

# Line Scan Lens

## XENON-DIAMOND 2.9/106, beta' = -2.6x for use with Beam Splitter Prism (BSP)

This lens is optimized for the use with 12k pixel line scan sensors but can also be used for 16k. It is broadband coated for the spectral range of 400 – 1000 nm. The V-mount makes it easy to install and rotate the lens into the desired azimuth position for a wide range of line scan applications.

- Extremely high resolution of 2 µm in object space
- Highest light throughput with maximum opening at F# 2.9
- High and homogeneous MTF @72 lp/mm over entire 12k field
- Distortion smaller than 0.05%



XENON-Diamond  
shown with mounted BSP

### Key Features

- for line scan cameras
  - 12K (62.5 mm length / pixel sizes appr. 5 µm)
  - 16K (82 mm length / pixel sizes appr. 5 µm)
- Very high optical image quality in the large sensor range
- Vibration-insensitive for stable optical performance
- Lockable distance and aperture settings
- Industry-compatible V-mount interface
- Reliability and constant quality due to 100% quality control

### Applications

- Web and surface inspections
- Quality control
- FPD inspection
- PCB inspection
- OLED inspection
- Line scan applications

### Technical Specifications XENON-DIAMOND 2.9/106 for BSP

F# range	2.9 – 8
Focal length	105.3 mm
Image circle	62.5 / 82 mm
Beta'	-2.6 (-2.45 ... -2.75)
Object to image distance	538 (524 ... 552) mm
Transmission	400 - 1000 nm
Interface	Schneider V-mount 70
Weight	appr. 1000 gr.
Filter thread	M40.5 x 0.5
Code no. of lens itself	1075092
Code no. of combination lens + mounted BSP	1076949

### Accessories

	Code no.
Beam Splitter in mount	# 1073831
Adapter V70 / M72 x 0.75	10 mm # 1072419
Extension tube M72	5 mm # 1072420
Extension tube M72	10 mm # 1072421
Extension tube M72	25 mm # 26406
Extension tube M72	50 mm # 1054733
Extension tube M72	100 mm # 1079483
Extension tube M72	200 mm # 1079484
For 82 mm sensor length (16K):	
Adapter M72 x 0.75 / M95 x 1	4 mm # 1077013
Extension tube M95	10 mm # 1077290
Extension tube M95	25 mm # 1062892
Extension tube M95	50 mm # 1062893
Extension tube M95	100 mm # 1062894
Extension tube M 95	200 mm # 1077291

See photo  
upper right corner



Please note that this lens works only properly with a 25 mm (BK7) Beam Splitter Prism at the object side.

If a pellicle is used instead of a BSP a different lens (designed without 25 mm BK7) has to be used.

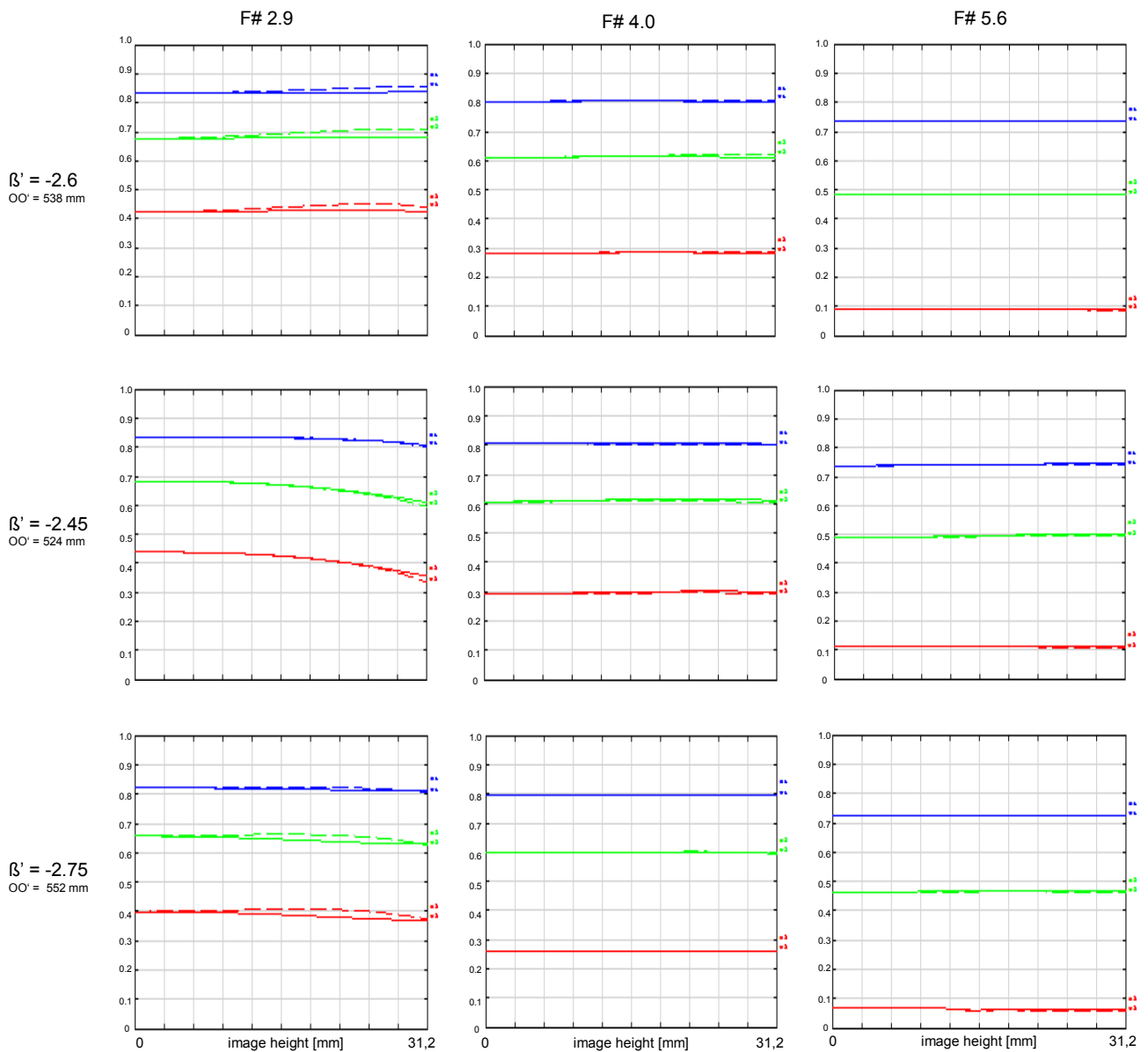
# Xenon-Diamond 2.9/106 for BSP

## XENON DIAMOND 2.9/106 for BSP

$f' = 105.3 \text{ mm}$        $\beta'_P = 0.97$   
 $s_F = -57.7 \text{ mm}$        $s_{EP} = 44.2 \text{ mm}$   
 $s'_F = 58.9 \text{ mm}$        $s'_{AP} = -49.9 \text{ mm}$   
 $HH' = 13.1 \text{ mm}$        $\Sigma d = 107.1 \text{ mm}$

### XENON Diamond 2.9/106 MTF with reference to image height for a 12K (5 $\mu\text{m}$ pixel) sensor

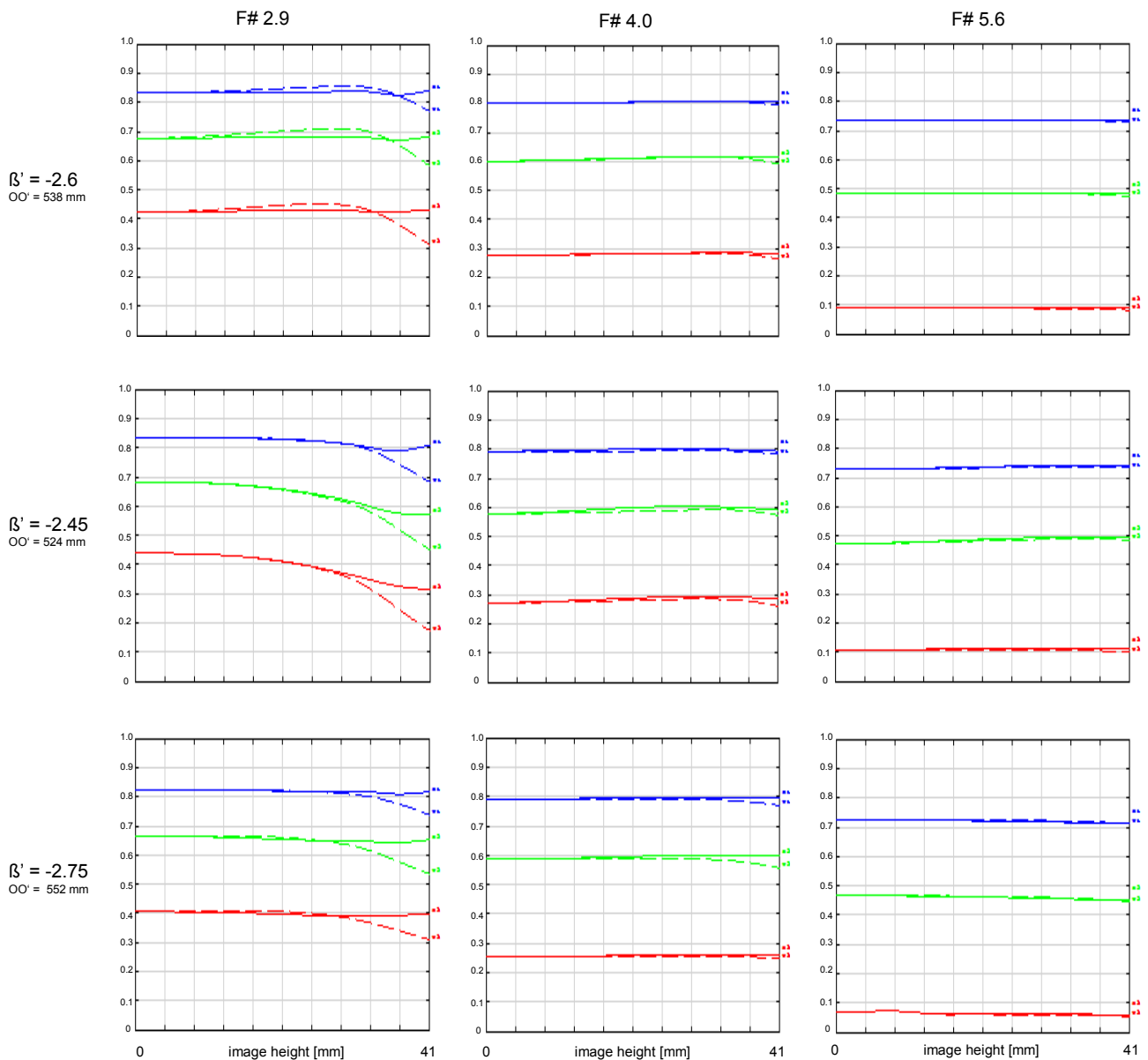
Wavelength $\lambda$	[nm]:	425	475	525	575	625	675	radial	———
Spectral weighting	[%]:	1.5	13.6	26.5	27.8	24.2	6.4	tangential	- - - - -
Spatial frequency R	[1/mm]:	18	36	72					
Image- $\emptyset$	[mm]:	62.5							



# Xenon-Diamond 2.9/106 for BSP

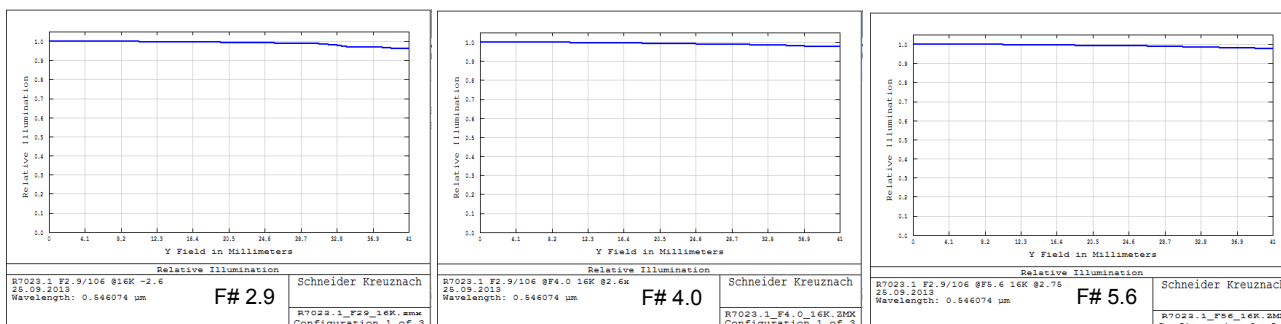
XENON Diamond 2.9/106  
MTF with reference to image height for a **16K (5µm pixel) sensor**

Wavelength $\lambda$	[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					
Image-Ø	[mm]:	82							

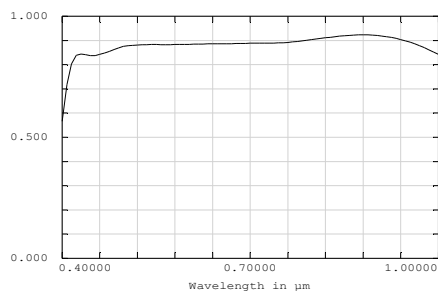


# Xenon-Diamond 2.9/106 for BSP

## Relative Illumination for sensor length up to 82 mm

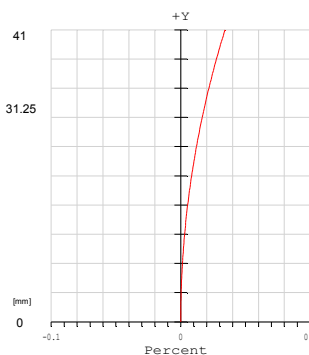


## Transmission



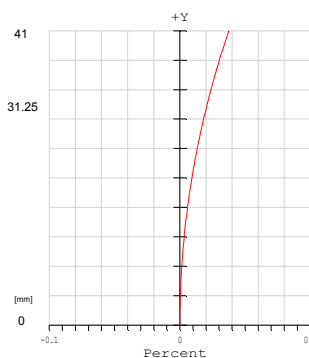
## Distortion for sensor length 82 mm

$\beta' = -2.6$   
OO' = 538 mm

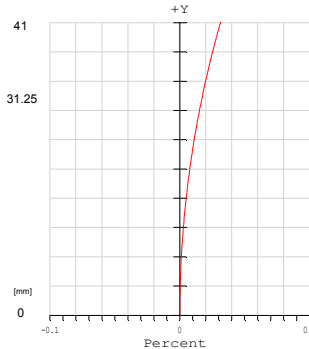


Distortion is shown for different magnifications. Positive values indicate pincushion distortion and negative values barrel distortion.

$\beta' = -2.45$   
OO' = 524 mm



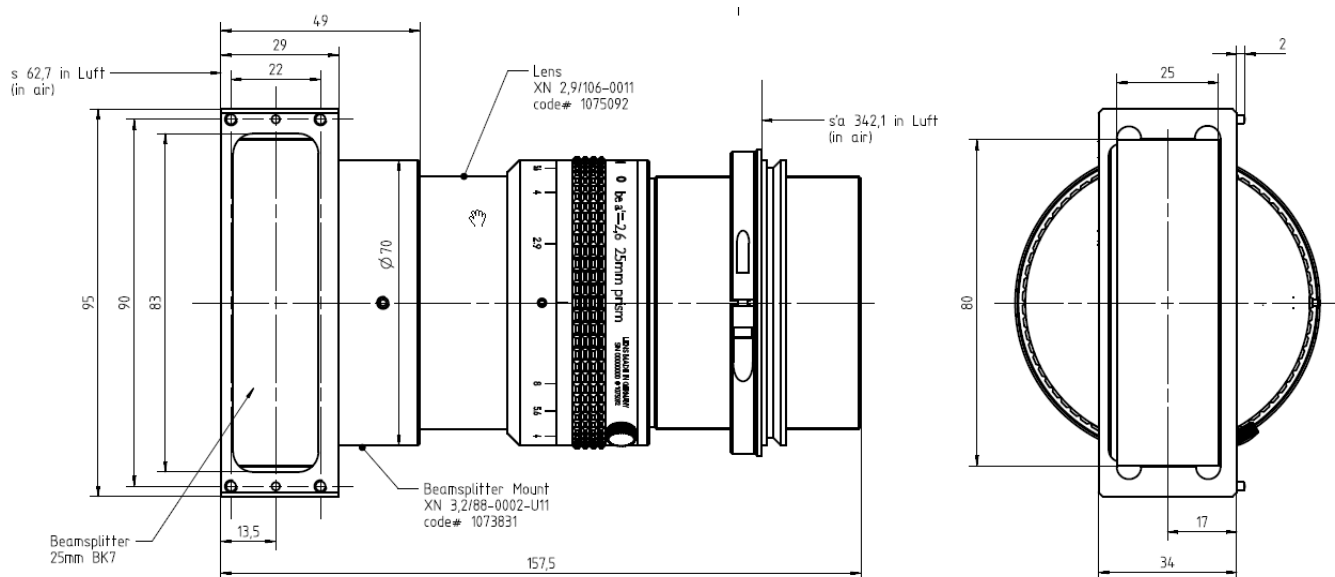
$\beta' = -2.75$   
OO' = 552 mm



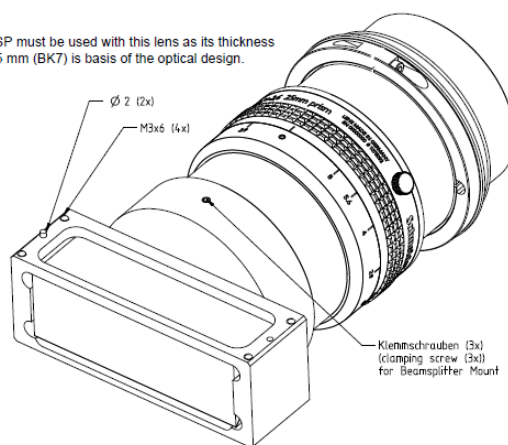


# Xenon-Diamond 2.9/106 with mounted BSP

Lens XENON-DIAMOND 2.9/106 for use with BSP  
-> with mounted beam splitter prism  
code no. 1076949



A BSP must be used with this lens as its thickness of 25 mm (BK7) is basis of the optical design.



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