Jon Fauer's www.fdtimes.com October 2010 Special Report

FILM AND DIGITAL TIMES

The Journal of Art, Technique and Technology in Motion Picture Production Worldwide

Leica
from First Camera to Che to Cine Lenses

Leica
35 mm
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65 mm
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Leica Cine Lens Saga

This is the saga of how a new set of cine lenses was conceived and developed. It's a story of concepts and a compelling cast of characters. It involved 5 years of research, development, and investment—and came together almost like a movie, beginning with a bold idea, followed by the gathering of a team to design, produce, distribute, and market the lenses.

The lenses that could not be named at Band Pro's Open House in December 2009 bore the unmistakable Leica logo at NAB 2010.

These are the first Cine lenses in the history of Leica.

The new Leica Summilux-C ("C" as in Cine) are all close-focus, T1.4, lightweight and small: 95 mm front diameter, and weigh between 3.5 and 4.0 pounds (1.6-1.8kg).

They should be ready to ship later this year in focal lengths of: 18, 21, 25, 35, 40, 50, 75, and 100 mm.

Additional focal lengths will be available later on, making up a total of about 15 different focal lengths, ranging from 12mm to over 150mm. Band Pro is the exclusive worldwide distributor.

Multiple aspheric elements are responsible for the small size and light weight. All Leica Summilux-C lenses share uniform spacing of focus marks from infinity to 6 feet. You will not have to recalibrate wireless focus scales or swap follow focus discs.

Furthermore, the lenses all share uniform length and placement of focus and iris rings—which is helpful for quick lens changes.

They all have a 95 mm threaded lens front. A threaded ring at the rear of the titanium PL mount permits quick and clean mounting of nets—no more snot tape needed to glue stockings behind the lens.

The Leica T1.4 primes use a multi-aspheric design and high-precision cine lens mechanics to provide uniform illumination across the entire 35mm frame and suppression of color fringing up to the extreme corners of the frame.

The Leica Summilux-C lenses were developed by CW Sonderoptic Wetzlar, a 100% subsidiary of ACM Project Development Company, whose Managing Director is Dr. Andreas Kaufmann. He also happens to be the Chairman of Leica Camera AG.

The other principal players in the project were Christian Skrein, photographer, filmmaker, collector and longtime friend of Otto Nemenz, President of Otto Nemenz International; and prominent lens designer Iain Neil.

Band Pro was brought on board in December 2009 as the exclusive worldwide distributor.

Alfred Schopf, who many of us remember from ARRI, is Chairman of the Board of Leica Camera.

Erik Feichtinger is Managing Director of CW Sonderoptic. Erik was former Investment Manager at Global Equity Partners in Vienna.

Leica Summilux-C lenses are available exclusively from Band Pro, with delivery scheduled for end of 2010. The first 25 sets of lenses will be delivered to Otto Nemenz International.

Dr. Andreas Kaufmann: Managing Director of ACM Project Development

Alfred Schopf: Chairman of the Board of Leica Camera

Erik Feichtinger: Managing Director of CW Sonderoptic

Christian Skrein: photographer, filmmaker, collector

Otto Nemenz: President of Otto Nemenz International

Amnon Band: President of Band Pro Film & Digital

Iain Neil on Leica Summilux-C Lenses

Iain Neil is a international, multi-talented optical designer, currently living in Lugano, Switzerland. He was born in Scotland, graduated from Strathclyde University in Glasgow in 1977 with a B.Sc. Honors degree in Applied Physics, awarded Alumnus of the Year in 2003 and made Visiting Professor to the Department of Physics in 2004. Along the way, he won more technical Oscars than anyone else, and has been issued or applied for over 150 worldwide optically-related patents.

His association with Leica goes back over 30 years. He worked for Barr & Stroud Ltd. Scotland (now a division of Thales), as Head of Optical Design. The company had associations with Leitz Wetzlar. He then was employed at Ernst Leitz Canada Ltd. (now Raytheon ELCAN Optical Technologies Ltd.) as Manager, Systems Engineering. Most cinematographers, of course, will remember Iain from his eighteen years at Panavision Inc. as Executive Vice President, Research & Development and Optics, and Chief Technical Officer. At Panavision, his work included the design and development of the Primo series of spherical and anamorphic lenses, video systems, viewfinder optics, HDTV optical systems, compound zoom lenses, and much more.

Iain Neil has known Otto Nemenz for more than 22 years—through his connections at Panavision. When Otto first started in Hollywood he worked in the Panavision lens department, building anamorphic lenses under George Kraemer, who was the optics guru at the time. When Iain started at Panavision, he was sort of taking over from George, who knew Otto very well. After leaving Panavision, Iain moved back to Europe in 2005 and provided optical services from his company ScotOptix. His involvement with the Leica Cine Lens project began in 2007. I spoke with him by phone in Wetzlar recently.

Iain explained, "By 2007, Dr. Kaufmann, Christian Skrein and Otto Nemenz had come to the conclusion that there should be a project to make Prime Cine lenses. They had put the rough specifications together as to what kind of lenses these would be. They had already decided on prime lenses: it was a question of aperture, size, weight, resolution, etc. The general specifications had already been determined. It was market driven, answering the question, 'What's the right product for the film and digital market?' One key aspect was to consider cameras with both film and electronic sensors. It was to design lenses equally good for film or digital. The digital application became more important as time went on."

When Iain got on board, it was clear the first thing they needed to do was put together a top notch, world class team of experts to develop this kind of product. Leica had never been in the business of making lenses for cinema cameras. Yes, there had been modifications, but this was a new thing.

When Andreas Kaufmann and Christian Skrein met with him, Iain said, "You'll need a team of people, not just one person."

When he heard the specs from Otto and Christian, Iain knew this was going to be extremely demanding—and that they needed a very, very strong team. They assembled a worldwide team, connected by phone, computer, and internet, to design the optics, mechanics and aspects of manufacturing. It was a first class group—they didn't want to be on the learning curve; they all had to know what they were doing. Iain explained, "When I looked at the speed (T stop had to be fast), the size (had to be small, reduced length and small diameter—compared to what existed at the moment), and feed in the requirements for film and digital, future-proof, good for the next 10-20 years—we had to come up with an optical design that corrects optical aberrations and reduces certain unwanted characteristics. This was not going to be a series of lenses that's just a mere improvement over what's been there before. This was a situation that happens every quarter century, where you can make a quantum leap in lens design as opposed to an improvement.

"To do that, we had to start from scratch, asking, 'How can we meet this target?' The base set of 8 lenses, from wide angle to long focal length, derive from a single optical design approach and construction. I created a new optical design, which is patent pending, and it covers the whole range of lenses. They all derive from one core optical design which involves using more than one aspherical surface. That's the key thing."

Iain was the optical designer. He spent thousands of hours, over a few years, using powerful computers and one of the most advanced lens design programs in the world. He also had to write a lot of additional algorithms and proprietary macro software. After several years, one of the major things they contended with was elimination of color fringing. On film, in the past, minor color fringing was less critical than on current high definition digital, which now has to be well controlled down to the pixel level. Color fringing has to be very carefully controlled: the number of elements in the lens, with different kinds of glass, push things to the limit. These new Leica lenses intended to squeeze in a small space as much glass as possible with virtually no air in between. "This would use up all degrees of freedom," Iain said.

The next big task was contending with shading, which is the light loss from the center of the lens to its outer edges. If you shoot against a white background or a cloudless blue sky, this shows up as a darkening circle, like vignetting, toward the edges. This can be up to 1 to 3 stops in older lenses. Electronic sensors are more critical in this respect, and the shading cannot be abrupt, suddenly happening at the corner of the picture.

Iain explained, "That was an enormous obstacle, especially for wide angle lenses. We achieved it with very little fall-off across the entire picture. And it had to be controlled for all focus distances. Even with our combination of aspheres, cramming everything into the small space, with our lens design coming together, the level of illumination remained very high.

"The other very big technical aspect, without getting into MTF, is that these lenses were designed to perform extremely well for not only 4K, but also 6K, 8K, and well beyond. Two major

Iain Neil on Leica, cont'd

things (besides distortion and a few other things) contribute to picture quality when you talk about camera resolution like 2K, 4K and so on. One is contrast and the other is resolution. Most cinematographers do lens tests by looking at a test chart that has black and white bars. You can put up a Baltar, you know, a really old lens from the 1950s, and you can say it's a 4K lens. But there's a difference.

"At whatever the resolution has to be for 4K, when you look at the contrast, how black the black is, how white the white is, for these black and white bars, when you measure it for a Baltar, you might get only 30% contrast. You should get ideally 100%, but the best you might hope for would be around 90% once you design and build the lens. Lenses from 20 years ago, maybe you get 40 or 50%. And this can vary over the picture, from center to edges. The point is, all these lenses are 4K. But then arguments go on over contrast—it's contrasty on axis, but not off…

"First, you've got to resolve your target. For a usable 4K picture, you've got to have high contrast. We are aiming for 6K, 8K with high contrast, and we're looking to set a new standard that will meet film and electronic sensor requirements for the future. This is not a gradual improvement, this is a quantum leap. When you invest in a set of lenses, you want to be sure your investment is future-proof for a good span of time, say at least 10 or more years. We're not in the game of coming out with a new set of lenses and 3 years down the road coming out with something completely different.

"There was one snag. It was a major thing. If you look at the trend in cine lenses in the last 20 years—the barrels got larger. Everyone has lenses that have barrels with a pretty large diameter. The main reason was for focus scale marks and how well spaced apart they were—particularly in the range from 6' to infinity. The scale there normally is a bit compressed, so it's a double whammy. You need a big diameter just to get more marks. So as a result, the lenses became bigger and heavier. If you make them a bit too big, you reach a point where it's even hard to get the lens out of the lens case and you might need three hands to do a lens change. From the user point of view, if it gets too big it almost becomes unmanageable. So if you have these big, heavy lenses in a big, heavy lens case, and you're outside on location, climbing a mountain…there are a lot of practical issues for wanting to make the lenses smaller."

The Leica Summilux-C designers understood this. They had a lens with great optical performance, jammed full of exotic glass, aspherical surfaces, all this great performance, but they now had a lens that was 20% thinner in diameter and 30 to 40% smaller in circumference. The focus scale was once again much smaller and much more difficult to use.

Iain came up with another invention. "I arrived at a unique way of solving, for the customer and the focus puller, a design arrangement using the optics and mechanics, where from 6' to infinity we're using half the available rotation, and from close focus to 6' is the other half of the travel. And that was our new design, which even though the diameter was 20% less, the spacing of the focus marks from 6' to infinity is 60% greater than on most other lenses. To achieve this kind of thing you need very good optics and mechanics, but that's why we put this strong team together. We had much more than a hundred years of combined experience on this team. The scale is even more expanded than on the largest diameter lenses.

"So that completely changes the direction of cine lens design. In the coming years, everyone will want to do this. And not only did we make the scale expanded, we went one step further. We also made it the same for every lens in the set, between 6' and infinity. The feel is the same from lens to lens in the entire set. The scales are all virtually identical. This is especially handy when you put the lens on a crane with a remote head, so the remote focus scale is the same. This was a unique invention in the package of many new and powerful benefits out of these small, breakthrough lenses.

"We were aware of the 3D trend, but this didn't come up at the beginning. It came up later in the design phase when we realized that 3D was no longer a fad, but that the studios needed something else. Smaller and shorter lenses, with a factor of about two times less weight, and much smaller, are especially suitable for shooting with two cameras on a rig."

In realizing this project, there were three key factors in making the large leap in lens logistics. They needed to know the market. They needed the general specifications: not a luxury car, but a Formula 1 custom racing car. And they had to design new software to do it. Most important, they needed an investor for this long-term project who had to be committed, determined, and believed the goal could be achieved. He had to be willing and able to put money down and stick with it. That was Dr. Andreas Kaufmann.

Iain said, "This is the kind of thing that only happens a few times every century. One of the previous quantum leaps in cine optics was the development of the early cine zoom lenses by Angénieux and Cooke, followed later by the Panavision Primo high end zoom lenses. They were made possible partly by advances in lens coatings and the advent of computers. Remember, before that, lenses weren't coated, so if you had all these lens elements, by the time the light hit the film there wouldn't be any light left at all. The Cooke Triplet was revolutionary in 1893, but it would have taken over 1 million man-hours to design a modern zoom lens back then: that's one man working a million hours, or a million men working one hour. These were positive, breakthrough, disruptive technologies in optics. These were huge events."

The key players were Dr. Andreas Kaufmann, Managing Director of ACM, CW Sonderoptic, Chairman of Leica; Christian Skrein, photographer, filmmaker, collector, longtime friend of Otto Nemenz, President of Otto Nemenz International; and Iain Neil, optical designer.

Iain explained, "Another company might have gotten stuck, or done something not as brand new. Or they would have done what some other companies have done, made conservative lenses that wouldn't be as good or future-proof.

"In addition to all that, to the multiple aspheric surfaces, we've added both a thread in the front for screw-in filters, and at the rear, for net or gel holders. The iris closes all the way down—this is helpful for electronic cinematography. And finally, the proof is in the pudding, as we say. These lenses have exceptional image quality, resolution, contrast, without shading (fall-off). Skin tones have a pleasing, pleasant look. In summary, we tried to balance all of the specifications. The key features balance the market requirements, specifications and technology."

Christian Skrein with the oldest known existing vintage print of Che Guevara taken by Alberto Korda in 1960. It is considered to be the most expensive historic print in the world.

From the Christian Skrein Collection.
www.christianskrein.com

Christian Skrein on Leica Summilux-C Lenses

Christian Skrein was born in Vienna. At age 17, while still in school, he bought a used Leica camera and a used Bentley. The door of the Bentley was emblazoned "Christian Skrein Photography." He was in business.

Specializing in high fashion for Vogue magazine and high society photography, Skrein became friends with fellow creative troublemakers, including the Beatles, the Rolling Stones, Andy Warhol, and Christo. He photographed Catherine Deneuve, Gina Lollobrigida, Grace Kelly, Sean Connery, and many other actors.

In 1968, at age 23, Skrein began shooting film. In 1970, he opened a film production company, Skrein Films, with offices in Vienna, Milan and Hollywood. For a Tyrolia binding commercial, he hired Herbert Raditschnig, the famous Austrian skiing and mountaineering cameraman. It's a small world. Otto Nemenz was Herbert's camera assistant (not on that job—Otto was once described by Herbert as the world's only Austrian who was not a world-class skier). When Otto opened his rental house on Sunset Boulevard, Jon Fauer followed in his footsteps working with Herbert—mostly on ski films.

Since 1968, Christian has been collecting photographs. He now has one of the world's largest collections, with over a million photos. (www.christianskrein.com)

In 1990, he became an industrialist with holdings in 72 factories, including the textile mills that made most of the world's Loden fabric (heavy, water-resistant, olive-green wool used in traditional alpine clothing). With a combined population of 25 million Loden-wearing customers in Bavaria, Austria and Switzerland, this was clearly more lucrative than shooting even the highest-end commercials.

He sold his companies in 2001, and went back to his photography collection. All the while, Christian and Otto Nemenz remained great friends. They talked on the phone at least once a week for the past 38 years. With common interest in cameras, optics, and cinematography, they often discussed the ideal lens for cinematography—for them, an unfulfilled dream.

In 2005, Austrian photography aficionado, businessman and former professor Dr. Andreas Kaufmann became the majority shareholder of Leica AG through his company ACM Projektentwicklung GmbH, Salzburg, Austria. Previously, about a third of Leica was owned by the French fashion house of Hermes.

Dr. Kaufmann is interesting. He helped start Germany's environmental Green Party in 1979 and taught history for 15 years. He was so committed to rescuing the ailing Leica company that, by 2006, he owned 96.5% of its shares. (The rest was publicly traded on the Frankfurt exchange.) Part of Dr. Kaufmann's estimable wealth came from a paper manufacturing company that belonged to his family for 101 years, where, small world again, Otto Nemenz's father managed accounts in the Middle East and Orient.

So, back to 2005. Christian Skrein met with Andreas Kaufmann. Skrein said, "You're a solid, bright industrialist and Leica is a world famous company, as we know, founded 1849 in Wetzlar. But never in history has Leica ever made cine lenses. Many after-market modifications have been done to Leica still lenses, rebarreled and re-housed, but never a cine lens. This is ironic because Oskar Barnack, designer of the first Leica still camera, made his first prototypes specifically to test motion picture film and lenses."

Dr. Kaufmann replied to Skrein, "Leica has manufactured over 1 million cameras and over 2 million still lenses—but you are right, not a single cine lens. The corporate philosophy had been, 'We don't want to get into these moving picture things,' and they didn't feel they had enough motion picture enthusiasts."

Christian Skrein said, "I have a concept and a friend in Hollywood, Otto Nemenz. He and I have had a dream for many years. Does it make sense?"

That evening in December 2005, Otto received a phone call.

Christian: "Otto, we have our dream."

Otto: "What dream? Leica lenses?"

Christian: "Yes, Leica."

Otto: "How is that possible?"

Christian: "We know the new owner of the factory."

The meetings began. The three Austrians drew up an initial list of seven parameters. The lenses had to be:

1. Lightweight.

2. Small in size .

3. T1.4 maximum aperture.

4. User-friendly focus and iris scales.

5. Fitted with a Titanium PL mount.

6. Greater than full frame cine coverage.

7. Easy for camera assistants to handle—easy in the hand.

The physical characteristics of the body were to be understated, elegant, without reflections. It should be easy to repair, simple to replace a front element, ideally in 25 minutes. This would not be easy because it's in direct conflict with light and small. It will be made even more difficult for the designer, because adjustment of tolerances is much easier in a large and heavy lens—but this set will be light and small. Multiple aspheric elements might be the way to achieve this.

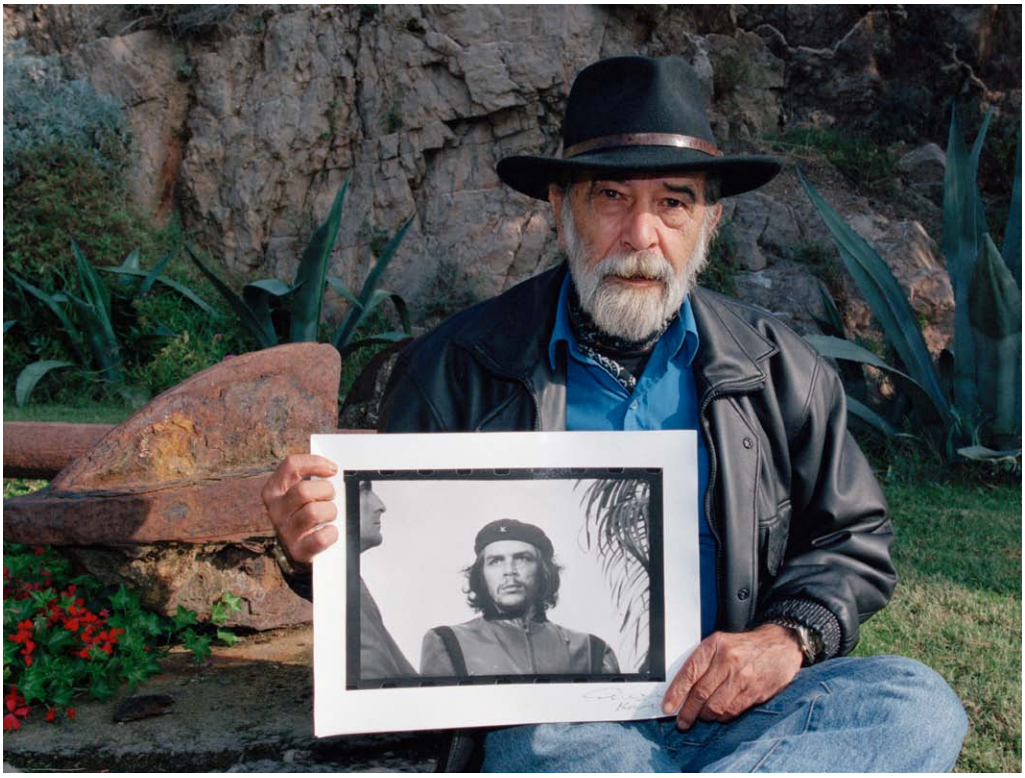
Although Leica has not built cine lenses before, there is a strong link to aspheric designs. Dr. Mandler, optical designer for Leica, used aspherics in the Leica 35mm Summilux-M f1.4 ASPH, as well as the world's fastest aspherical lens, the Leica Noctilux 50 mm f/0.95 ASPH and Leica Summilux-M 50 mm f/1.4 ASPH (called the best standard lens ever produced by DP Review).

The next question was, "Who is the best available lens designer in the world to do this?"

All roads led to Iain Neil in Lugano, Switzerland. Dr. Kaufmann invited Iain, Otto, and Christian for a meeting. With flip-charts and drawings, they drew up the plans. The charts showed the finished product specification—they understood the goal in advance. With a combined level of experience of over a hundred years, this international gang of four were no dummies. Optical design is acknowledged to be a series of informed compromises. It's a holy trinity of balancing cost, compromise and quality.

The emerging set of 8 primes average 17 elements, with at least two aspheric element surfaces. They are distributed exclusively by Band Pro worldwide.

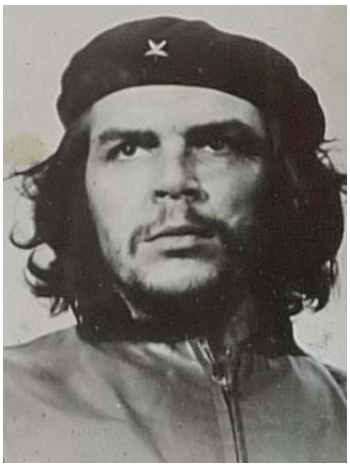
Leica: from Che to Cine Lenses

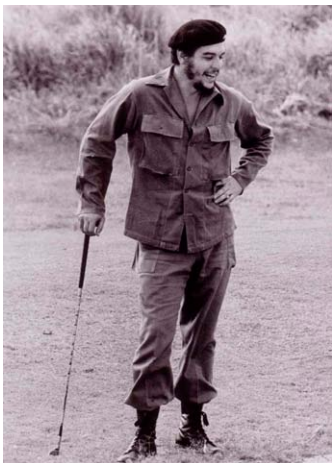


What am I doing in Wetzlar (above), sneaking around Solms, peering at pictures of Che? I'm learning all about Leica's new Summilux-C Cine Lenses: including provenance, production and people.

Most of us remember the iconic photograph of Che by Alberto Korda' (left). No other photo has been reproduced more often. Although the original print is in the Christian Skrein collection, it has been reproduced, silk-screened on t-shirts, painted, printed, sketched, and digitized more often than any other photograph in history.

Christian Skrein tells us that the original was shot March 5, 1960 with a Leica IIIf camera (not M2 as popularly reported), 90mm lens, on Kodak Plus-X Pan film.





Above: Ernsesto Che Guevara
Below: Leica IIIf

Alberto Diaz Gutierrez was born in the same year as Ernesto Guevara de la Serna: 1928. Alberto became a prominent fashion photographer in pre-revolutionary Cuba, and changed his name to Korda, apparently a fan of Hungarian-born, British film producer-director Alexander Korda (who changed *his* name from Sándor László Kellner).

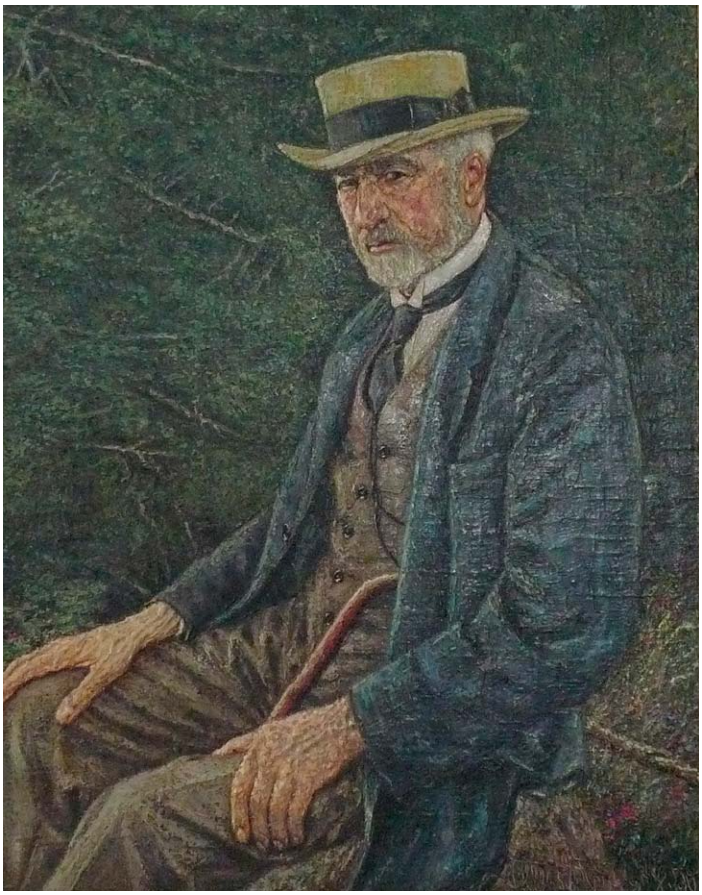
Ernesto was the earnest medical student from Argentina who became known as Che. See "The Motorcycle Diaries," sumptuously shot mostly handheld on Aaton Super 16 and 35 under difficult conditions by Eric Gautier, AFC. The film is about Che's early exposure to social injustice, before he became pop icon, supervisor of firing squads, or golf player. Korda's picture of Che playing golf (left) is not universally silked screened on T-Shirts. But we digress. This is a story about Leica.

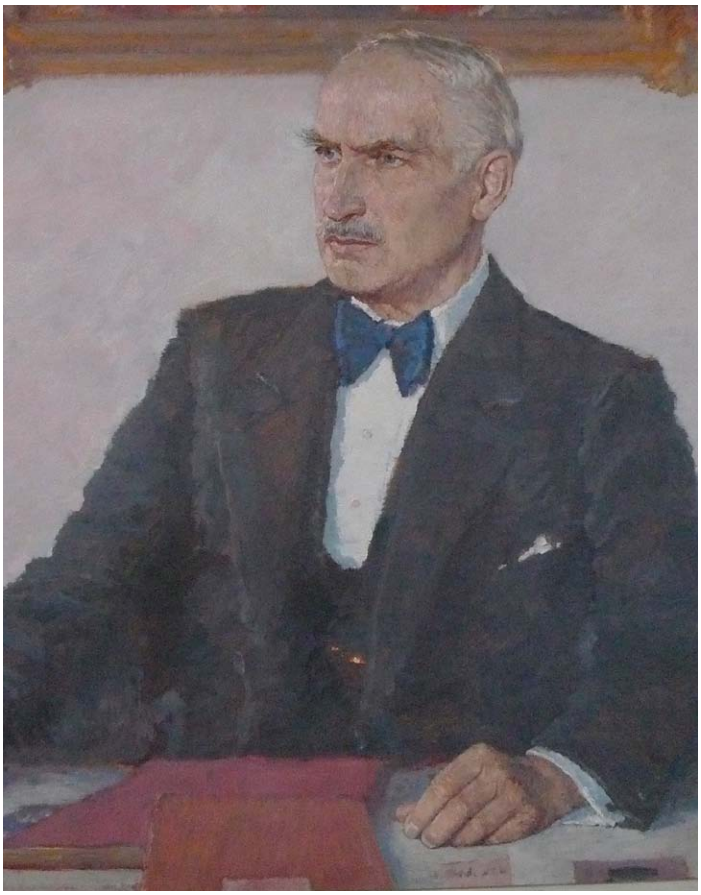
Leica. No other still camera captured the imagination or the events of the twentieth century more prominently than the lightweight, portable, practical cameras from Ernst Leitz GmbH Wetzlar. To millions of Leica aficionados worldwide, Wetzlar is the place name engraved on countless camera bodies, Summicron and Summilux lenses.

Surely, Wetzlar must be Leicaland, the Disneyland for camera fanatics worldwide, without tours, rides or tickets.

It's a short hour north of Frankfurt airport. There's a big white building that looks just like ZEISS in Jena, with a museum of microscopes located across the street in the city hall, past marriage certificates, to the right of traffic tickets.

Below, left to right: Ernst Leitz I (1843-1920), Ernst Leitz II (1871-1956)





But hang on, Leicas haven't been made in Wetzlar since 1986. Wetzlar is the headquarters of Leica Microsystems, where they make microscopes. It's a charming town, with good restaurants, a decent hotel (Wetzlarer Hof, no air conditioning in rooms, sweltering in Summer) and "Goethe slept here" signposts. For cameras, we drive another ten minutes east to Leica Camera AG at Oskar-Barnack-Strasse in the little village of Solms.

How does a camera or lens leap from concept to cult status, taking many of the world's most famous pictures?

The firm Optische Institut Wetzlar was founded by Carl Kellner in 1849, specializing in microscopes. Ernst Leitz became a partner in 1865. Oskar Barnack developed the prototype 35mm camera in 1913-14. It went into production in 1925. Leica (Leitz Camera) owners were passionate about taking pictures. Success came from the simplicity of a lightweight, portable, meticulously machined camera that enabled more people to photograph high quality images than ever before.

However, A funny thing happened in the 1980s. Leica was slow to respond to the digital revolution. Ironically, the company that helped bring photography to the world, along with Kodak, misunderestimated (as a former US President was fond of saying) the new paradigm of the ubiquitous image hunter-gatherer-sharer. Whereas Leica had sold cameras to almost every professional and prosumer on the planet, the new Japanese business model was to sell two affordable cameras—not just to pros—but to almost every inhabitant on digital earth.

Top: Leica factory in Solms

Below, left to right: Dr. Andreas Kaufmann, Erik Feichtinger, Christian Skrein

Leica's future was not assured until 2003, when an interesting Austrian, Dr. Andreas Kaufmann, purchased a Leica camera. A few years later, he went on to rescue the brand by purchasing 97.5% of the company. Today, Leica Camera is the one of the few companies still manufacturing still cameras in Europe. It is part the ACM Group, which also owns CW Sonderoptic, Viaoptic and the majority of Uwe Weller Feinwerktechnik. In 2010, Leica introduced a remarkable ten new products: including the S2 system, M9, X1, and the new Leica Summilux-C Cine Lenses.

Dr. Andreas Kaufmann with Leica M9

Alfred Schopf with Leica Summilux-C 40mm on finder

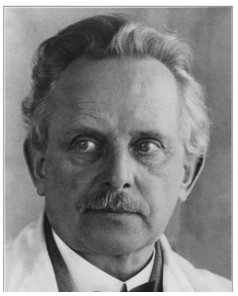
Above: Leica Summilux-C 21 mm Cine Lens on ARRI Alexa

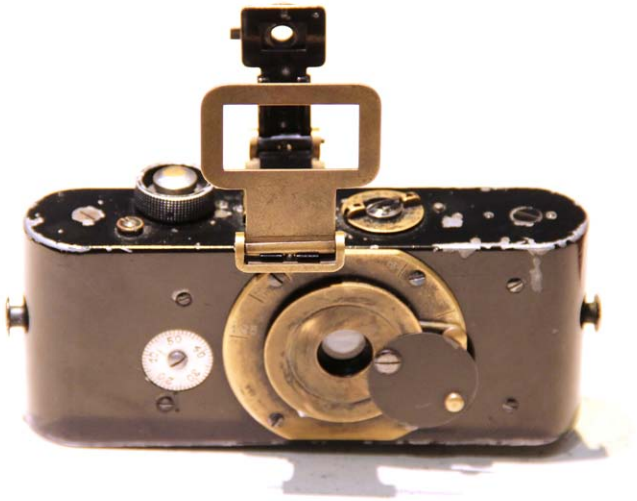
Below: Leica Summilux-C 21 mm Cine Lens on RED Epic

Above: Gerhard Beier, President of Band Pro Munich

Below: Leica Cine Lenses on display at IBC 2010

First Leica





A small town somewhere in Germany. Secure location undisclosed. Two matching keys open the safe deposit box. A small wooden case slides out of a soft velour bag. We put on white gloves. The box is opened. Inside is the first Leica ever made: the original 1913-1914 Oskar Barnack prototype 35mm still format camera, worth around 4 million dollars. No wonder it's in a vault. And they're letting me touch it.

Oskar Barnack was born in November, 1879. At age 22, he began working at Carl Zeiss in Jena. In 1911, he moved to Wetzlar to work as head of microscope R&D at Ernst Leitz Optical Works. In 1912, Barnack built a prototype 35mm motion picture camera constructed entirely of metal. The next step was to figure out a way to determine exposure. There were no light meters at the time: exposure was usually trial and error.

"What if we use a very small roll of the same 35mm film to test exposure," he wondered. "We could process it quickly in a small portable tank."

As we all know, motion picture film usually travels vertically, and the Silent Aperture format is about 18 x 24mm. That was a little too small for Barnack.

"What if we turn the camera 90 degrees, so the film travels horizontally...and use 8 perfs instead of 4? The negative would be 24 x 36mm—almost the same aspect ratio, and easier to view." That was the invention of the Leica format, also known as full-frame still format. Barnack called his first prototype, "Liliputkamera." It was later referred to as Ur-Leica (original, or prototype) until someone came up with the name "Leica," from Leitz Camera. It was the first small, portable, 35mm still format camera.

"Aha," Barnack must have said. "This is a lot easier to use than schlepping around a big, heavy view camera. Instead of contact-printing huge view camera negatives, we can use an enlarger to make larger prints. Oskar shot lots of stills with his prototype camera. Below, left, is one of the first, taken in Wetzlar's Eisenmarkt (Iron Market). Below, right, is how it looks like today, shot on a Leica D-LUX 4 f.3.5 at 1/400 sec, ISO 80, focal length 5.1mm.

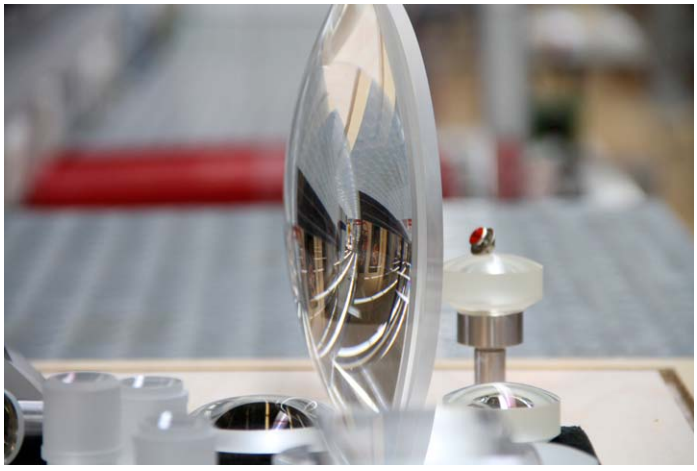
The first Leica A cameras went into production in 1925. The rest, as they say, is history. History continues, roughly 100 years after that first Leica prototype, with the company's first foray into motion pictures with the new line of Leica Summilux-C Lenses.

First Leica Cine Lenses

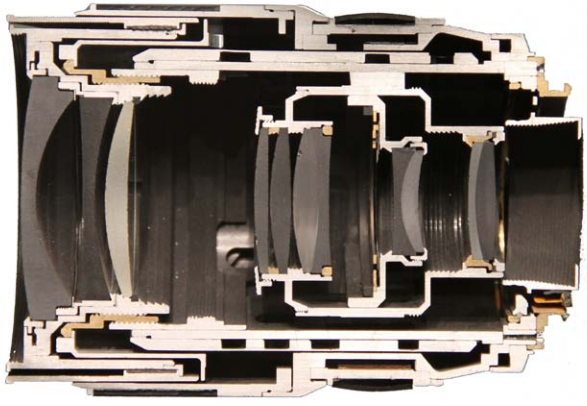
Leica Cine Lens Team at the front door of the Leica factory in Solms: Summilux-C PL Prime production was not brought to a halt for this picture. This was shot during a morning break, moments before our personal tour of the plant began. Wetzlar is practically on the same latitude as the other great optical cities of the world: Jena, Leicester, Rochester—a fortuitous confluence of climate (moderate, not too humid, glass cools evenly), resources (water and coal) and people (skilled industrial revolutionaries).

Lenses begin with a piece of molded glass, which then must be ground and polished. Winfried Arens, Lens Division *(left)*; and Rainer Schnabel, Production Manager *(right)*.

Leica chooses from over 40,000 glass formulas. Ulrich Schröder, Head of Cine Lens Assembly Team *(left)*; and Rainer Schnabel, *(right)* with finished Summilux-C lenses.

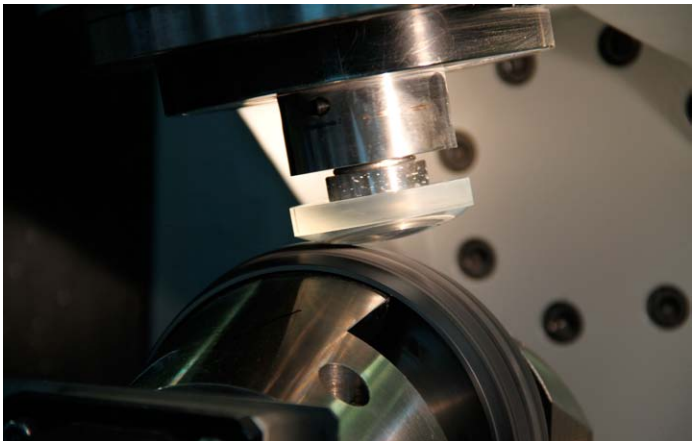


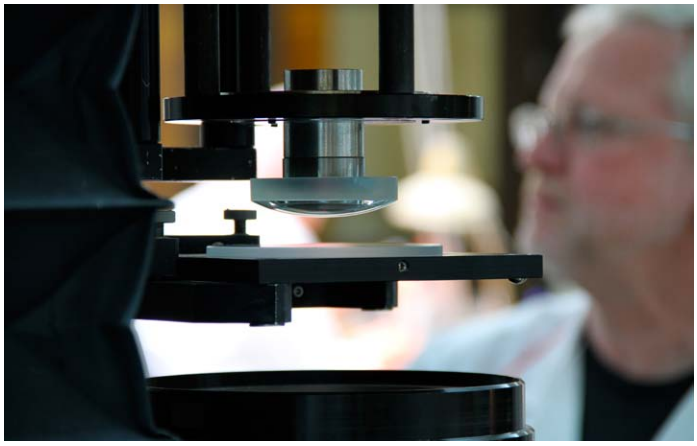
The first step is grinding, where the lens element takes shape. Precision is better than 1 micron (1/1000 mm). Next, the glass is polished—this is where it becomes optically clear.

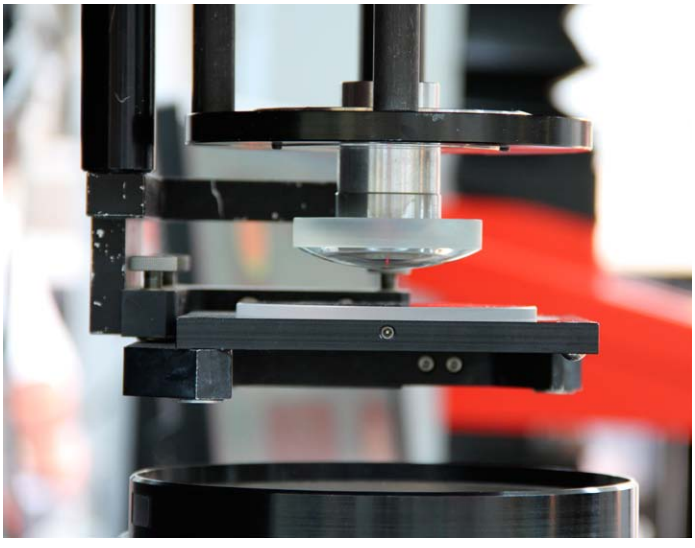


Leica has a long history with precision, multi-aspherical lenses. Here's a cutaway of a Vario-Elmarit 28-90mm ASPH f/2.8-4.5 with 2 aspherical elements.

First Leica Cine Lenses







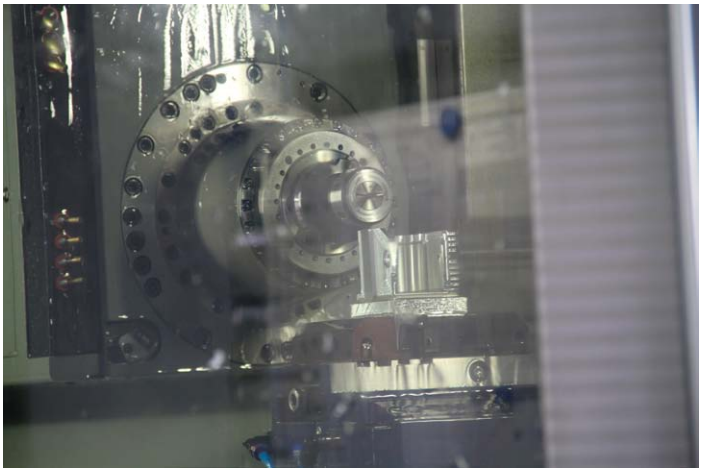
Aspherical lenses have complex curved surfaces—the radius of curvature changes according to distance from the optical axis. Aspherical lenses can concentrate all the light onto one point, provide superior correction of aberration, and improved resolution.

After grinding to a precision of 1 micron, the next step is the polishing. For aspherical lenses, the polishing machine uses a small rotating tool that travels in a very controlled way along the rotating element, "carving" the shape of asphere. It's a much slower, more accurate process than for spherical surfaces—accurate to several nanometers. Next, computer generated holograms measure the shape of the asphere to check for any deviations. The data is saved and loaded into the MRF (Magneto-rheological finishing) machines, which polish and correct any irregularities.

The new Leica Summilux-C lenses have a multi-aspheric lens design.

Uwe Weller

In 1994, Uwe Weller *(above)* took over the machining department of Leica Camera AG. Today, his company, with a staff over 100 and 60 CNC machines, specializes in high-end precision mechanics, serving optical, automotive, medical and aerospace industries. Weller manufactures most of the mechanical parts for Leica lenses, as well as parts for ZEISS and other optical companies. Weller calls this kind of outsourcing an "extended workbench." Most optical companies outsource their mechanical parts—lubricating oil, metal shavings, and anodizing chemicals do not cohabit easily with clean-room optical assembly. Of course, this was the cleanest machine shop I have ever seen—not a spot on the floor, not a speck of dust anywhere. Weller machines parts to a precision of 10 microns, working in titanium, aluminum and steel. Uwe Weller Feinwerktechnik GmbH, located in Wetzlar, is managed by Uwe Weller and Markus Limberger. It is a sister company of Leica and CW Sonderoptic. www.weller-feinwerktechnik.de



Leica Land

If you visit Wetzlar: the Hotel Wetzlarer Hof is within walking distance to the town center, restaurants, and the Leitz Museum. Better than the rooms is the hotel's airy terrace and excellent restaurant, above, right. www.wetzlarerhof.de

Bistro Cafe Restaurant Kaiser im Viseum is attached to Wetzlar's Viseum Museum of Optics and Fine Mechanics. The beer on tap is just the thing on a sweltering summer evening to accompany a plate of tagliatelle with arugola, cherry tomatoes and mushrooms or a filet of beef with pepper sauce and vegetables. www.kaiserimviseum.de Museum: www.viseum-wetzlar.de

At the Wetzalarer Hof Terrace, begin with a summer salad of grilled Shrimps in a nut dressing, followed by the mildest of venison, served with Spaetzle, fresh mushrooms, and a lingonberry sauce, or fresh salmon with cabbage in a Riesling sauce on rice with vegetables. For dessert, fresh fruit salad and ice cream. Quench your thirst on a dry Zweigelt Austrian red from Traisenthal with two other Austrians, Christian Skrein (*right*) and Erik Feichtinger (*left*). Erik, Managing Director of CW Sonderoptic, was our tireless tour guide to Leica, Wetzlar, Solms, and surroundings, as well as gracious restaurant expedition leader.

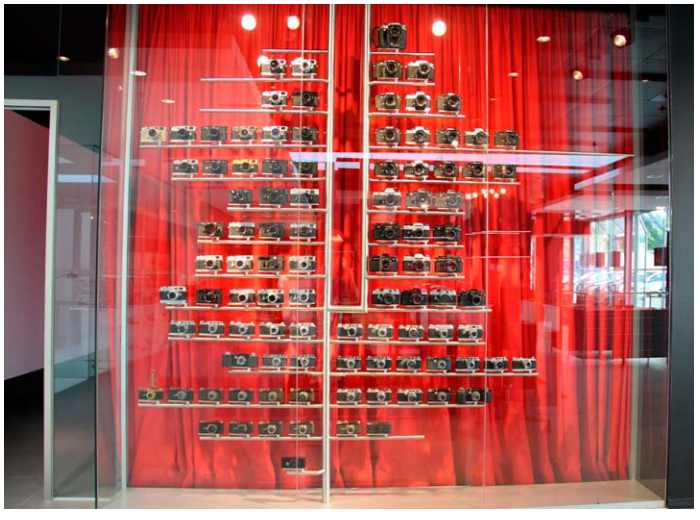
Braunfels is an ancient town perched on a hill above Solms. The castle was built in the 13th century. An excellent restaurant on the town square is Geranio, with some of the tastiest Vitello Tonnato and Saltimbocca north of Rome. www.ristorante-geranio.de

Around Wetzlar

The Leitz Microscope Museum is a large and largely unvisited afterthought in Wetzlar's Town Hall, attached by a bridge to the Leica Microsystems factory across the street—and definitely worth a visit for an in depth chronology on the history of optics.

Below: half-timbered Wetzlar.

Leica Stores, Boutiques and Galleries

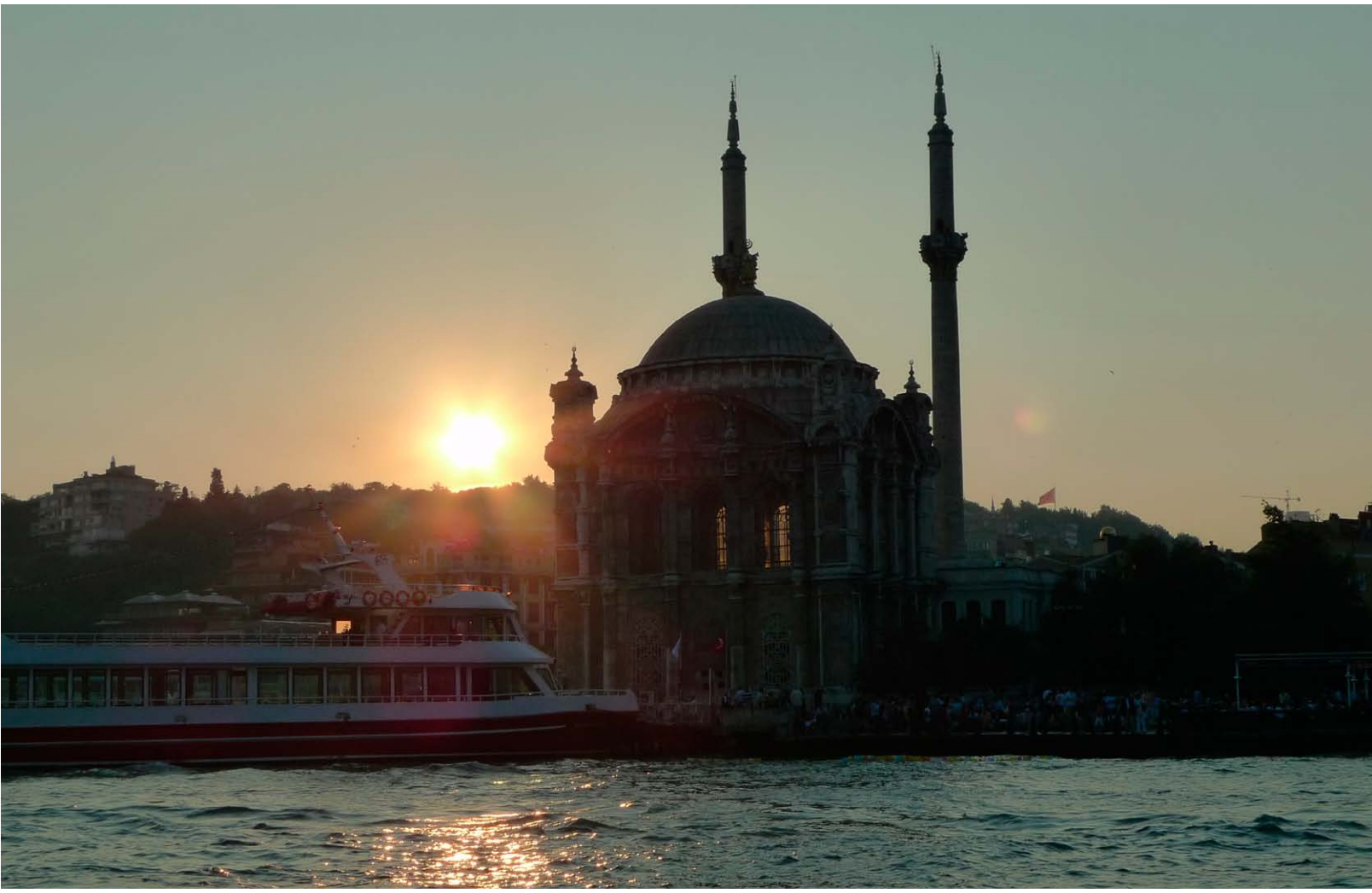


The entrance to the Leica factory in Solms is a reception area, Leica store and Leica gallery. Large displays of prominent photographs frame rich, red leather-lined display cases, redolent of Hermès. You can browse the gallery, drop off your Leica for repair, or spend your child's college fund on a new S2 system. But for Cine Lenses, you'll have to head over to a Band Pro office.

There are similar Leica stores in Miami, Moscow, Tokyo, Berlin, Warsaw, London, Paris, and Hamburg, with Leica Boutiques in New York, Oslo, Lisbon, Megève, and Fürth.

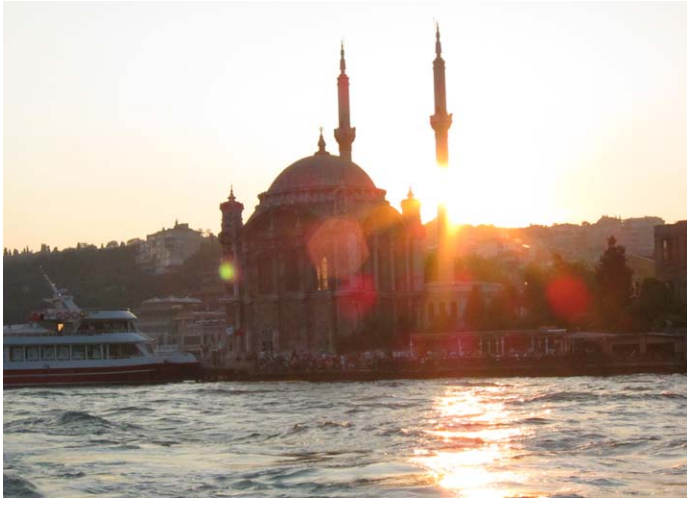
Leica galleries feature work done by photographers worldwide using Leica cameras or pictures that received recognition through a Leica cultural project. The first Leica Gallery was opened in Wetzlar in 1976 (now located in Solms), followed by additional galleries in New York, Tokyo, Frankfurt, Vienna and Salzburg and Istanbul. Next stop...Istanbul.

Leica in Istanbul



In February 2007, Leica Camera Group opened a Leica Gallery in Istanbul in co-operation with Istanbul Fotograf Merkezi (IFM) and Panatel Pazarlama, A.S., the official Leica agent in Turkey. The gallery is located in the heart of Istanbul.

Leica Gallery
Istanbul Fotograf Merkezi
Tarlabasi Bulvari No 272
34435 Beyoglu Istanbul



Istanbul. One of the world's great photogenic cities. It's the light: a mixture of humidity, salt spray, adiabatic winds whistling down the Bosphorus, and perhaps the endless spices wafted airborne from countless kitchens.

The picture at the top of the page was shot with a Leica D-Lux 4 at 1/1000 sec; f/5.6; ISO 125; at 12.8mm lens focal length. Notice the rich contrast and lack of flair, compared with the exposure taken at the same time with another rival high-end camera. Both shots were taken with factory default automatic settings.

Leica D-Lux 4 in Istanbul

Istanbul

The Leica Gallery is about 5 km from one of the world's great hotels: Istanbul's Çırağan Palace Kempinski, the last great Ottoman Imperial Palace. Traffic in Istanbul is like New York: after touring the spice market, Blue Mosque, Topkapi Palace and Aya Sofia, consider treating yourself to a Deniz water taxi.

Dine like a sultan in Tuğra Restaurant, overlooking the Bosphorus, in the renovated old palace. Chef Uğur Alparslan researches historical Ottoman food and combines it with modern variations and serious technique. A glass of Louis Roederer champagne arrives without fanfare. We begin with a selection of classic Ottoman Mezzes: eggplant salad, yogurt with mint haydari, stuffed zucchini flower and calamari, grilled fresh artichoke and stuffed vine leaves. Move to a main course from 1910 of charcoal grilled lamb with a sauce of pomegranate and onions, or a modern pistachio crusted lamb loin, with oven baked spare ribs, zucchini flowers filled with sweet pumpkin, and sweet and sour quince gravy. Sommelier and Assistant Mangager Hilmi Sarikaya uncorked for us a superb 2007 Turkish Sarafin Cabernet Sauvignon.

Leica Summilux-C Prime Lenses

Preliinary Technical Specifications

Focal Length	*Design*	*Aperture*	*Close Focus*	*Length Front to Flange*	*Length Front to Image Plane*	*Front Diameter*
16mm	Close Focus	T1.4-22-closed	0.35m / 1'2"	142mm / 5.6"	194mm / 7.6"	95mm / 3.7"
18mm	Close Focus	T1.4-22-closed	0.35m / 1'2"	142mm / 5.6"	194mm / 7.6"	95mm / 3.7"
21mm	Close Focus	T1.4-22-closed	0.31m / 1'0"	142mm / 5.6"	194mm / 7.6"	95mm / 3.7"
25mm	Close Focus	T1.4-22-closed	0.31m / 1'0"	142mm / 5.6"	194mm / 7.6"	95mm / 3.7"
35mm	Close Focus	T1.4-22-closed	0.36m / 1'2"	142mm / 5.6"	194mm / 7.6"	95mm / 3.7"
40mm	Close Focus	T1.4-22-closed	0.41m / 1'4"	142mm / 5.6"	194mm / 7.6"	95mm / 3.7"
50mm	Close Focus	T1.4-22-closed	0.50m / 1'8"	142mm / 5.6"	194mm / 7.6"	95mm / 3.7"
65mm	Macro	T1.4-22-closed	0.43m / 1'5"	142mm / 5.6"	194mm / 7.6"	95mm / 3.7"
75mm	Close Focus	T1.4-22-closed	0.70m / 2'3"	142mm / 5.6"	194mm / 7.6"	95mm / 3.7"
100mm	Close Focus	T1.4-22-closed	0.90m / 2'11"	142mm / 5.6"	194mm / 7.6"	95mm / 3.7"

- For PL Mount Film and Digital Cine Cameras
- Multi-Aspheric Optical Design
- High Resolution, High Contrast, Low Chromatic Aberration (full image)
- High Relative Illumination (minimal shading), flat-Field Illumination across the Entire Frame
- Even Image Quality over the Field of View, Consistent Performance throughout the Focus Range
- Linear Iris with Closed Position
- User-Friendly Focus Scales, Small Diameter Focus Scale
- Expanded Focus Mark Spacing in Critical Focus Range
- Consistent Focus Mark Spacing
- Compact, Lightweight, Ergonomic Design
- Uniform Small Diameters and Short Lengths
- Lightweight 3.5-4.0 lbs (1.6-1.8kg)
- Rugged Titanium Lens Mount
- Front and Rear Filter Capability

Actual Size

Leica Summilux-C 50mm Prime

Front Diameter: 95 mm / 3.7"

Length from Front to Flange: 142 mm / 5.6"

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