

# Line Scan Lens

## XENON-SAPPHIRE 3.2/96, beta' = -2.0 (-0.5 in retro)

This lens is a mechanically adapted version of the XN Sapphire - 0.5x lens in order to use it in retro orientation. It is broadband coated and can be used in the range of 400 – 1000 nm.

The V-mount makes it easy to install and rotate into the desired azimuth position for a wide range of high resolution applications.

The XENON Sapphire 3.2/96, beta' = -2.0x can be used for 12K as well as for 16K line sensors.

- F#3.2 is the maximum opening of the stop and provides maximum brightness. The mechanical vignetting at this F/number is approx. 10% at the edge of the field.
- F#4.2 and 4.6 show a very homogeneous MTF and practically diffraction limited performance over the whole field of 82 mm. The depth of field is bigger and the lens is quite insensitive to magnification changes within  $-1.85 < \beta' < -2.15$ . At 4.2 the lens is free of artificial vignetting.



XENON-SAPPHIRE lens  
beta' = -2.0

### Key Features

- for 16k line scan cameras (57.3mm length / pixel sizes 3.5µm and 82mm length / pixel size appr. 5µm)
- for 12k line scan cameras (62.5mm length / pixel sizes appr. 5µm)
- High resolution optics 400 - 1000 nm
- Robust mechanics for industrial environment
- Vibration insensitive
- Focus and iris setting lockable

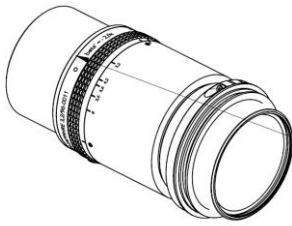
### Applications

- High-resolution 16k line scan applications
- 12k TDI inspection
- Machine Vision and other imaging applications with high throughput
- Flat panel inspection
- Quality control, etc.

Technical Specifications	XENON-SAPPHIRE 3.2/96-0011
F# range	3.2 – 8
Focal length	96.2 mm
Image circle	62.5 mm also suitable for 82 mm 16K
Beta'	-2.0 (-1.85 ... - 2.15)
Object to image distance	423 (412,5 ... 434)mm
Transmission	400 -1000 nm
Interface	Schneider V-mount 70
Weight	appr. 840 gr.
Code no.	1076451

Accessories		Code no.
Adapter V70 / M72x0.75	10 mm	# 1072419
Extension tube M72x0.75	5 mm	# 1072420
Extension tube M72x0.75	10 mm	# 1072421
Extension tube M72x0.75	25 mm	# 26406
Extension tube M72x0.75	50 mm	# 1054733
Extension tube M72x0.75	100 mm	# 1079483
Extension tube M72x0.75	200 mm	# 1079484
Adapter M72x0.75 / M95x1	4 mm	# 1077013
Extension tube M95x1	10 mm	# 1054733
Extension tube M95x1	25 mm	# 1062892
Extension tube M95x1	50 mm	# 1062893
Extension tube M95x1	100 mm	# 1062894
Extension tube M95x1	200 mm	# 1077291

# XENON-SAPPHIRE 3.2/96 (in retro)



Roter Punkt:  
Kennzeichnung vermittelter Azimut  
90° versetzt zur Zeilenrichtung.  
(Red dot, marking for best azimuth  
90° to line direction).

XENON SAPPHIRE 3.2/96 (in retro)

$f = 96,21 \text{ mm}$       $\beta'_p = 1,02$

$s_f = -47,48 \text{ mm}$       $s_{EP} = 46,90 \text{ mm}$

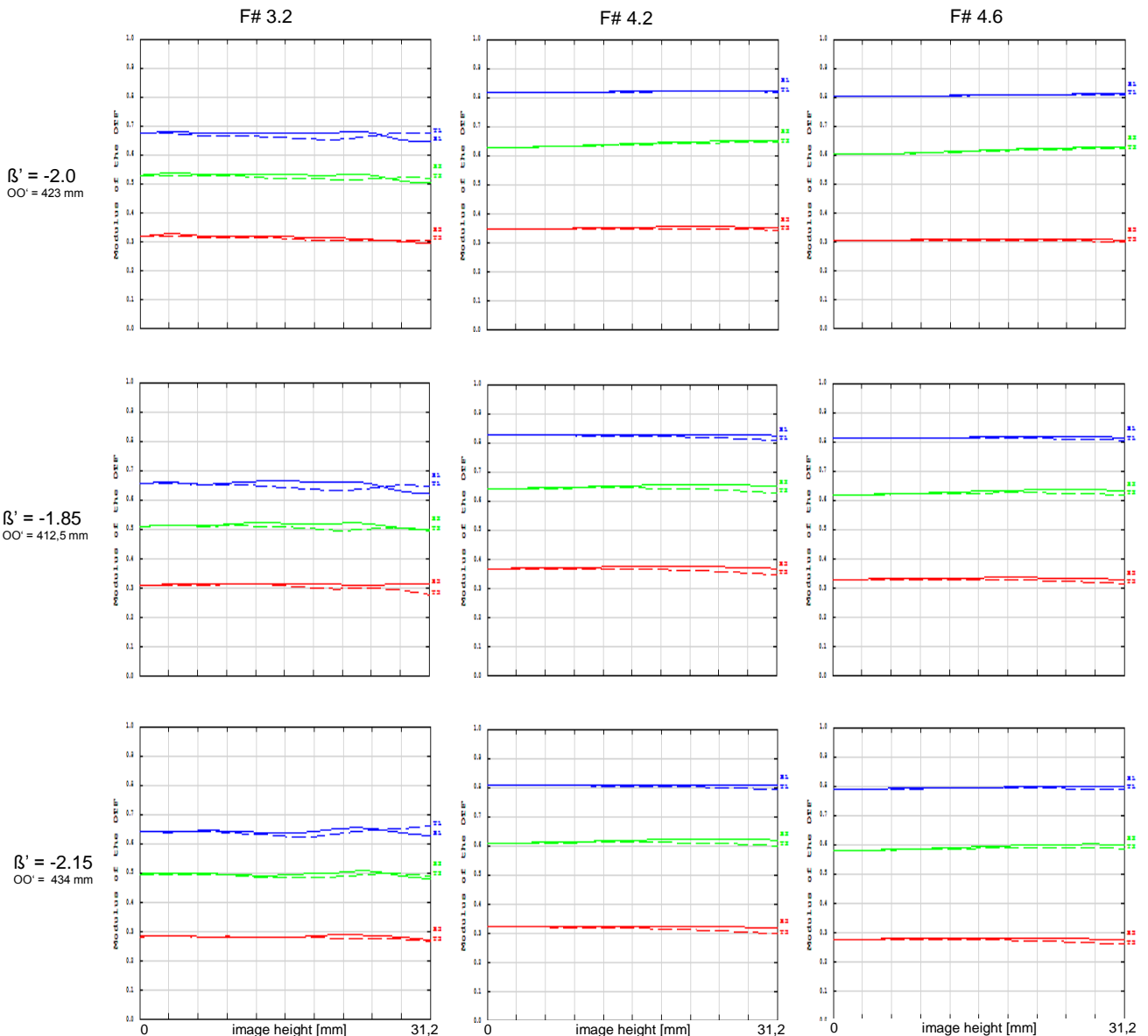
$s'_f = 53,48 \text{ mm}$       $s'_{AP} = -44,60 \text{ mm}$

$HH' = -9,62 \text{ mm}$       $\square d = 81,84 \text{ mm}$

XENON Sapphire 3.2/96 (in retro)  
MTF with reference to image height  
for 12K line sensor with 5  $\mu\text{m}$  pixel

Wavelength $\lambda$	[nm]:	425	475	525	575	625	675	
Spectral weighting	[%]:	1.5	13.6	26.5	27.8	24.2	6.4	
Spatial frequency R	[1/mm]:	25	50	72 (= 12K sensor)				
Image- $\emptyset$	[mm]:	62.5						

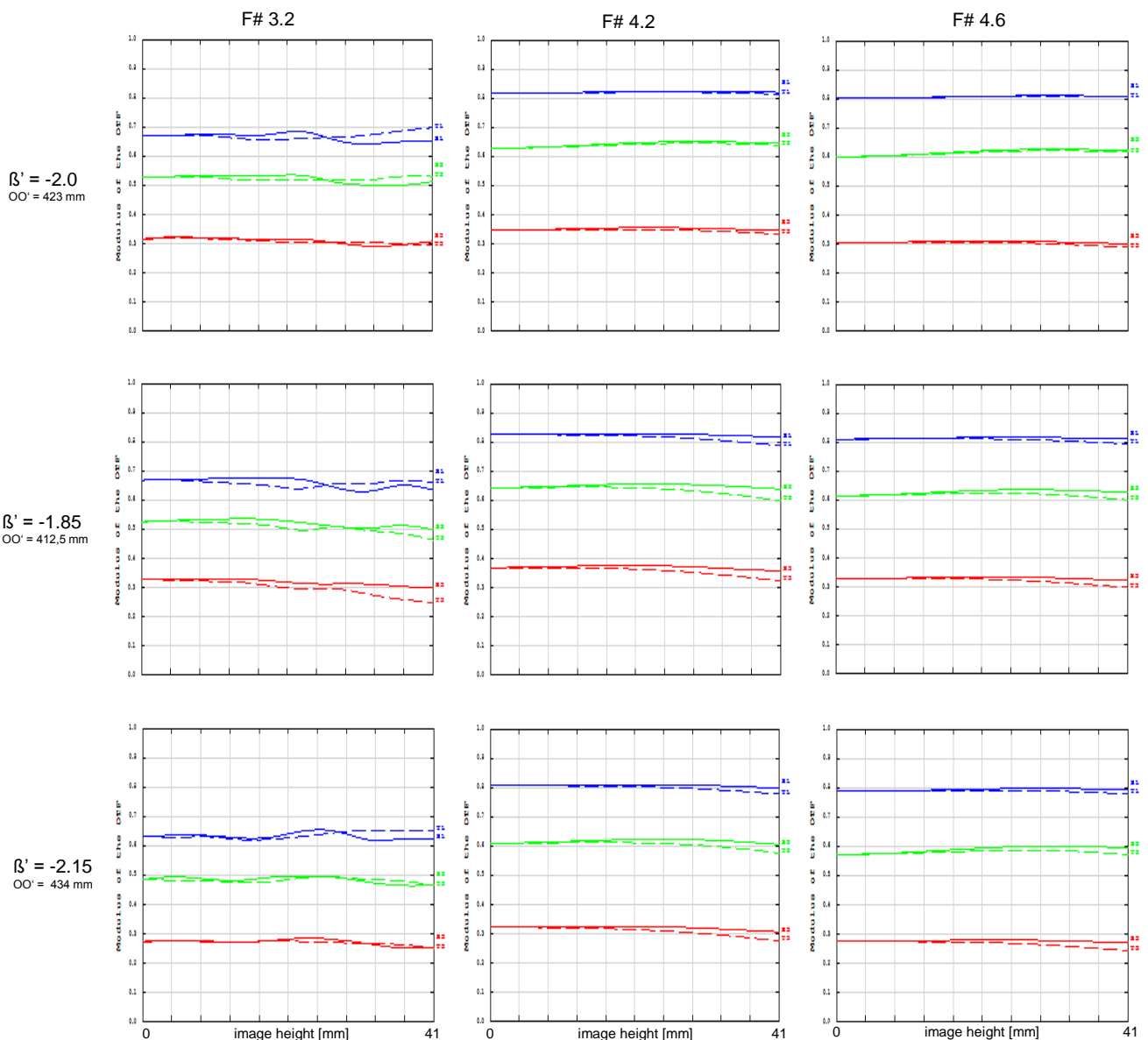
radial     ———  
tangential     - - - -



# XENON-SAPPHIRE 3.2/96 (in retro)

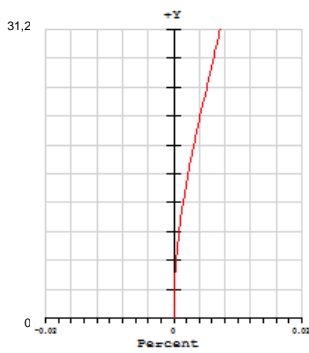
XENON Sapphire 3.2/96 (in retro)  
 MTF with reference to image height  
 for 82 mm 16K line sensor with 5 μm pixel size

Wavelength λ	[nm]:	425	475	525	575	625	675	radial	———
Spectral weighting	[%]:	1.5	13.6	26.5	27.8	24.2	6.4	tangential	- - - - -
Spatial frequency R	[1/mm]:	18	36	72 (= 16K sensor)					
Image-Ø	[mm]:	82							



# XENON-SAPPHIRE 3.2/96 (in retro)

Distortion  
for 12K line sensor

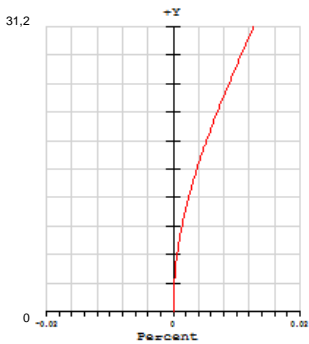
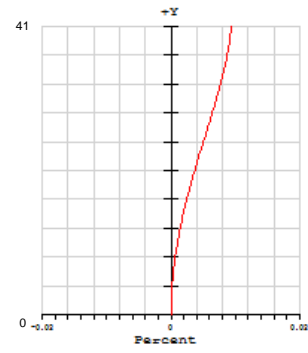


Distortion is shown for different magnifications. Positive values indicate pincushion distortion and negative values barrel distortion.

$$\beta' = -2.0$$

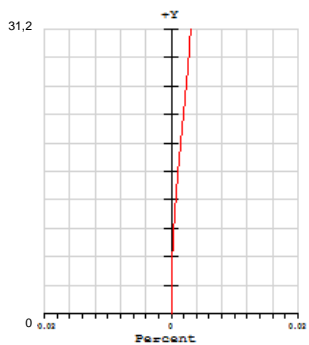
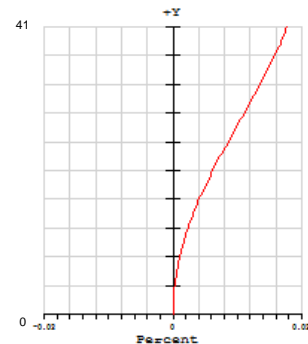
$$OO' = 423 \text{ mm}$$

Distortion  
for 16K line sensor



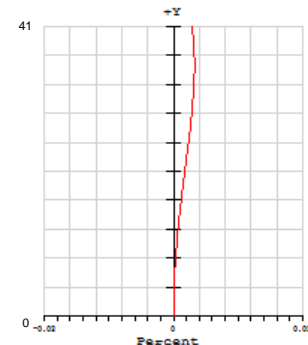
$$\beta' = -1.85$$

$$OO' = 412.5 \text{ mm}$$



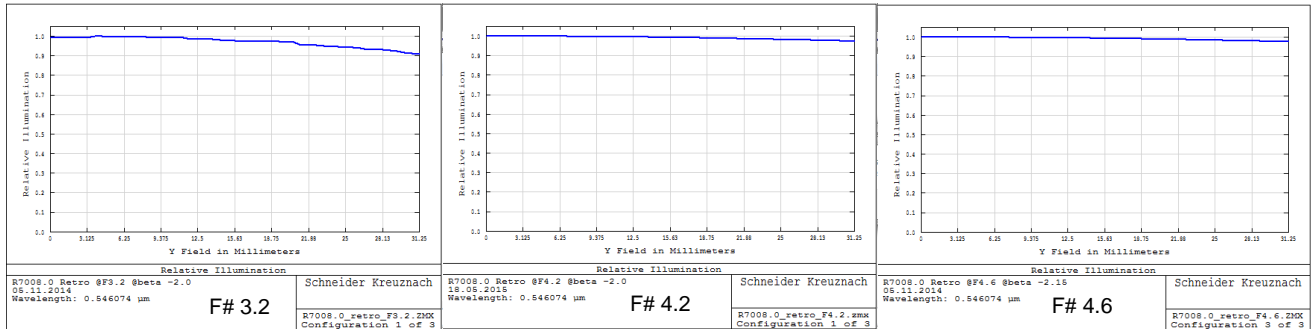
$$\beta' = -2.15$$

$$OO' = 434 \text{ mm}$$

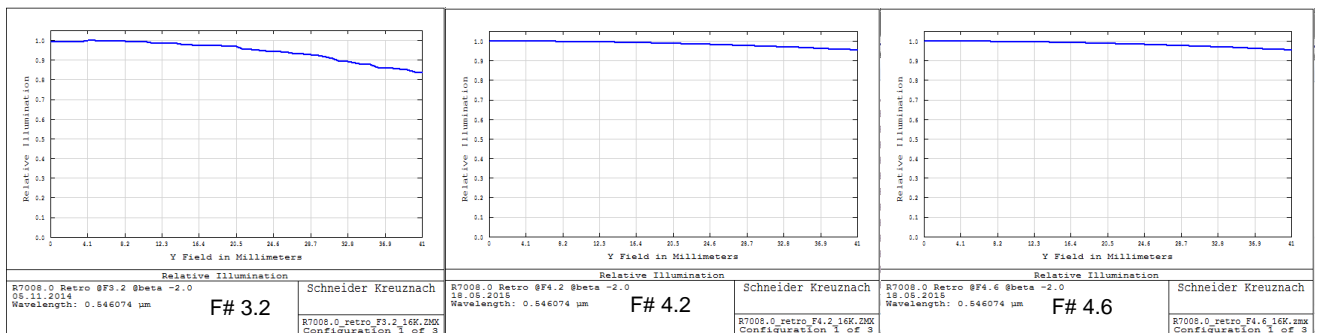


# XENON-SAPPHIRE 3.2/96 (in retro)

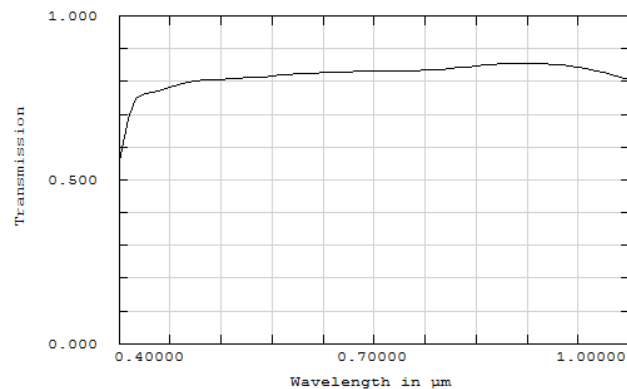
## Relative Illumination for 12K line sensor



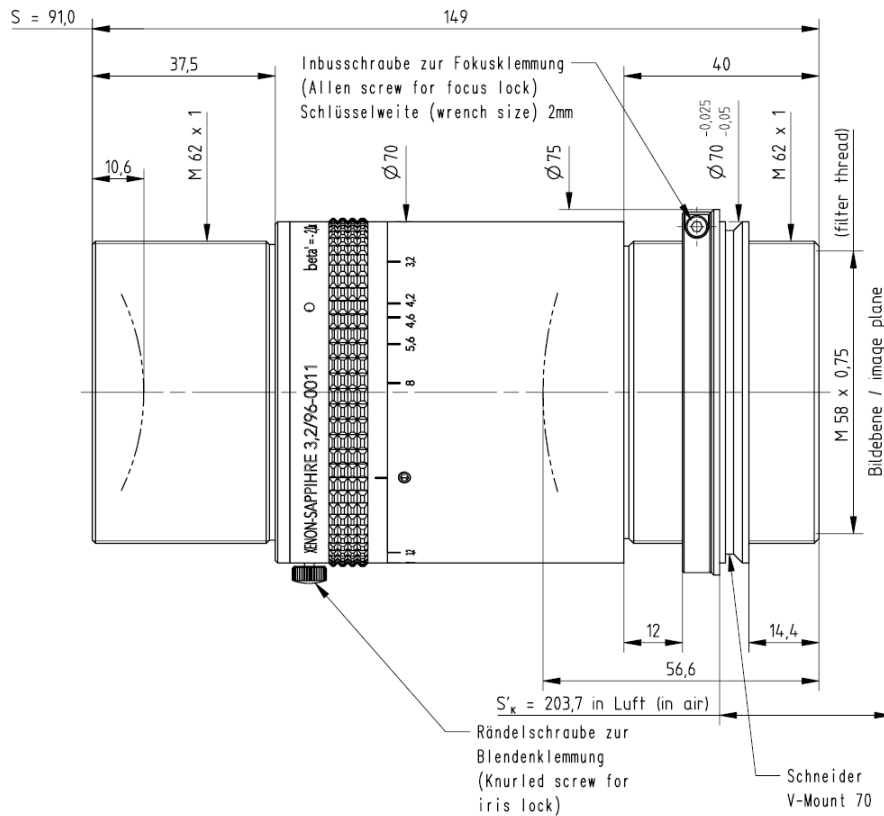
## Relative Illumination for 82 mm 16K line sensor



## Transmission



# XENON-SAPPHIRE 3.2/96 (in retro)



## Contact

Jos. Schneider Optische Werke GmbH  
 Ringstraße 132  
 55543 Bad Kreuznach  
 Germany  
 Phone +49 671 601-205  
 Fax +49 671 601-286  
[www.schneiderkreuznach.com](http://www.schneiderkreuznach.com)  
[industrie@schneiderkreuznach.com](mailto:industrie@schneiderkreuznach.com)

Schneider Optical Technologies Co., Ltd.  
 Rm. A505 Yingdali Science Park, Hongmian Rd.,  
 Futian Free Trade Zone, Shenzhen 518038,  
 P.R. China  
 Phone: +86 755 88 32 11 70  
 Fax: +86 755 88 32 11 75  
[www.schneiderkreuznach.com](http://www.schneiderkreuznach.com)  
[info@schneider-asiapacific.com](mailto:info@schneider-asiapacific.com)

Schneider Optics Inc.  
 285 Oser Ave.  
 Hauppauge, NY 11788  
 USA  
 Phone +1 631 761-5000  
 Fax +1 631 761-5090  
[www.schneideroptics.com/industrial](http://www.schneideroptics.com/industrial)  
[industrial@schneideroptics.com](mailto:industrial@schneideroptics.com)