

## Line Scan Lens

### XENON-SAPPHIRE 2.8/98, beta' = -1.143 (-0.875 in retro)

This high-resolution, high-speed lens is optimized for the use with 12k and 16k line scan sensors. 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 2.8/98, beta' = -1.143x is optimized for 12K sensors with pixel sizes up to 5.2 µm but can also be used with 16K line sensors with pixel sizes of 3.5 µm. The maximum image field diameter is consequently up to 62.5 µm.

- F#2.8 is the maximum opening of the stop and provides maximum brightness. The mechanical vignetting at this F/number is approx. 25%. The MTF for 72 lp/mm is good up to the edge of the field with only moderate sensitivity to magnification change.
- F#3.8 shows excellent MTF over the whole field. The depth of field is bigger and at 3.8 the lens is free of artificial vignetting.
- F#5.6 produces more diffraction which reduces the MTF but it is now quite homogenous over the entire field. The lens is recommended for the complete magnification range of  $-1.20 < \beta' < -1.08$  when used with 12K line sensors.



XENON-SAPPHIRE lens  
beta' = -1.143

### Key Features

- for 12k line scan cameras (62.5mm length / pixel sizes appr. 5µm)
- for 16k line scan cameras (57.3mm length / pixel sizes 3.5µm)
- 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 2.8/98-0011
F# range	2.8 – 8
Focal length	97.5 mm
Image circle	62.5 mm
Beta'	-1.143 (-1.08 ... -1.20 )
Object to image distance	379 (378 ... 380) mm
Transmission	400 -1000 nm
Interface	Schneider V-mount 70
Weight	750 gr.
Code no.	1076453

### 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

## XENON-SAPPHIRE 2.8/98-0011



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

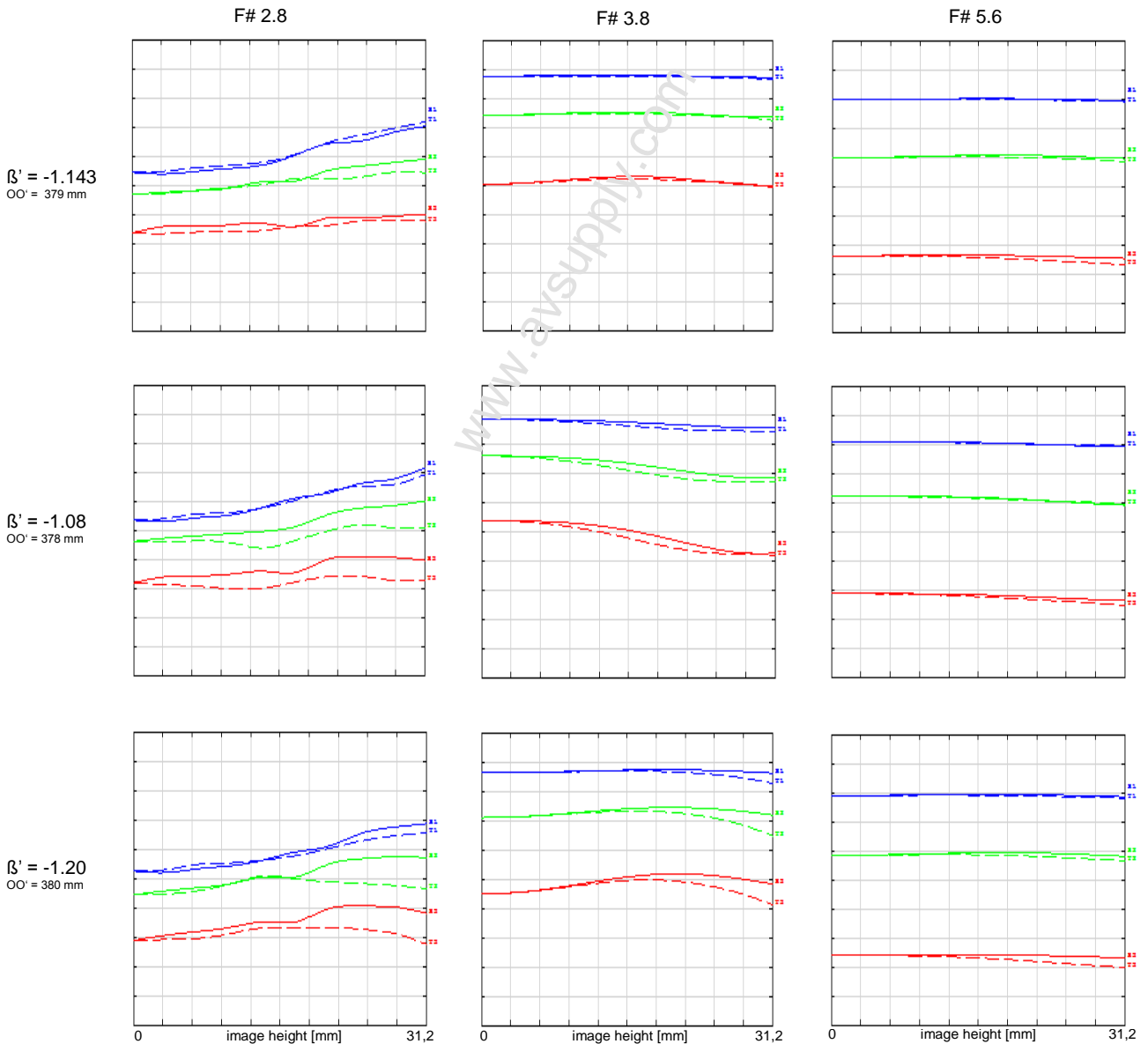
### XENON SAPPHIRE 2.8/98

f = 97.5 mm       $\beta'_p = 0.96$   
 $s_f = -52.5$  mm       $s_{EP} = 48.6$  mm  
 $s'_F = 49.5$  mm       $s'_{AP} = -44.5$  mm  
 HH' = -12.9 mm       $\square d = 80.1$  mm

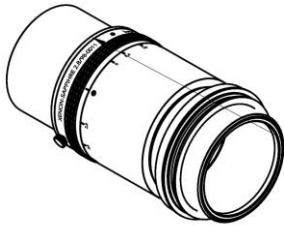
### XENON Sapphire 2.8/98 MTF with reference to image height for 12K line sensor with appr. 5 $\mu$ m pixel

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]:	18	36	72 (= 12K sensor)				
Image- $\emptyset$	[mm]:	62.5						

radial      ———  
 tangential      - - - - -



## XENON-SAPPHIRE 2.8/98-0011



Roter Punkt:  
 Kennzeichnung vermittelter Azimut  
 90° versetzt zur Zeilenrichtung.  
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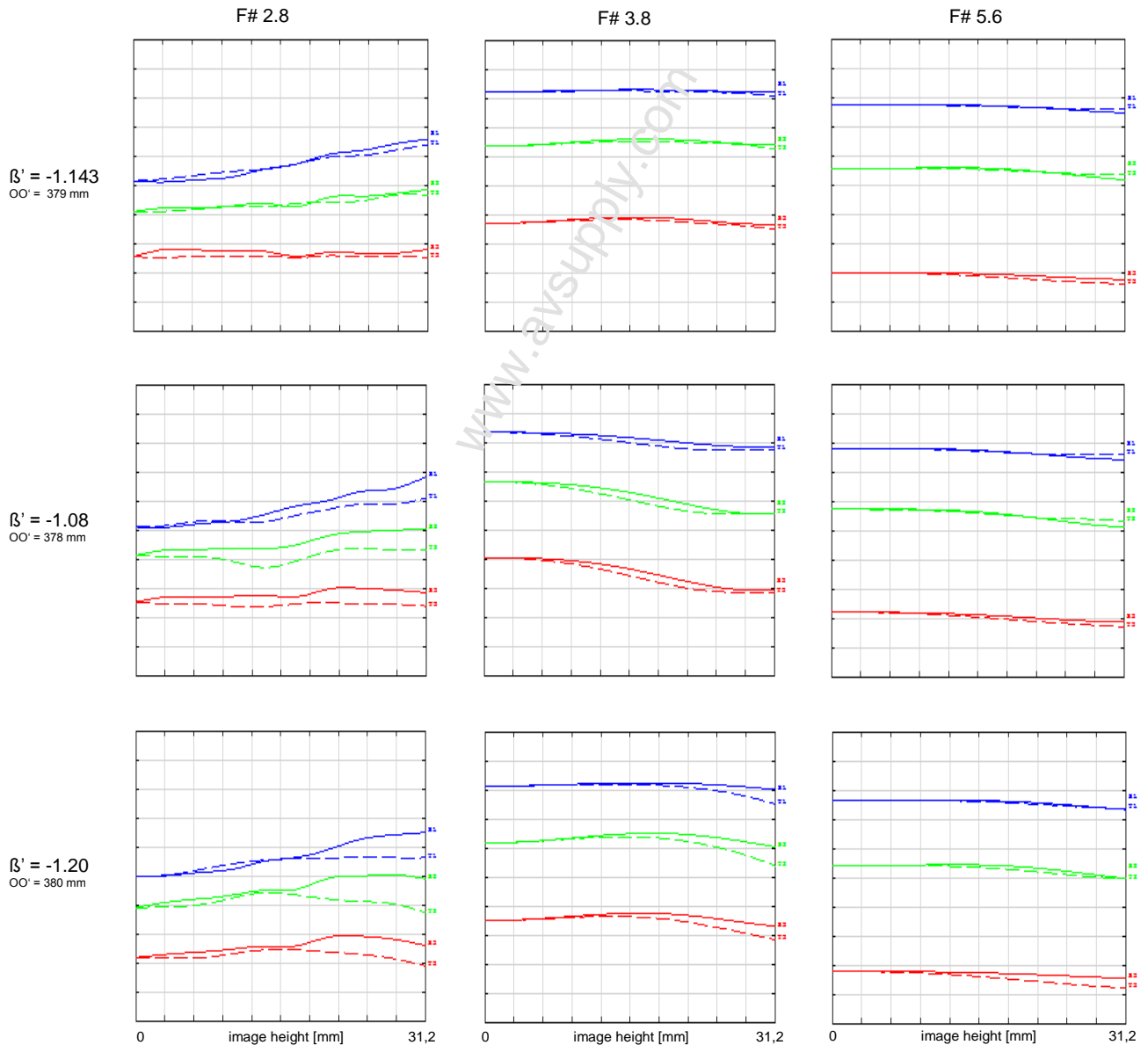
### XENON SAPPHIRE 2.8/98

$f' = 97.5 \text{ mm}$        $\beta'_p = 0.96$   
 $s_F = -52.5 \text{ mm}$        $s_{EP} = 48.6 \text{ mm}$   
 $s'_F = 49.5 \text{ mm}$        $s'_{AP} = -44.5 \text{ mm}$   
 $HH' = -12.9 \text{ mm}$        $\square d = 80.1 \text{ mm}$

### XENON Sapphire 2.8/98 MTF with reference to image height for 16K line sensor with 3.5 $\mu\text{m}$ pixel

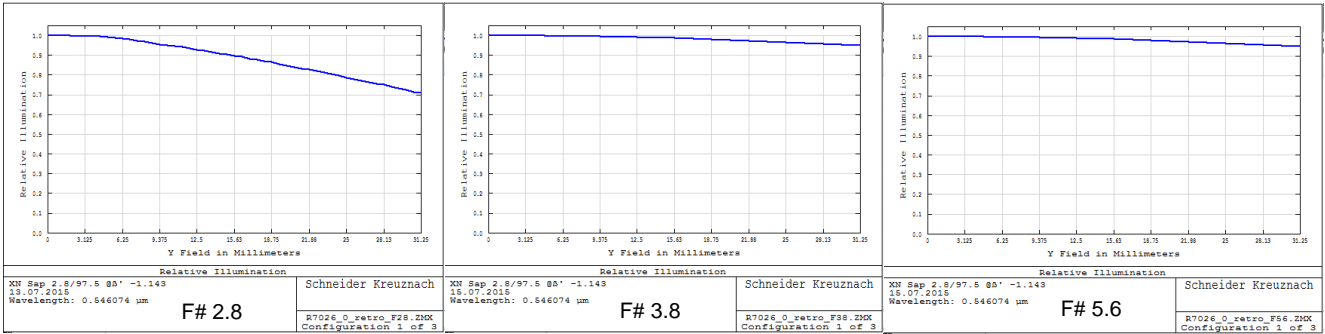
Wavelength $\lambda$	[nm]:	425	475	525	575	625	675	
Spectral weighting	[%]:	1.5	13.6	26.5	27.8	24.2	6.4	
Spatial frequency R	[1/mm]:	25	50	100 (= 16K sensor)				
Image- $\emptyset$	[mm]:	62.5						

radial ———  
 tangential - - - -

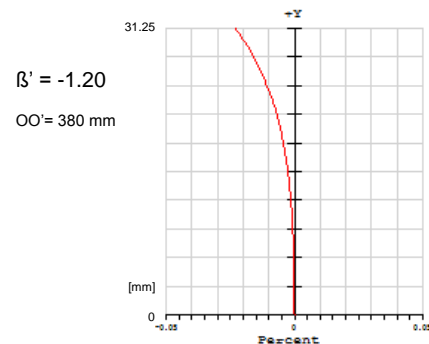
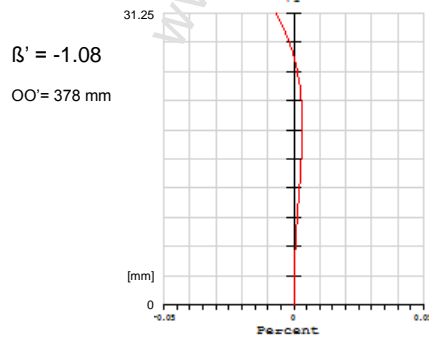
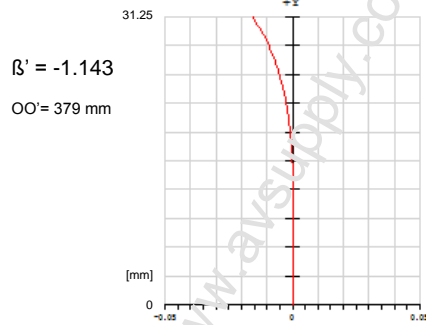


## XENON-SAPPHIRE 2.8/98-0011

### Relative Illumination for 62.5 mm line sensor



### Distortion



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

