P+S TECHNIK

Optics for Exceptional Images

25+ YEARS

Made in Germany

Anamorphic Lenses

A brief look at a cinematic character

- Anamorphics de-squeezed
- Short history of anamorphic lenses
- TECHNOVISION Classic 1.5X
- EVOLUTION 2X
- Sensor size and anamorphic properties

Anamorphic Lenses

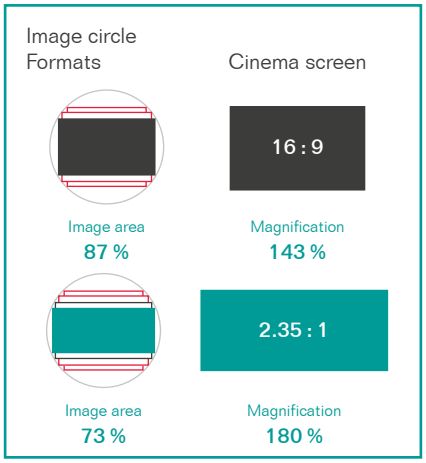
How to fit a rectangular in the circle

Optics are generally made up of multiple lens elements. Most lenses consist of rotationally symmetrical spherical shells or rotational spheroids. The projected image of those lenses is therefore also round. The optic consists of an inner circle of sharpness within which the projected image and image brightness consistently conform to the preset specifications, and an outer ring within which the optical image and the image brightness falls off towards the outer rim. Externally, the optical image is limited by the outer image circle, beyond which no light is thrown from the lens.

The rectangular image sensor – or earlier on a rectangular film frame – and their corners must be contained within the inner circle of sharpness. The sharpening circle must therefore always be larger than the image diagonal of the sensor or the film format. If you want to make maximum use of the sharpness of a lens, you would choose a square sensor or a square film format. We are most accustomed to square images in photography and painting, but not in cinema or on television.

The reason is that the cinema screen and the television screen are upright. Humans can now move comparatively easily in the horizontal, we can walk. While the movement in the vertical is much more difficult, we may climb a mountain or a tree, but we can't fly yet. It is for this reason that in cinema and on television, landscape images are preferred, i.e. the image width is larger than the image height.

The larger the ratio between image width and image height, the wider the projected image becomes, the worse the sharpening circle of the lens is exposed. Above and below the image format, even larger areas of the sharp image are left unused. If one considers these ratios for the square format (1:1) as the optimum utilization of the sharpness circle with 100%, then the 4:3 format uses the sharpness circle after all still to 96%. At 16:9 it is only 87% and at CinemaScope with 2.35:1 it is only 73%, less than three quarters.

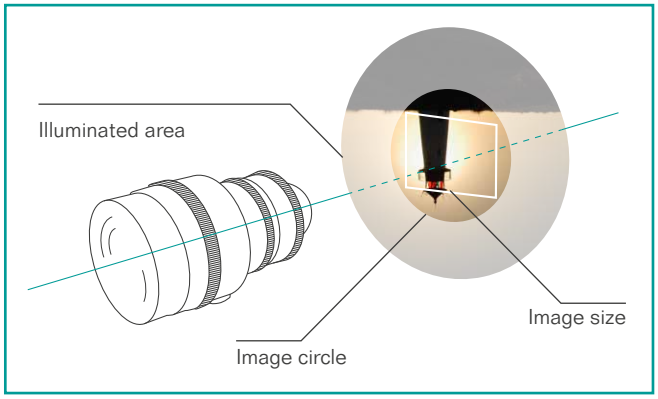


Schematics image circle and format

However, in cinemas, the projection screen cache (curtain) is only movable horizontally, i.e. the wider the image format, the more the image must be enlarged in projection. Historically, the projectionist had to use a projection lens with a shorter focal length for a widescreen 1.85:1 film rather than for a film in 4:3 standard format. This further reduces the sharpness, and the film grain becomes more visible. For the extreme aspect ratio of 2.35:1, it was therefore in the 1950s that the idea came up to choose the focal length in the horizontal by a factor of two lower than that in the vertical. This is only possible by anamorphic lenses, which are no longer built exclusively from rotationally symmetric lens elements, but also contain cylindrical glass elements. If cylindrical glass elements are placed in front of a lens, the result is still a round image, however it is now compressed horizontally by a factor of two. In classical film projection, this compression had to be reversed by an equivalent anamorphic projection lens. This resulted in a very wide image on the cinema screen, at the same time, the sharpness of the lens could be used very well and effectively, since the squeezed image on the film had an aspect ratio of 2.35:2 = 1.175:1 (almost a square). Due to its great compatibility with the 35mm film, the CinemaScope format prevailed in theaters.

Today in the digital world, it has become much easier to de-squeeze anamorphic images: the image is simply scaled horizontally by the appropriate factor. This can be calculated as an effect or simulated in the preview in the camera viewfinder. The great freedom of digital scaling thus allows the use of a wide variety of anamorphic factors. In practice, they range from 2:1 (cinemascope) over 1.5:1 to 1.33:1.

Anamorphic lenses are complex in design, they are heavier, and they are more expensive than spherical lenses. So, why should they still be used today, if the digital film projector projects anyway spherical?



Prof. Dr. Peter Slansky
Head of camera department at the Munich film school HFF

The answer is the anamorphic look. Even today, the typical anamorphic look of the image is often highly desired. The classical characteristics of this look are: First, the elliptical bokeh, (i. e. the elliptical blurs with defocused picture elements). Secondly, the barrel-shaped distortion most prominent in shorter focal lengths. Last, the line-shaped lens flares (horizontal streaks) with strong highlights in the picture. This "anamorphic look" is impossible to achieve by purely spherical lenses. For this reason, anamorphic lenses are still very popular with cinematographers. Digital technology has made the anamorphic format much easier to use.

Workflow with anamorphic lenses

The anamorphic projects a compressed image onto the film plane or an imaging sensor. During the capturing process, it makes sense to have the preview displayed again in the de-squeezed format. The negative (or captured media) may remain untouched by the preview for now.

In the past, many systems for widescreen imaging have emerged, some of which have been established and thus their aspect ratios standardized. For a corrected capture preview, a de-squeezed preview was necessary to the same extent that it was compressed. There were optical constructions in the viewfinder of the film camera and anamorphic projection lenses, which made it possible to de-squeeze a compressed image immediately for a final preview. The theatrical copy was usually de-squeezed during the screening by an anamorphic front adapter on the projector.

Nowadays everything after the negative is usually digitally processed, such processes are no longer necessary. Instead, the optical de-squeeze is now done digitally. For the preview, in most camera viewfinders as well as external monitor solutions, suitable software "superficial" de-squeeze can be selected. The workflow now can be as simplistic as working with spherical lenses alike.

Squeezed anamorphic image as projected on sensor and de-squeezed

If the lens information is also stored in the metadata, the editing program automatically recognizes the media format as anamorphic. If no metadata is detected, the image can either be de-squeezed manually or the pixel aspect ratio can be set as anamorphic. As an archival format, the film can then now be stored as a de-squeezed file.

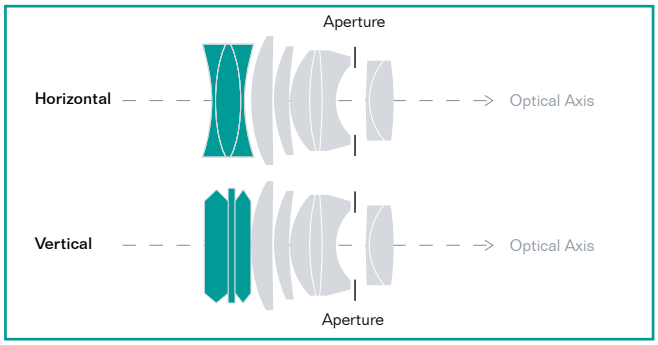
In contrast to the past, today the aspect ratio can usually be chosen stylistically. The de-squeezed image is given its aspect ratio by the chosen squeeze factor and the film gate or the image sensor aspect ratio. To meet an established distribution format, the ratio of the image area can usually be cropped to the desired format in camera or during the post-production process.

Anamorphic Lenses

Basic design principles for anamorphic lenses

FRONT ANAMORPHIC DESIGN

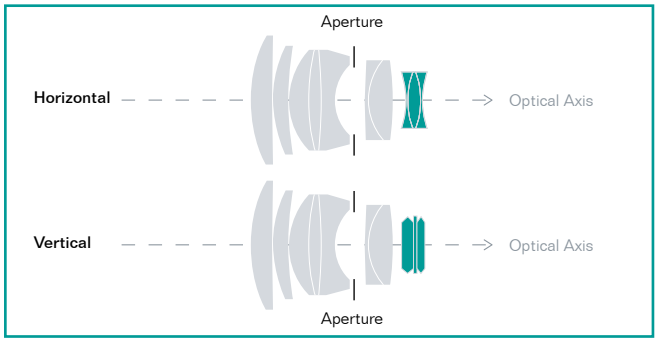
The optical design of front anamorphic lens originated at the birth of the beginning of anamorphic image acquisition when techniques like CinemaScope were developed. To achieve the squeezed recording on film, cylindrical elements were placed in front of the lens. Composed of a spherical glass block and then the aperture right behind. Due to physical reasons the so beloved “anamorphic look” with all its imperfections was created, consisting of the following characteristics: Horizontal streak flares, oval bokeh and a shallower depth of field compared to spherical lenses. The basic principle of front anamorphics hasn´t changed and is still today the most common optical design of anamorphic lenses.



Schematics of front anamorphic design

REAR ANAMORPHIC DESIGN

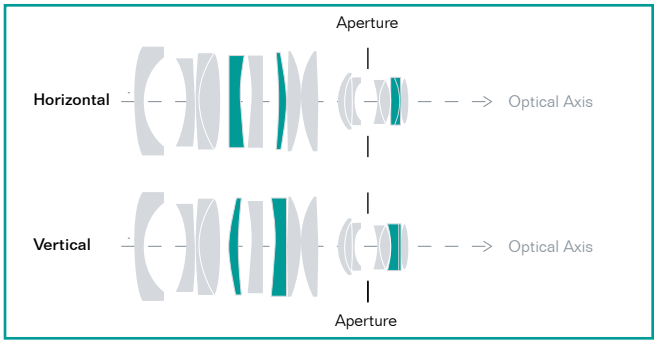
Rear anamorphic lenses are spherical lenses – mostly zoom lenses – that are equipped with a cylindrical element at the back which causes the relevant anamorphic squeeze. The squeezing happens behind the aperture, there’s none of the typical anamorphic characteristics such as; horizontal streak flares or elliptical bokeh being developed with this kind of lenses.



Schematics of rear anamorphic design

INTEGRATED ANAMORPHIC DESIGN

Integrated anamorphic systems; the anamorphic elements are aligned throughout the lens. The concept derived from the film times, when the lens should be technically and optically and as good as possible. Characteristics should be clean and as un-distorted as possible. This design concept produces a cleaner image with less distortion, but this also means to it will reduce the characteristics and popular creative choices from that of a front anamorphic lens.



Schematics of integrated anamorphic design

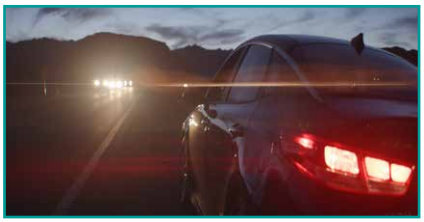
ANAMORPHIC ADAPTER

A budget option to shoot anamorphic with all its characteristics is to use front adapters. These adapters are attached in front of a spherical optic and therefore in front of its aperture. While this solution creates the desired flares and bokeh, the downside of this setup is that it created double focusing issues. Both the adapter and the spherical lens must be focused separately. Using a front anamorphic adapter may easily result in a slow and cumbersome workflow with varied results.

Due to the simple principle of a rear anamorphic design, there is a possibility to equip spherical lenses in conjunction with a special rear anamorphic adapter. When opting for this solution, one should take into consideration that rear adapters have construction limitations and limited compatibility. In using rear anamorphic adapters, it is preferable they should paired with long-range zoom lenses – see also anamorphic rear adapters.

Anamorphic look

Since anamorphic lenses optically compress the image horizontally, a larger image angle is obtained linear to the compression factor in this axis. Allowing the choice of longer focal lengths and the associated lower depth of field, the aperture remains the same. Since anamorphic lenses do not compress evenly throughout the image plane, images with a unique unsharp area (bokeh) are obtained.
Due to the combination of several lenses in an optic, artifacts repeatedly occur which are amplified by the anamorphic lens. The intensity and nature of these artifacts depends on the design principle of the optics. This is especially true in digital cinematography; the anamorphic is a look rather than a technical pre-requisite for producing widescreen images. This could be considered as an additional character in a moving image.
One of the most recognizable features of the anamorphic look is the horizontal streak next to the oval highlights and the distinct flares.



Horizontal streak

Anamorphic oval highlights

Wide angle with slight anamorphic distortions

Image design for wide screen

At the time of the introduction of anamorphic image acquisition in the 1950s, the technology was intended to be used for the epic films of this era. Times have changed, and today anamorphic lenses are more readily available than in the past. Music videos, commercials or documentaries: The fields of application have become more diverse. Working in a wider aspect ratio like 1:2.35 or 1:2.39 requires forethought of the way we compose the image.
This process begins when choosing the focal length. A 50mm anamorphic lens with a 2X squeeze factor offers vertically the same field of vision as a spherical 50mm lens. Whereas in the horizontal plane, the field of view is comparable to that of a spherical 25mm lens. This wider image gets closer to the natural human field of vision for which landscapes are most suitable.
However, shooting in small rooms with an aspect ratio of 1:2.39 can be appealing as well as the benefit of the horizontal angle of view, which shows more of the room without revealing the floor or the ceiling.
The wider field of view should also be taken in consideration when composing portrait shots as it can be challenging to concentrate on one person when the longer horizontal plane leads to seeing more people on the sides of the frame.

Still from dance video break·through
Director: Camila Martins, Cinematographer: Ludovica Isidori
Shot on P+S TECHNIK TECHNOVISION Classic 1.5X 40-70mm

Nevertheless, using anamorphic lenses doesn't necessarily require working with the wide aspect ratio of 1:2.39. When choosing lenses with a lower squeeze factor of 1.33 or 1.5 in combination with a 4:3 sensor it is possible to create a television compatible aspect ratio of 16:9 without renouncing to the characteristic anamorphic look.
Belgian cameraman Anton Mertens SBC decided to do so when he shot the sketch series KAFKA for Flemish TV station VTM on P+S TECHNIK's TECHNOVISION Classic 1.5X 40-70mm lens. Because of the 1.5X squeeze factor they could create an anamorphic 16:9 image coming from a 4:3 sensor.

Anamorphic Lenses

FILMED WITH TECHNOVISION

A selection

1979 Apocalypse Now
D: Francis Ford Coppola
DP: Vittorio Storaro

1984 The Neverending Story
D: Wolfgang Petersen
DP: Jost Vacano

1987 The Last Emperor
D: Bernardo Bertolucci
DP: Vittorio Storaro

1996 Evita
D: Alan Parker
DP: Darius Khondji

2005 The Interpreter
D: Sydney Pollack
DP: Darius Khondji

2012 Cloud Atlas
D: Tom Tykwer
DP: Frank Griebe

2013 A perfect man
D: Kees van Oostrum
DP: Joost van Gelder

2014 Grand Budapest Hotel
D: Wes Anderson
DP: Robert D. Yeoman

TECHNOVISION lenses since 1976

Since 1976 more than thousand feature films have been shot with TECHNOVISION lenses; following a list of the most important titles classified by the year of distribution and of which some managed to win the prestigious American Academy Award for, Best Cinematography. Recalling the famous, "...and the Oscar goes to …" resounding three times for Vittorio Storaro for Best Cinematography for "Apocalypse Now" in 1979, for "Reds" in 1981, for "The Last Emperor" in 1987, and for David Watkin for filming "Out Of Africa". TECHNOVISION anamorphic lenses were built around Cooke Speed Panchro optics, later following Zeiss High Speed and Distagon lenses.
Vittorio Storaro mixed them masterfully in "The Last Emperor" creating the warmer images with Cooke based lenses and the cooler images with Zeiss based ones. Thus resulting in bringing home as many as nine Oscars in total for the picture directed by Bernardo Bertolucci.
Anamorphic lenses are far from perfect optics, cylinder glass is difficult to handle and manufacture, but evidently TECHNOVISION managed to achieve an equilibrated product line.

Harald Buggenig, CEO D-Vision Rome,
managed the rental house TECHNOVISION Rome for over 25 years

Harald Buggenig

Vintage TECHNOVISION lenses

SNIPPETS OF ANAMORPHIC LENS HISTORY

	1927	1928	1952	1953		
	Henri Chrétien	Television	Cinerama CinemaScope	The Robe D: Henry Koster, DP: Leon Shamroy	Anamorphic Screening	20th Century-Fox Film Corp.
Anamorphic Squeeze Factor						
Notes	first anamorphic images			first feature film filmed with anamorphic lenses	1st anamorphic projection in cinemas	Honorary Academy Award for introducing CinemaScope

TECHNOVISION Classic LF 1.5X

A UNIVERSAL ANAMORPHIC LENS SERIES FOR FULL FRAME, LARGE FORMAT, 16:9 AND 4:3 IMAGE SENSORS

The TECHNOVISION Classic LF 1.5X lenses are the modern version of the well-known anamorphic TECHNOVISION lenses from the 1970s. They are designed to cover the larger sensor of cameras such as the Sony Venice, RED Monstro VV and the ARRI Alexa LF cameras.

These lenses offer the classic properties associated with front based anamorphic design such as unique oval bokeh, nicely formed horizontal flares, shallow depth of field and a superior wide angle of view. They are characterized by outstanding optical and mechanical properties.

What is so special about the Squeeze Factor 1.5X?

It is the best choice for larger sensors (3:2) by reaching an aspect ratio of 1:2.25, which is close to CinemaScope. This gives you the possibility using full sensor resolution for the wide screen project. It is a perfect match for 4:3 image sensors when an output of 16:9 distribution format is required. In other words, you get the anamorphic look into a 16:9 frame with all the creative benefits while using the full sensor resolution. The TECHNOVISION lenses are also ideal for the 16:9 image sensor capture by using the whole sensor resolution. This benefits the filmmaker in capturing the best possible digital negative with the least necessary cropping, if any, in post-production.

For more information visit:

http://technovision-by-pstechnik.de

https://vimeo.com/album/3570677

WHAT ARE THE ADVANTAGES OF THIS SERIES?

- Anamorphic cine lenses with large format coverage
- Organic anamorphic look
- State-of-the-art mechanical design and housing
- Universal 1.5X squeeze factor for cinematic images on 4:3, 16:9 and large format sensors

TECHNOVISION Classic lenses

1954	1955			1956	1957			
Color Television	American Optical/ Todd-AO	Ultra Scope	20th Century-Fox Film Corp and Bausch & Lomb Co.	Paramount Pictures	Panavision	Technicolor	Technirama	Todd-AO Corp. & Westrex Corp.
	2.20:1				2x, Super35	1.5x		
start of official transmission in the USA	70mm film Todd-AO	anamorphic capturing system for 35mm wide-screen films	Technical Academy Award for new CinemaScope lenses	Technical Academy Award for light-weight horizontal-movement Vista-Vision camera	Ultra Panatar lenses	Technirama	Anamorphic production system	Technical Academy Award for the wide-film motion picture method Todd-AO System

Anamorphic Lenses

Anamorphic solutions by P+S TECHNIK

Our solutions for anamorphic production range from: two series of anamorphic lenses including primes and zoom lenses, anamorphic rear elements for zoom lenses as well as lens servicing, restoration and professional rehousing for vintage anamorphic lens systems. Completed by selected 3rd party accessories for cinematographers and professional lens servicing and testing tools for service centers.

Anamorphic rear elements

VINTAGE & NEW

Anamorphic rear elements are a great solution for long range zoom lenses, whereas a front anamorphic design would produce an unbearably heavy and large lens. Even though rear anamorphic designs can't produce the characteristics or the, "anamorphic look" and bokeh; the images can be matched especially from the longer focal lengths were the effects are less intense in general.
P+S TECHNIK offers conversions for vintage anamorphic rear adapter as well as new 3rd party products.

Vintage lens rehousing, service and restoration

Vintage anamorphic lenses became more and more popular to counteract the clean look of today's modern digital sensors. To make these historic optics with their "unique looks" usable on a modern film sets, P+S TECHNIK provides lens servicing and restoration as well as professionally equipping lenses with new state-of-the-art mechanics and housing.

Anamorphic rear element for zoom lenses

KOWA Rehousing before and after

Broken cylindrical element and new replacement glass

SNIPPETS OF ANAMORPHIC LENS HISTORY

1958 | 1960 | 1970

	ARRI	Panavision	Total Scope	La Dolce Vita D: Frederico Fellini, DP: Otello Martelli	Kowa	Lomo
Anamorphic Squeeze Factor	2x, Super35				2x, Super35	2x, Super35
Notes	first feature film filmed with anamorphic lenses	Technical Academy Award for development of the Auto Panatar anamorphic lens for 35 mm Cinema Scope photography	anamorphic lenses, previous model of TECHNOVISION anamorphics	filmed with Total Scope anamorphic lenses	Cine Prominar Ananmorphic	Anamorphic

Evolution 2X

MOST COMPACT & LIGHTWEIGHT ANAMORPHIC CINE LENSES MATCHING VINTAGE KOWA ANAMORPHICS

Evolution 2X
matching KOWA Anamorphic

The Evolution 2X lens series were developed from our experiences with lens rehousing. We offer the only full rehousing; including complete replacement of the original mechanics, and equipping the lens with more durable parts while keeping the same compact form factor. The large number of request for spare replacement glass led us to reproduce the first cylindrical lens elements. This accumulation of knowledge allowed us to start to design a modern anamorphic lens series. The development of the lenses were inspired by the anamorphic look and benefits of the vintage Kowa Anamorphic lenses with the goal to match thus.

Due to their lightweight and compact form-factor, the Evolution 2X are the ideal anamorphic lenses for Steadicam, hand-held and drone camera work. The optical design of the Evolution 2X lenses is inspired by their original optical design. Including the front anamorphic principles with the goal to allow them to match and mix the classic lenses.

Based on the front anamorphic design concept, they produce a characteristic look; low in contrast, warm images and beautiful flares. In addition to the four original focal lengths, two focal lengths were made to extend the range: 32 mm and 135 mm.

For more information visit:

https://www.pstechnik.de/lenses/evolution-2x/

https://vimeo.com/album/4805836

WHAT ARE THE ADVANTAGES OF THIS SERIES?

- Most compact, lightweight anamorphic cine lenses, ideal for Steadicam, hand-held and drones
- New glass matches the genuine anamorphic look of vintage Kowa Anamorphics
- State-of-the-art mechanical design and housing
- Professional rehousing available for vintage Kowa Anamorphics
- Mix, replace or extend your vintage Kowa anamorphic set
- All spare parts and spare glass available
- Extended range with two added focal lengths: 32 mm, 40 mm, 50 mm, 75 mm, 100 mm, 135 mm
- 2X squeeze factor for cinematic widescreen images on classic 4:3 Super 35 sensors

1973	1976	1980		1990		1992	1993	2006
Todd-AO Corp.	TECHNOVISION	JDC	Cine-o-vision	P+S TECHNIK	Elite, JSC Optica Elite	Vantage	Panavision	Digital Cinematography
	2x, Super35	2x, Super35	2x		2x, Super35	2x		
Technical Academy Award for improved anamorphic focusing system	Anamorphic lenses under the name TECHNOVISION	Xtal-Express		Alfred Piffl founded the company		Hawk/Vantage, V-Lite	Technical Academy Award for the Auto Panatar anamorphic lens	

Anamorphic Lenses

Anamorphic lenses and Full Frame sensors

Selecting the right format for your creative choices is nowadays easier from the camera point of view. To choose the right glass is an important creative decision of the Director of Photography. P+S TECHNIK is proud to present lenses with strong characteristics for both Full Frame and large format.

From Scene to Scene you have only a few seconds to transport the message of your images to the audience. To control the image is a must. Remember when you change your lens choice from a 2/3 Digital Video Look to the 35Digital Look (first time available by P+S TECHNIK with the Pro35 image converter). Suddenly you could control your image by controlling the depth of field. Pointing your audience to follow your story in your perspective. Focusing (in the real meaning of the word) your audience to your story. This created the big screen, "Hollywood look". Nowadays single chip sensors are state of the art. Now we can go a step further with the larger sensors to control the focus of an image more with precision.

How the lens "paints" an image to the sensor is getting more important as we learned by using vintage lenses. Every lens has a character from, "total clean" to a "dirty look". In some cases, you may choose, "Perfectly clean Master Prime". In others, you may go with a super "flared" Meyer Görlitz or KOWA anamorphic lens.

WHY USE ASPECT RATIO 1:2.39 WIDE SCREEN?

To make it simple, it generates a more impressive image at the human eye. Independent from motive, it is closer to the basic aspect ratio of which the human brain and eye work together.

WHY USE LARGER SENSORS?

More and larger pixels on the sensor result in, (as we learned this also from the development of film stock), a better image from physical viewpoint, contrast and resolution.

2.39 CROPPED VS. 2.39 ANAMORPHIC

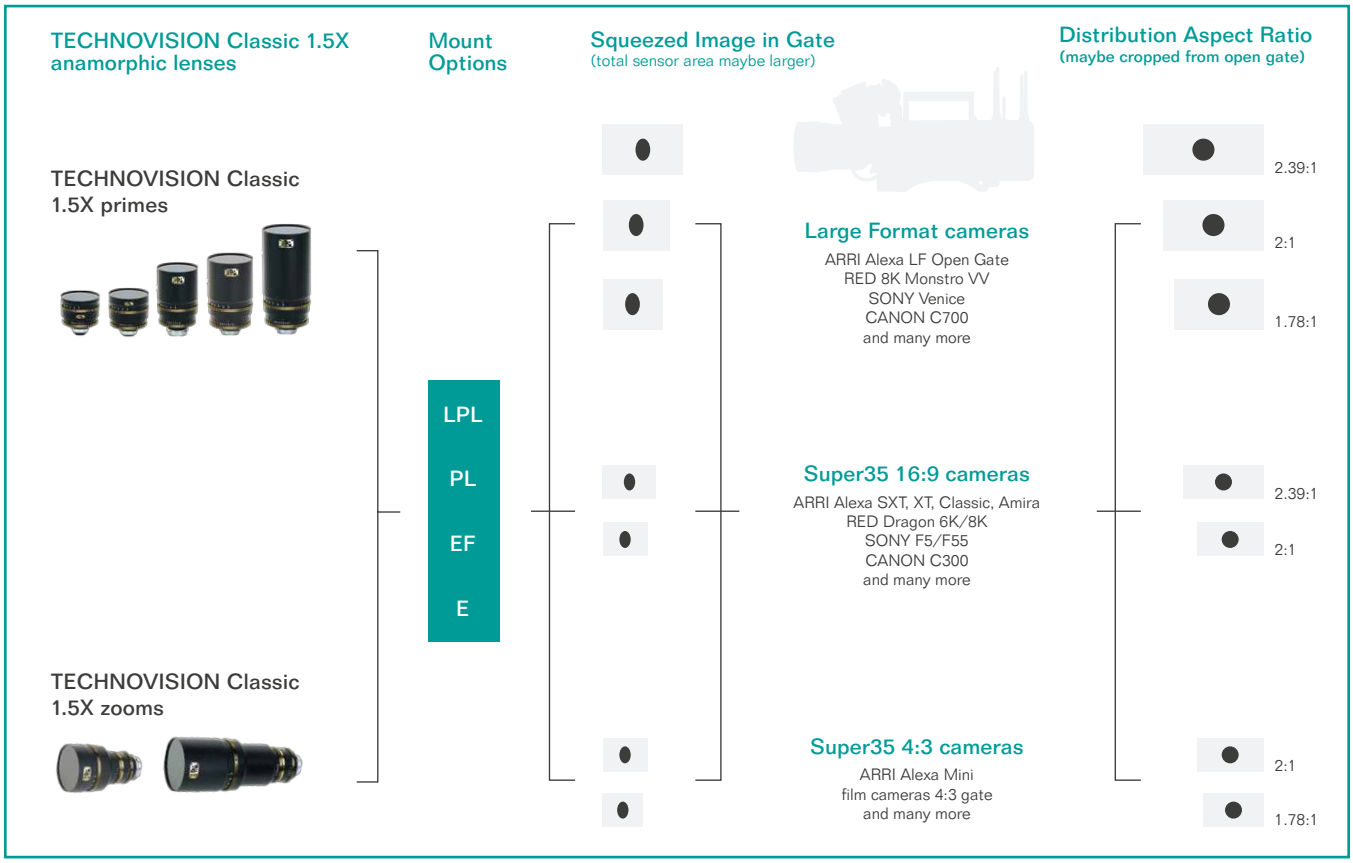
If your project needs a cleaner or flatter look in a wide screen format, using a larger sensor and spherical Full Frame lenses allows to crop 2.39 wide screen images with acceptable quality for most distribution formats. To produce the truly cinematic look of wide screen images with the beautiful soft look and characteristics of, "wrap-around" and "fall-off", anamorphic lenses based on the front anamorphic design are the lens of choice for the project.

2.39 WHICH ANAMORPHIC SQUEEZE FACTOR (POWER) TO CHOOSE?

From a creative viewpoint: the higher the squeeze factor, the stronger the anamorphic effect.
From a technical viewpoint the squeeze factor and the image circle (illumination) of a lens has great influence on the effective sensor area and source resolution that can be used.

SNIPPETS OF ANAMORPHIC LENS HISTORY

	2010	2012		2015	2016	2017	2018
	ARRI	Zeiss	Cloud Atlas D: Tom Tykwer, DP: Frank Griebe	Cooke Optics	Service Vision	P+S TECHNIK	P+S TECHNIK
Anamorphic Squeeze Factor		2x, Super35		2x, Super35	2x, Full Frame	2x, Super35	1.5x, Full Frame
Notes	First Alexa digital camera	Master Anamorphics	filmed with TECHNOVISION anamorphic lenses	Cooke Anamorphic/ i lenses	Scorpio Lens	Evolution 2X	TECHNOVISION Classic



WHY IS 1.5X SUCH A GREAT CHOICE?

At the time of negative film, the squeeze factor 2x is standardized to bring a cinema image (1: 2.40) on 35mm film stock. This format cannot be achieved with spherical lenses without great loss of image quality (resolution). The exposed area becomes very narrow and therefore little information can be “stored”.

The introduction of Digital Cinematography, filmmakers have now been given more freedom and options through various sensors sizes and formats. There are 4:3 and 16:9 sensors in various sizes, such as the Super35 or Full Frame, as well as some “intermediate models that vary in sensor sizes for both budget and creative shooting choices.

Most current existing amorphic lenses existing on the market are fine for 4:3 35 mm sensors. But not so perfect for 16:9 35 mm sensors. During the transition to Digital Cinematography the lens designer did not care for the new format 16:9. A new generation of 1:2 de-squeeze anamorphic lenses were designed for this reason over creative choice.

With the “new” Full Frame sensors we again have to start to design new anamorphic lenses and we should do this without compromise. A lens design and an investment in lenses was sustainable in history. In addition, it is easier to change the sensor format or frameline with a few clicks.

1.5X IS THE RIGHT ASPECT RATIO FORM DIFFERENT TECHNICAL AND CREATIVE VIEWPOINTS

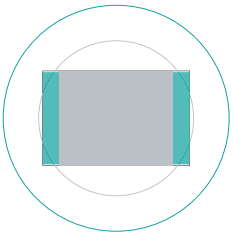
- 1.5x generate the typical anamorphic look
- 1.5x avoid the unwanted artefacts of a very strongly squeezed image (e.g. panning shots with 2x anamorphics)
- 1,5x more CGI friendly due to less distortion
- 1.5x work at 1.78 as well as 2.39 displays and sensors with very little compromise

1.5X – Universal choice for cinematic anamorphic look

used sensor area in % of total sensor surface and source resolution

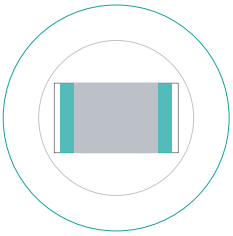
- camera sensor
- image circle TECHNOVISION Classic 1.5X, min. d=43,3mm
- image circle Full Frame 2x anamorphic lenses, d=37,4mm
- image circle average S35 2x anamorphic lenses, d=29,7mm (based on Alexa Mini Open Gate, 23,76 x 17,82 mm)
- used sensor area with TECHNOVISION Classic 1.5X lenses
- used sensor area with Full Frame 2x anamorphic lenses
- used sensor area with Super35 2x Anamorphic lenses

16:9 S35 SENSOR AND 2.39:1 DISTRIBUTION



ARRI Alexa SXT/XT Open Gate

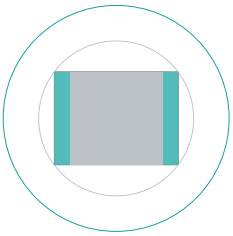
- **97 %, 3414 x 2143 pixel, 7,32 MP**
- 77 %, 2627 x 2198 pixel, 5,77 MP



ARRI Alexa Classic 16:9 and similar sensor size

- **90 %, 2581 x 1620 pixel, 4,18 MP**
- 67 %, 1936 x 1620 pixel, 3,14 MP

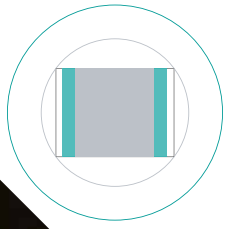
4:3 S35 SENSOR AND 2:1 DISTRIBUTION



ARRI Alexa 4:3 and similar sensor size

- **100 %, 2880 x 2160 pixel, 6,22 MP**
- 75 %, 2160 x 2160 pixel, 4,67 MP

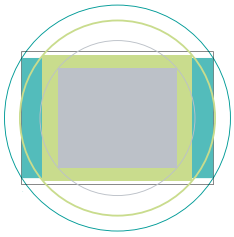
4:3 S35 SENSOR AND 1.78:1 DISTRIBUTION



ARRI Alexa 4:3 and similar sensor size

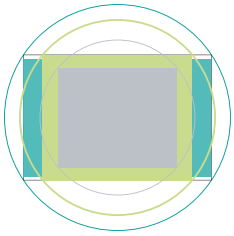
- **89 %, 2560 x 2160 pixel, 5,53 MP**
- 67 %, 1920 x 2160 pixel, 4,15 MP

LARGE FORMAT SENSOR AND 2.39:1 DISTRIBUTION



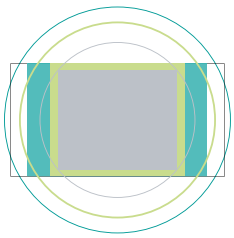
ARRI Alexa LF (4448 x 3096 pixel)

- **90 %, 4448 x 2792 pixel, 12,42 MP**
- 73 %, 3477 x 2909 pixel, 10,11 MP
- 46 %, 2761 x 2310 pixel, 6,38 MP



SONY Venice (6048 x 4032 pixel)

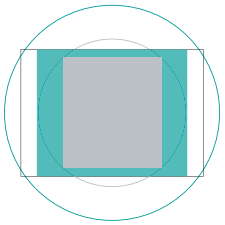
- **94 %, 6048 x 3796 pixel, 22,96 MP**
- 80 %, 4818 x 4032 pixel, 19,43 MP
- 50 %, 3828 x 3203 pixel, 12,26 MP



RED Monstro VV (8192 x 4320 pixel)

- **84 %, 6883 x 4320 pixel, 29,73 MP**
- 63 %, 5162 x 4320 pixel, 22,30 MP
- 49 %, 4555 x 3812 pixel, 17,36 MP

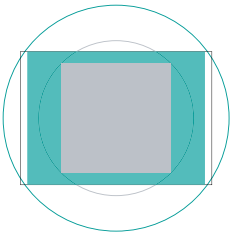
LARGE FORMAT SENSOR AND 1.78:1 DISTRIBUTION



ARRI Alexa LF

- **82 %, 3669 x 3096 pixel, 11,36 MP**
- 47 %, 2392 x 2691 pixel, 6,44 MP

LARGE FORMAT SENSOR AND 2:1 DISTRIBUTION



ARRI Alexa LF

- **93 %, 4128 x 3096 pixel, 12,78 MP**
- 47 %, 2546 x 2546 pixel, 6,48 MP

P+S TECHNIK GmbH Feinmechanik
Siemensstr. 12
D-85521 Ottobrunn b. München
Germany

Your local reseller:

+49-89-45 09 82-30
+49-89-45 09 82-40

sales@pstechnik.de
www.pstechnik.de

v1808