to redesign custom gamma curves for their digital cameras. So, it's back to what cinematographers always knew: lighting and lenses.

Carey Duffy continues the theme with his "Chamber of Secrets" filters tutorial. The adjacent piece "Looking Through a Lens" is an opening salvo in this discussion.

Looking Through a Lens



Caution: this article may raise a few eyebrows. Do not attempt: the picture above is the element of a very expensive lens dropped accidentally. Curiously, continued shooting with the damaged lens resulted in images that weren't unusable.

For years, I thought that dust, digs and little scratches inside a new lens or on the front element were the equivalent of a sloppy surgeon leaving a sponge inside the patient. How often did I torment lens manufacturers by asking for a dozen new lenses to be presented, each of which I would painstakingly inspect and reject until I found the most pristine of the pristine. Ironically, all this persnickety prep went out the window after the first day on location (EXT. SANDY, SALTY WINDSWEPT BEACH - DAY). Lenses are not hermetically sealed. Dust, dirt, smoke, and soot find their way inside lenses the moment they leave the factory.

Scratches on lens elements may cause a tiny part of the image to be a little less sharp. In most cases, we won't notice the difference unless it occurs along an edge that's supposed to be razor sharp, like text or a straight line, or part of a flare. For faces, fashion and beauty, there could be a benefit—although using a filter to soften the image is a much less costly and eminently more reversible method than attacking your $25,000 Summilux-C with sandpaper. At wider apertures, much less of the scene is in focus, so a scratch is more likely to blend in with everything else. When you stop down to T16, you may notice the effects of a scratch because everything is much sharper by comparison. In other words, scratches are less apparent at wider apertures. Nevertheless, camera rental houses will hold you responsible if you scratch a front lens element. You'll have to pay for the replacement cost, just as Hertz and Avis will hold you responsible for a dented bumper.

It turns out that scratches, digs, sleeks, and other tiny marks from the polishing and manufacturing process, as well as scratches encountered in the real world, are not the end of the world.

In his paper for the 2010 International Optical Design Conference in Jackson Hole, WY, Cody B. Kreischer wrote that surface quality specification with most optical components is for cosmetic purposes only. Cody is President of Kreischer Optics Ltd (www.kreischer.com). He explains, "It would take 26 optical elements with 2 pits of 0.5 mm diameter and one scratch 0.008 mm wide by 10.0 mm long to produce a 1% drop in contrast at the image plane. Although this is a simplified example, for the majority of optical systems, surface quality has negligible effect on optical performance." (*The Adversarial Relationship between Optical Performance and Scratch-Dig;* opticsinfobase.org)

As J. L. Plummer said, "Optics are made to look through, not at." (SPIE, 1979, vol. 181, pp. 90-92.)

Eureka. I had always wondered how still photographers managed with multiple cameras dangling and optics clanking together, with lenses dusty and scratched. To paraphrase the Clint Eastwood line in *Magnum Force*, "You've got to know your limitations." To learn more about limitations, I spoke with manufacturers, rental houses and lens gurus.

Iain Neil, Optical Designer of the Leica Summilux-C and many other cine lenses, said, "When we talk about scratches and digs we are really talking about very small cosmetic defects. For example, residual polishing marks called sleeks appear as fine scratches and sometimes they are only a fraction of a wavelength in width but sometimes appear like other scratches which may be much coarser. Unfortunately, sleeks are common to see on exotic glass types, which virtually all lens companies use to achieve high performance images. In addition, they are hard to see unless the lens is looked into with a high power projector. Lenses with large exit pupils and extra edge blacking may also tend to magnify these sleeks. Almost all high performance lenses will exhibit some small cosmetic blemishes, primarily due to high technology glass, coatings and fabrication. These will tend to be more noticeable in lenses where the blacks and skin tones are best. When you look into these lenses on a powerful (say 400 watt) projector, the cosmetic defects may stand out more. It should be noted that this would probably not be visible when holding the lens by hand and looking through it by eye at a blue sky, because chances are that the cosmetic defects would be almost invisible in that viewing situation."

Jon Maxwell, Optical Designer, said, "We are all using more 'exotic' glasses that are necessary to deliver the increased speed and performance that the industry now expects. The difficulty is that until these glasses are anti-reflection coated they are more susceptible to cosmetic marks, environmental attack and polishing artifacts. These cosmetic defects are no more 'dangerous' than they ever have been, but they can be more numerous."

Les Zellan, Chairman of Cooke Optics said, "Most of these artifacts are not visible under our 60 watt light bulb test; but put a lens on a lens projector or shine a bright point-source LED flashlight through the lens and all sorts of 'things' can become visible. None of these 'things' affect the performance of the lens and to some extent it is the trade-off that has to be made to get lenses that perform to today's expectations. In the end, it is important to remember that there are no images of any kind formed in the lens; the light rays go through the optics of the lens to produce a focused image on the detector (film or digital), and cosmetic defects, by definition, don't affect the quality of that final image. At Cooke we strive to give our customers the best possible lenses both optically and cosmetically."

Jean-Marc Bouchut, Angénieux Technical Support Manager said, "Cosmetic defects have no impact on the image quality; unfortunately, for some customers who do not have sophisticated test equipment, it is an important acceptance criteria."

Dominique Rouchon, Angénieux International Marketing and Sales Director said, "At Angénieux, we always target perfection, including the cosmetics aspect, particularly on our high end range of lenses. It is a fact that such an approach has a cost, ultimately increases the production costs, and makes the price of the lenses higher. We do our best to train our customers on the subject in order to make this approach change. We hope this article will contribute to this understanding and help people recognize that there are many more important criteria to evaluate in a lens."

Larry Thorpe, Senior Fellow of Canon's Professional Engineering & Solutions Division, said, "All of the major lens manufacturers have mastered multiple aspects of optical design and manufacturing over many decades. The science of optical design is tightly bound up with the science of tolerancing. Lens elements are made to tight tolerances that encompass their shape, thickness, and surface accuracy. The required polishing to achieve that surface accuracy takes time —and that time is expensive. Tolerancing of the inevitable tiny imperfections to those surfaces known as digs and sleeks that remain has been stringently optimized to strike the requisite balance between the tolerances necessary to meet the lens system performance specs and the manufacturing costs entailed in meetings those tolerances. Attempts to significantly better those imperfections can quickly lead to soaring manufacturing costs."

Otto Nemenz, President of Otto Nemenz International said, "Sometimes camera assistants come to check out lenses and reject them if there are little specks, dust or digs inside. There are more important things to look at, like backlash and tracking."

All this might seem to be good news for over-worked camera assistants and rental house floor technicians. But not so fast. Sleaks or dust inside the lens may not affect performance, but they may still be viewed with the same degree of horror as the owner who has just purchased a new Lamborghini Gallardo and discovers a scratch on the mirror. Performance may not suffer, but pride does.

Cody Kreischer added, "The fact is that the better the optical quality, the harder it is to make a lens look 'pretty.' The glasses needed for the best color correction tend to be more difficult to work with, in addition to being expensive. Also, the higher the 'as built' performance needs to be, the tighter all the tolerances of the lens need to be, which includes surfaces which may need to be literally within a millionth of an inch (0.000001") shape accuracy and very tight center thickness tolerances. Kreischer Optics makes high-end optics for commercial, medical and military applications, often in small quantities, which often require skilled hand polishing to achieve these tolerances. If a surface has to be repaired for a scratch, you are basically starting over, and less likely to finish it to as good an optical quality as it was before. In most cases, cosmetic quality is 'just for pretty' (as my wife says) and does not equal optical quality (performance)."

Iain Neil wrapped up, "Having pointed all these things out about lenses, there is another kind of contamination to worry about. Potentially much more significant than stuff inside or on the lens is dust lurking on the sensor itself, on the cover-glass surfaces, or on the sensor filter surfaces. Because it is so much closer to the image plane, sensor dust could cause a greater problem with image quality than most lens scratches or digs."

As we scratch the surface of NAB 2013 proclamations and dig our heels into the expo's endless carpets, we'll seek out new tools and techniques that tempt with aspirations of creating images that stand out. As we move to more immersive and higher resolution cinema, I expect our lenses will become even more exotic and even more important. The adventure continues. ❐

Tiffen and the Chamber of Secrets

By Carey Duffy

As digital technology attempts to replace origination on film, long the bastion of many cinematographers, a collective anxiety questions whether new image capture paradigms have led to a reduction of creative possibilities. This has fundamentally challenged the cinematographer's ability to work, poetically speaking, "in the dark." What remains to enable a cinematographer to stand out?

With the proliferation of on-set monitors and LUTs, the ability to craft moving images without interruption from the video village is a thing of the past for many. Only too often do we hear the phrase "shoot it clean and fix it in post," challenging the cinematographer's pursuit to fulfill the creative brief.

But, as this new digital broom sweeps film away, it introduces new and wonderful tools whose potential seem endless. With so much to learn about these new technologies and workflows, the modern cinematographer (whether schooled in film or fresh to the industry) embarks on a new quest. However, the one remaining factor that has been ever-present in this transition is the primary objective to process focused light on reaching a recording format. How the image is crafted onto that format is now one of the hottest topics of debate about what being a cinematographer is in this new digital age.

For many the concept of "burning in the image" at the point of origination has been a long-held doctrine. This is where the visual interpretation of imagery begins its journey. The tools used are the cinematographer's primary instruments of control over the quality and character of light encountered on a production.

Lens choice is the primary tool to advance the visual storytelling process, determining angle of view, point of view, focus, sharpness or softness, and "speed of light." The cinematographer's secondary tool kit is one that still often remains a guarded secret, an arsenal of "dark arts." To the uninitiated, a clean image is all that is required for digital acquisition. The world of Post image manipulation is open to all who can turn on a computer.

We do not forget that Post Production and effects work for cinematographers has always been an inherent part of the job. So, what is this guarded secret of dark arts that I refer to as a secondary tool kit? I am talking about all the other pieces of glass that illuminate, craft and conjure up images and feelings that enter our consciousness without ever being openly discussed apart from those in the know. I am, of course, referring to the use of camera filters. It seems that these highly sensitive optical tools are rarely discussed in major cinematographic publications apart from broad, sweeping references. I hope to enlighten with a discussion about the different technical and aesthetic advantages they provide. Their diverse use and intricate ways can help resolve the anxiety of today: that my camera looks so very much like your camera, but I want to find a way to make my images look different from yours.

Camera filters have been used since the beginning of photography. It is easy to simply split filters into two major categories: chromatic and non-chromatic (or think of it as color and effect, or filters you need and filters you like). This helps classify filters but it does not tell the full story. Filters are used to solve technical problems or add aesthetic mood and sensations. Nevertheless, an aesthetic effect can be achieved by using a technical filter and a technical effect can be achieved by using an aesthetic filter. Use is open to an individual's interpretation. The laws of physics govern capturing of moving images regardless of acquisition format, however these laws may also be tested and broken.

False color or pollution - where it starts or ends

One of the biggest changes with the move to digital is the advantage of higher ISOs. This, in turn, has created a challenge for standard neutral density transmission reduction filters (NDs). NDs are considered to be a vital tool for cinematography. But the problem with standard NDs is that they do not cut the wavelengths that adversely affect the sensor's color reproduction. In short, they allow pollutant wavelengths and false color (Far Red 680 nm to 700 nm, Near I. R. 700 nm to 750 nm, and sometimes Far I. R. 750 nm and beyond) onto the sensor. This new problem means that filter manufacturers have had to rethink NDs. Their answer has been to produce a new type of Neutral Density filter, the "IRND" to replace standard NDs for digital cameras. Every camera model has a different sensor and algorithm designed to produce their own color space. The goal of producing a specific answer to reduce neutral light transmission across individual sensors reading and cutting wavelengths at different nanometers is currently not available. That's why a one-size fits all answer has been formulated by the filter manufacturers. Each different camera model also uses a different internal IR blocking filter and a different Optical Low Pass Filter. To complicate things more, Neutral Density translucent dyes used in the manufacture of filters from all manufacturers vary from batch to batch. Only now are camera manufacturers introducing internal IRND filters, but even then they do not cover all stop eventualities.

It is easy to understand why this issue causes so much confusion. One constant phenomenon is that digital sensors need to read light into the Far Red end of the spectrum to produce great looking skin tones. And this is where pollution starts.

There are other ways to cut polluting wavelengths with filters. These are specifically-designed band cut filters using coatings to cut at a given wavelength. The issue with these types of filters is that they do not cover all focal lengths. The coatings used introduce chromatic vignetting on wider focal lengths.

Filters that reduce Far Red and Near IR pollution on digital cameras need to start working within the visible spectrum. For some

cameras, this issue appears under normal lighting conditions such as Daylight or Tungsten, even without the use of an ND filter. Understanding your camera sensor's response in various lighting environments has never been so important.

Therefore, reducing visible light to control Depth of Field, for the foreseeable future, will inevitably mean that in-camera internal white balancing or secondary color correction will need to be applied when dye based IRNDs are used. At NAB this year Tiffen will be exhibiting its new IR VARI ND primarily designed for the Blackmagic Camera. Some might see this as a step towards tailoring and improving filter designs for specific cameras and their sensors.

In the digital world some cameras do prevail over others. Daniel Pearl, ASC mentioned in *FDTimes* February issue when discussing Vantage One T1 lenses, "In the digital world, most of us are shooting with the same camera(s) as if we all used the same 'film stock.' So lenses are becoming more and more important. The glass we choose separates one cinematographer from another." Camera filter glass should be considered as equal in this statement and can go even further in determining the look of a cinematographer's image.

The current vogue towards uncoated lenses that produce additional flares and lowering of contrast can be introduced to modern lenses with filters to differing degrees. They can add flare filters (offered by all manufacturers in varying degrees) and a wide range of contrast reduction filters such as Low Contrast, (which all filter manufacturers offer) or Soft Contrast and Ultra Contrast (that are only manufactured by Tiffen). A wide range of refinement can be introduced onto modern lenses that the lenses themselves were not designed to achieve. A camera and lens set can be hired in London, Rome, New York or Paris—and all may look the same when taken out of the box and turned on. It is camera filters that offer cinematographers the ability to build their look in-camera in the digital age as they have done in the age of film.

Are you Diffused now?

Contrast reduction is one of the three ingredients of diffusing an image with a camera filter. Diffusion filters are the most commonly used form of artistic filtration of moving images. Understanding diffusion filtration is very simple once the code is cracked. Knowing how the name of each filter type relates to its corresponding properties is another question altogether.

The three main properties of Diffusion Filters are resolution reduction, contrast reduction, and halation / flare increase.

Any brand-named diffusion filter can use one of these properties or combine the effects of two or three to produce their effect. Tiffen alone has 14 stand-alone brand-named and trade-marked Diffusion Filters, with 4 of these diffusers combined with an 812 to produce a warm version (that's now 18) and 4 more are currently combined with either IRND or IRND Polarizers (that's now 21). Next, lets add 3 different named contrast reduction filters and consider that more IRND combination filters are planned and new filters are due for release. Do you think you are ready to address the images that 4K cameras deliver with your current knowledge of diffusion filters? It's never been more diffusing! To say that you only use ProMist is no longer an option if you want to be creative when using a camera and sensor that so many others can also use by opening up a box.

Combining to Reduce

Diffusion is not the only form of combined filtration available. The increase in resolution and improving lens technology means unwanted flares and reflections need to be addressed. To speed up shooting Tiffen has combined its award-winning IR filter technology with Polarizers, for combined IRND Polarizers. Not only is this combination useful for landscape photography but also when shallow Depth of Field (DOF) is required on a beauty shot and highlights on the skin or clipping require removal.

Reducing DOF and adding subtle diffusion to a scene or leading lady is a standard practice for cinematographers. This is why Tiffen has introduced IRND Glimmer Glass, Black Pro Mist and is rolling out a wide range of versatile combination filters combining two, three or even four filters into one piece of glass. This allows more effects to be used in smaller matteboxes or on a Steadicam, compact camera, or DSLR.

Never before has there been so much choice and accessibility to cameras that shoot moving images. This influx of cameras has introduced many people to the wonders of capturing moving images often without appreciating the refinements needed to craft these images, or forgetting the long lessons of silver halide history. Through the use of these tools, higher quality images can be crafted when the possibilities are explored. This was highlighted at a recent IMAGO meeting in Brussels during a debate called "Is technology driving cinematographers or can creative cinematographers drive technology?" Sean Bobbitt, BSC said, "It is incumbent on cinematographers to keep in contact with manufacturers to help lead innovations."

Tiffen strives to deliver products that cinematographers need in order to deliver images, thus helping to create the visual platform that creates the story. It is my hope that cinematographers continue to use the dark arts when uniformity of sensors threatens their sensibility. In my mind, camera filters are not only one of cinematography's fundamental tools but truly are a cinematographer's secret sauce, and when used in innovative ways can change the way we enjoy and experience moving images. Tiffen's NAB Booths are C8818 and C9015. www.tiffen.com ☐

Carey Duffy began his career in the film industry as a runner in 1981. After serving his apprenticeship he turned freelance as an Assistant Director working for prominent commercials production companies like Ridley Scott Associates in London's Soho district. Here he was exposed to the leading cinematographers in the UK of the day. In 1986 he started a production company called "3Dz" with his father and brother. The company's USP was to own all its own equipment and studio in the fashion of photographers of that time. His father, one of the "Terrible Trio," was the renowned DUFFY. (www.duffyphotographer.com)

In 1992. Carey left "3Dz" and took over control of South London Filter Ltd. Here Carey put his knowledge of productions' and cinematographers' needs into the daily running of the world's only dedicated camera filter Specialist Company, developing bespoke filtration products for both rental and sale including innovative filter products for post production. In 2009 Carey joined Tiffen International Ltd and reemerged as The London Filter Company now working out of Tiffen International's Pinewood Studio location. Currently Carey is a consultant for Tiffen's camera filter development team, reviewing and developing innovative in-camera filter tools for the next generation of cameras and cinematographers. www.thelondonfiltercompany.com

Pierre Andurand, CEO of Thales Angénieux

Pierre Andurand is CEO and President of Thales Angénieux. Jon Fauer talked with him in Hollywood following the ASC Awards.

JON FAUER: Please tell us about your background.

PIERRE ANDURAND: My background is engineering. I studied engineering, business management and economics at the Ecole Polytechnique in France. Many CEOs and Presidents of French companies studied there. I started my career in aerospace, security and high technology. I worked with Aerospatiale and Société Européenne de Propulsion, involved in space launch programs like Ariane 5.

I have been working in the Thales group for 7 years. This has been fascinating for me, because of the company's diverse activities in communications, transportation, satellites, air traffic control, banking transactions, defense, and more. Thales is a worldwide group with 67,000 employees in 56 countries.

I think my predecessor Philip Parain did a very good job. He really restored confidence and capabilities within the company. When I arrived, it was reassuring for me to see that the industry was continuing to demand very high performance optics.

This is where Angénieux has always excelled, not only because we have the people to design very high performance optics, but also because of our history and our long term relationships with the cinema industry. I think we provide a good combination of high performance optical designs along with integration of certain human touches and sensibilities. Each product is designed keeping this in mind. The aesthetics of the image are as important as the pure optical resolution and technical characteristics. This is something that really struck me when I arrived at Angénieux, a company already famous and with a lot of very expert people.

Since early childhood I have been a fan of cinema. It was literally a dream for me to be appointed CEO and President of Angénieux. When I arrived at Angénieux I got a warm welcome from the entire cinema community. It was a little surprising for me because this is not so natural in other businesses.

JON FAUER: I think that's because people in the motion picture business like to know the person in charge of a company.

This really helped me to realize how connected Angénieux was with the community. It was clear that my welcome would have been less warm had Angénieux not, for years and years, been very close to all the people working in the cinema industry. This proximity to all the users has been very important for us. It's clearly part of the success of Angénieux, to be very close to its customers and try to better understand their needs.

How many people work at Angénieux?

We are now about 400 people. The company has been increasing its staff for the last 3 years. We want to remain a mid-size company to retain our spirit of innovation. To keep a friendly relationship among our employees, at a size that is still a human level.

Where are you going to take the company?

We see that there is a strong demand for higher resolution. The latest cameras on the market have larger or higher resolution sensors. This suggests that we will be facing the need for even better optics than what we have today.

We will have to include new optical designs and components. We anticipate a big evolution in the way we will design future optics. But it is also necessary to keep in mind that ultimately the final resolution is not the only criterion, the feeling of the spectator in front of the screen also has to be taken into account. I consider that we have at Angénieux a very good mix because we have very strong optical designers having an important background and also experience of putting humanity into the product.

I realized when I arrived at Angénieux that there will be major technical breakthroughs in terms of technology. Probably not for all products, because today's products are already very good and fit many users' requirements. However, we can foresee the demand in the next years, and so we decided to reinforce our R&D Department. The Angénieux R&D Department in Saint-Héand has more than 50 people now. Electronic engineers, optical engineers, high-precision mechanical engineers. Could you imagine 50 people out of a company of 400 are engaged in R&D? That is very important.

That's about 12.5% of the company.

This is consistent with the level of 10% of R&D investment we are planning for this year. We will spend several million Euros to develop new products and new technologies. Smart optics will be one of the areas. I see an enormous potential in that domain. What we will face in coming years is a revolution that could be equivalent to the one provided by Pierre Angénieux when he developed his first zoom.

Do you have something revolutionary to announce for NAB?

At NAB we will announce a full family of anamorphic zooms. We see "Scope" widescreen as the important format for the future. Angénieux has always been keen to find the best way to help cinematographers and users. The basis for this product, and this is something that does not exist today, is a line of compact anamorphic zooms. Since we already have a family of compact Optimo spherical zooms, this is the logical progression. We will develop a full range. We will start with a 56-152 mm anamorphic zoom.

In addition to the 56-152 mm anamorphic zoom, what other focal lengths will you offer?

It's kind of easy to guess. Basically we have today a complete spherical compact Optimo line with 15-40 mm, 28-76 mm and 45-120 mm compact zooms. We also intend to have a complete compact "anamorphic" line including a 30-80 mm, the 56-152 mm and a 90-240 mm. Each one of those lenses will be completely new lenses, and not just existing lenses with adapters.

Depending on demand, we might do a 50-500 mm anamorphic zoom. But today we are focusing first on these compact zooms, because we think that this is the best way to help cinematographers and camera operators work in Scope. They will be about as lightweight as the compact zoom family, and optically they will perform as well. We will first introduce anamorphic zooms with 2x squeeze ratio. We also intend to develop 1.3x squeeze anamorphic zooms. What we hope at Angénieux is that this new family of zooms will really help to democratize Scope, which I consider to be, from all points of view, the quintessence of cinema.

When will you deliver the first anamorphic zooms?

The first prototypes will be shown at NAB 2013. We plan to deliver the first products in early 2014 so they can be used as quickly as possible on productions. As with the entire Optimo family, our zooms have been designed to match the colorimetry of many popular prime lenses. We were satisfied to see that our spherical Optimos are very close to the colorimetry of Cooke and Leica primes. Because our idea was to provide the market with a global and homogeneous solution to facilitate the DP's job, we have decided to share part of our design specifications with Cooke Optics Ltd to ensure that Angénieux anamorphic zooms will match with future Cooke anamorphic primes and can be used together.

The colorimetry is part of the DNA of Angénieux products. I am also convinced that because of the big improvements in the new digital cameras with their large, sensitive sensors, it is now possible to make a full movie only with zooms. I'm not sure that cinematographers are ready to accept that immediately. But, when you look at the quality of the zooms, I really think it is possible now, unless you are in a situation with very low light. Our three anamorphic zooms will cover from 30 mm to 240 mm.

And you mentioned something like 50-500 mm in the future…

This will probably be a completely new design. It will not be a compact zoom, but rather a studio zoom. We still want to discuss the need for such a product with users. In reality, many Scope movies are already using Angénieux 25-250 or 24-290 mm zooms with an anamorphic adapter and the resolution is quite good. We would like feedback from cinematographers and users before making the decision to develop a 50-500 mm anamorphic zoom.

You said that Scope was very important to the future. Why?

This is something I discovered after I arrived at Angénieux. I really think that it adds something special to the image. There is an almost magical, aesthetic quality with this format in comparison to our standard formats of 4:3 and 16:9. You have much more latitude. I think this is a great help to creativity and the art of cinematography. Watching several anamorphic films recently, I was convinced that a larger screen can really help in displaying a more beautiful image and expressing stories in a different manner. You don't have to shift or cut from one face to the other for dialog. You can have two or three people in the same scene.

When you ask people what is the difference between anamorphic and spherical, many say it's the bokehs or the blue streaks. And when you question the more technically-minded, it's something not easy for them to describe. When I look at a movie in this format I really appreciate it. This is just my personal opinion. Until now, shooting in Scope was quite expensive. You needed expensive equipment. You needed expensive lenses and they were often in limited quantities. However, I'm sure that a lot of younger Directors and Cinematographers dream of being able to shoot in such a format. I really hope that with these new Angénieux products we will help them to realize their dream.

Some say that the anamorphic look is not necessarily about oval bokehs, and maybe only 10 people in the audience will notice and they'll be DPs. It's more an identification of anamorphic. It is a signature of some anamorphic images. But considering the new technology and the way people are shooting, this is not the most important aspect of anamorphic. It almost gives you a 3D quality about the image. It gives you more depth.

You said that Angénieux is putting humanity into the product. What do you mean by that?

The fact that Angénieux has been working in the cinema industry for years and years becomes very important. An optical designer comes with years of optical design experience. But the job is not only pure optical calculations. It also involves polishing and specific chemical surface treatments. The designers at Angénieux are not systematically targeting purely theoretical parameters. They are also trying to take into account the look and aesthetics. They have simulating tools that help them rapidly check how the final result will look on the screen and to ensure a natural look. All this is what I call the "DNA" of Angénieux products.

Angénieux has always been working like that. Originally we had in our books, and now we have in our computers, more than 2,000 particular combinations. These serve as the basis for new technical designs. We are fortunate to have a cinema studio next to the company, which helps us make direct image assessments with the latest professional cameras.

We can very rapidly produce new prototypes and do practical shooting in a real studio, under real-life conditions, and then see the results. This feedback between what the optical designers envision and what we see is very important.

This year there seems to be a move towards maybe not so perfect lenses because either the digital cameras are unforgiving or, as some have said, they are all looking pretty much the same. So it's up to the lens to help provide the unique look cinematographers are searching for.

You are absolutely right and it is a question of compromise. All lens designs are ultimately a compromise of look, resolution, cost, size, weight, speed. Pushing for maximum resolution may not always be the best way. At Angénieux, we have chosen to maintain a superb level of resolution while keeping what we call humanity in the image. We also take into account something important for the customer: a friendly, usable, compact and lightweight product. All this is a compromise. You can have the perfect optical design, but it will be a very expensive, very heavy product. And in the end, the result may not be very good for the spectator. ☐