

Line Scan Lens

XENON-SAPPHIRE 3.5/96, beta' = -0.35

This high-resolution, high-speed lens is optimized for the use with 16k pixel 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 3.5/96 provides three significant stop positions that are especially marked on the stop ring:

- F#3.5 is the maximum opening of the stop and provides maximum brightness. The mechanical vignetting at this F/number is approx. 15% at the edge of the field. The MTF for 100 lp/mm is very high up to the edge of a 58 mm field. Due to the high aperture the lens is more sensitive with respect to change of magnification.
- F#4.4 shows maximum MTF and practically diffraction limited performance over the whole field. The depth of field is bigger but the lens is still sensitive to magnification changes. At F#4.4 the lens is free of artificial vignetting.
- F#5.2 produces more diffraction which reduces the MTF slightly but is now extremely homogenous over the entire field. The lens shows this performance for the complete magnification range from $-0.37 < \beta' < -0.325$ and performs well for a magnification range of $-0.39 < \beta' < -0.30$ at a 16k performance of 100 lp/mm.



XENON-SAPPHIRE lens

Key Features

- for 16k line scan cameras (57.3mm length / pixel sizes 3.5µm)
- for 12k line scan cameras (62mm length / pixel sizes appr. 5µm)
- High resolution optics 400 - 1000 nm
- Robust mechanics for industrial environment
- Vibration insensitive
- Focus and iris setting lockable

Applications

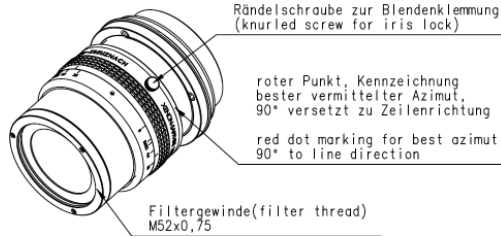
- High-resolution 16k line scan applications
- 12k TDI inspection
- Machine Vision and other imaging applications with high throughput
- Flat panel inspection
- Quality control

| Technical Specifications | XENON-SAPPHIRE 3,5/96-0001 |
|--------------------------|----------------------------|
| F# range | 3.5 - 8 |
| Focal length | 95.5 mm |
| Image circle | 62.5 mm |
| Beta' | -0.35 (-0.30 ... -0.39) |
| Object to image distance | 488 (529 ... 464) mm |
| Transmission | 400 -1000 nm |
| Interface | Schneider V-mount 70 |
| Weight | 755 gr. |
| Code no. | 1068012 |

Accessories

| | | |
|--------------------------|-------|-----------------------|
| Adapter V70 / M72 x 0.75 | 10 mm | Code no. # 1072419 |
| Extension tube 5 mm | | # 1072420 |
| Extension tube 10 mm | | # 1072421 |
| Extension tube 25 mm | | # 26406 |
| Extension tube 50 mm | | # 1054733 |

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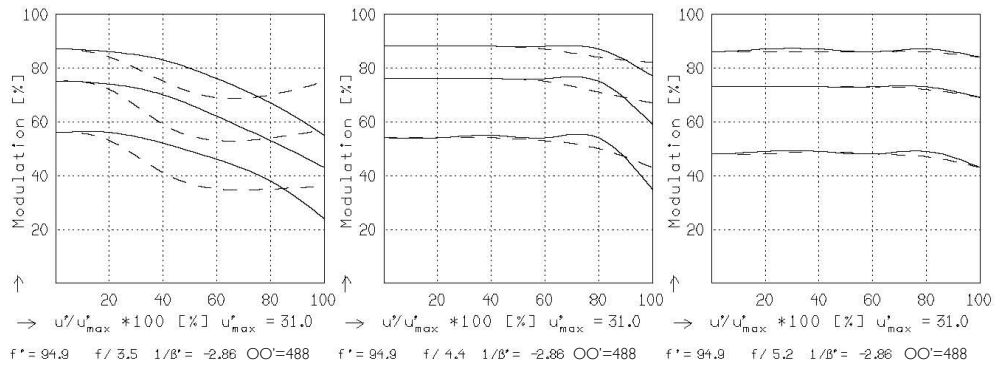
| | | | |
|----------|-----------|--------------|-----------|
| $f' =$ | 95.5 mm | $\beta'_P =$ | 1.01 |
| $s_F =$ | -49.85 mm | $s_{EP} =$ | 44.43 mm |
| $s'_F =$ | 52.31 mm | $s'_{AP} =$ | -44.43 mm |
| $HH' =$ | -9.10 mm | $\Sigma d =$ | 79.74 mm |

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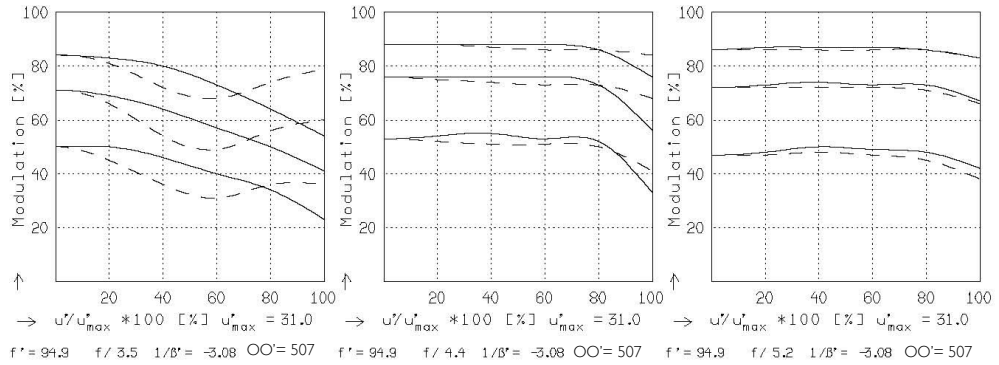
MODULATION with reference to the relative image height

| | | | | | | | |
|----------------------------|----------|------|-----|------|------|------|-----|
| Wavelength λ | [nm] : | 525 | 675 | 625 | 575 | 475 | 425 |
| Spectral weighting | [%] : | 26.5 | 6.4 | 24.2 | 27.8 | 13.6 | 1.5 |
| Spatial frequency R | [1/mm] : | 25 | 50 | 100 | | | |
| Image- \emptyset f / 3.5 | [mm] : | 62.0 | | | | | |
| Image- \emptyset f / 5.2 | [mm] : | 62.0 | | | | | |

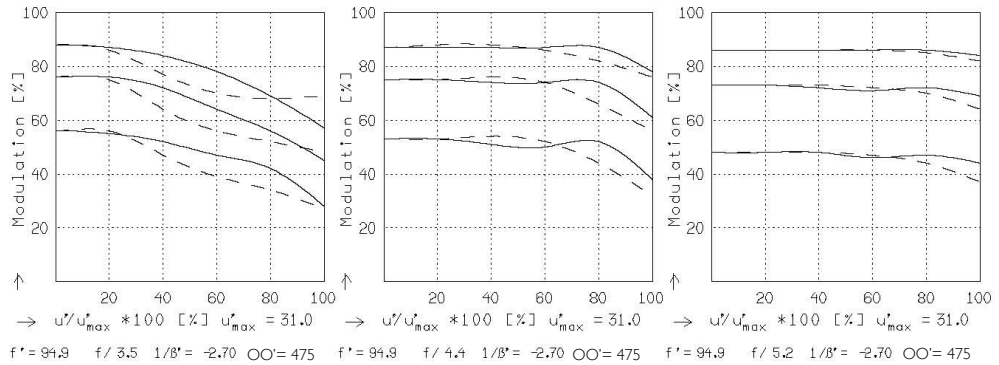
$\beta' = -0.35$



$\beta' = -0.325$

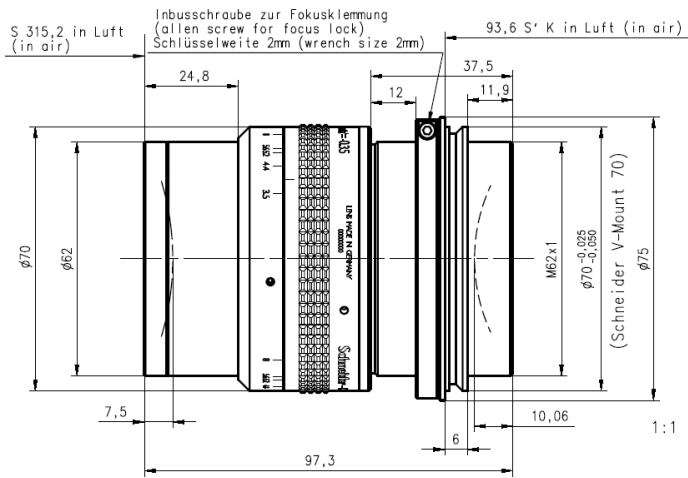


$\beta' = -0.37$



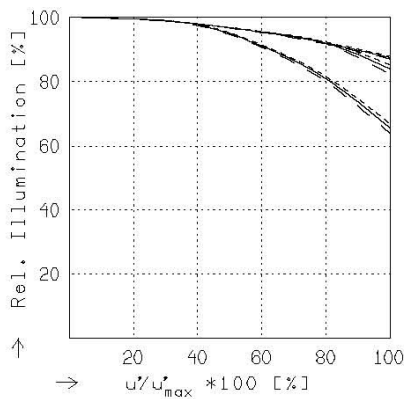
Focusing : MTF_{max} at f / 4.5 , R = 50 1/mm, $u'/u'_{max} = 0$

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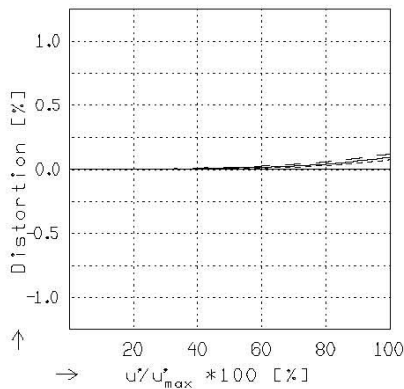
| | |
|---------------------------|-------------------------------|
| $f = 95.5 \text{ mm}$ | $\beta'_P = 1.01$ |
| $s_F = -49.85 \text{ mm}$ | $s_{EP} = 44.43 \text{ mm}$ |
| $s'_F = 52.31 \text{ mm}$ | $s'_{AP} = -44.43 \text{ mm}$ |
| $HH' = -9.10 \text{ mm}$ | $\Sigma d = 79.74 \text{ mm}$ |



RELATIVE ILLUMINATION

The relative illumination is shown for the given focal distances or magnifications.

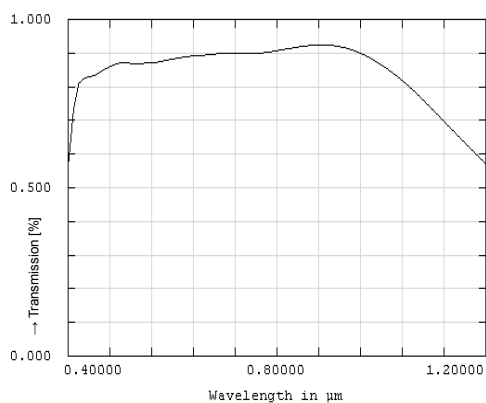
| | $f / 3.5$ | $f / 4.4$ | $f / 5.2$ |
|------------------------|-------------------|-------------|-----------|
| — $\beta' = -0.3500$ | $u'_{max} = 31.0$ | $OO' = 488$ | |
| - - $\beta' = -0.3250$ | $u'_{max} = 31.0$ | $OO' = 507$ | |
| ... $\beta' = -0.3700$ | $u'_{max} = 31.0$ | $OO' = 475$ | |



DISTORTION

Distortion is shown for the given focal distances or magnifications. Positive values indicate pincushion distortion and negative values barrel distortion.

| | | |
|------------------------|-------------------|-------------|
| — $\beta' = -0.3500$ | $u'_{max} = 31.0$ | $OO' = 488$ |
| - - $\beta' = -0.3250$ | $u'_{max} = 31.0$ | $OO' = 507$ |
| ... $\beta' = -0.3700$ | $u'_{max} = 31.0$ | $OO' = 475$ |



TRANSMITTANCE

Relative spectral transmittance is shown with reference to wavelength.

Contact

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