

# Line scan lens

## Apo-Componon 4.5/90-0018

Wherever complex web and surface inspections are concerned, the line scan image capture method is used in most cases. Due to the principle used, this method requires a very careful choice of camera and an optimally adapted lens in order to achieve maximum system performance. It is essential to observe important application-specific and physical parameters: the size of the CCD or CMOS imaging sensor in the camera defines the minimum required image circle of the lens.



Apo-Componon 4.5/90

### Key Features

- Very high optical image quality in the large sensor range
- Vibration-insensitive for stable optical performance
- Reverse position of the lens possible to enlarge the magnification range
- Lockable distance and aperture settings
- Use in best azimuth position possible
- Industry-compatible V-mount interface
- 100% quality control guarantees reliability and constant quality
- Low maintenance requirements, therefore high system availability

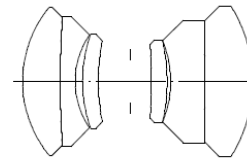
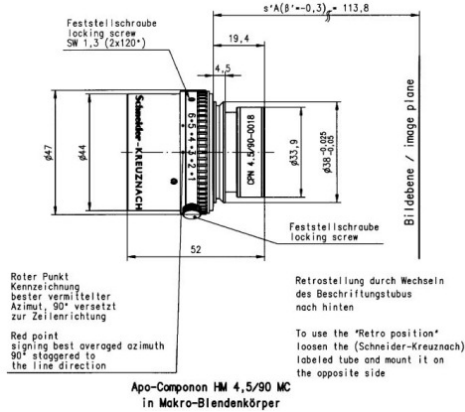
### Applications

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

### Technical Specifications

F-number	4.5
Focal length	90.8 mm
Image circle	86 mm
Magnification	-0,30
Transmission	400 - 1000 nm
Interface	V-Mount
Weight	140 gr.
Option	Optical filter

# Apo-Componon 4.5/90



**R 4839.1 APO-CPN 4.5/90**

$f' = 90.8 \text{ mm}$      $\beta_p = 1.011$

$s_F = -66.7 \text{ mm}$      $s_{EP} = 23.1 \text{ mm}$

$s_F^* = 67.9 \text{ mm}$      $s_{AP} = -23.9 \text{ mm}$

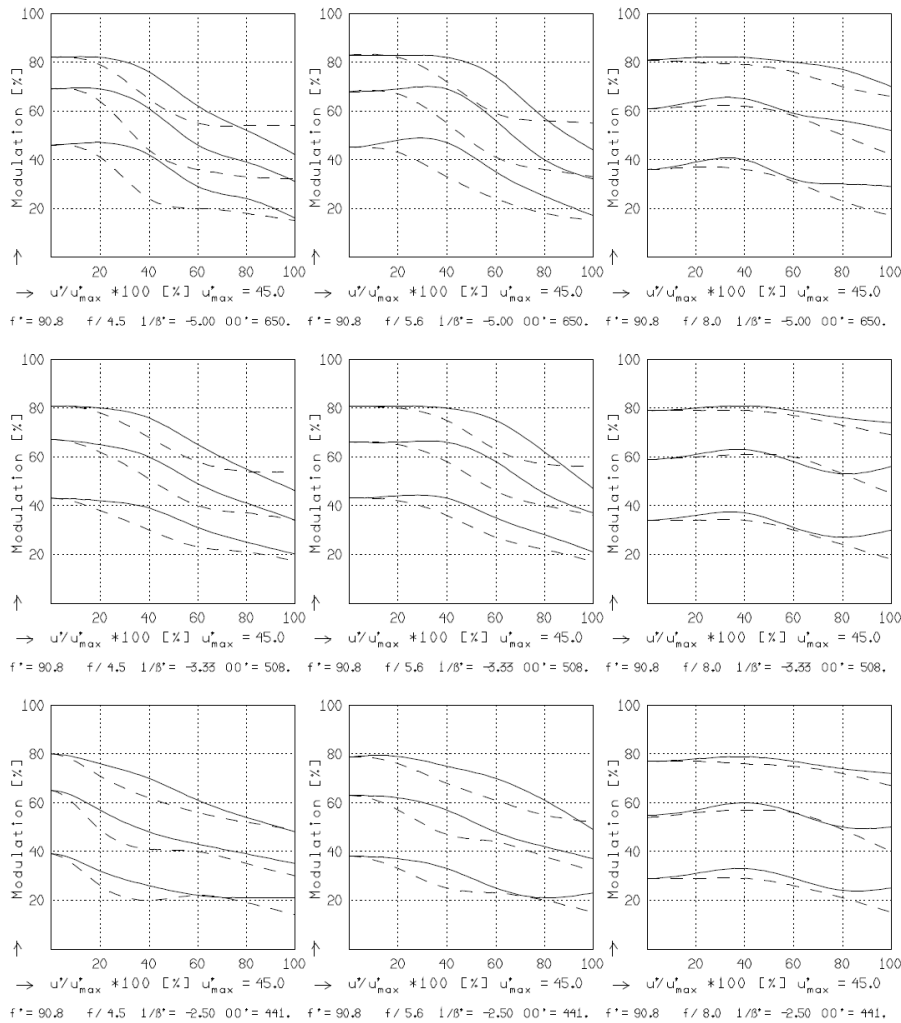
$HH' = -3.6 \text{ mm}$      $\Sigma d = 43.5 \text{ mm}$

## R 4839.1 APO-CPN 4.5/90

MODULATION with reference to the relative image height

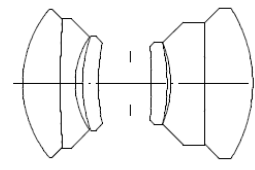
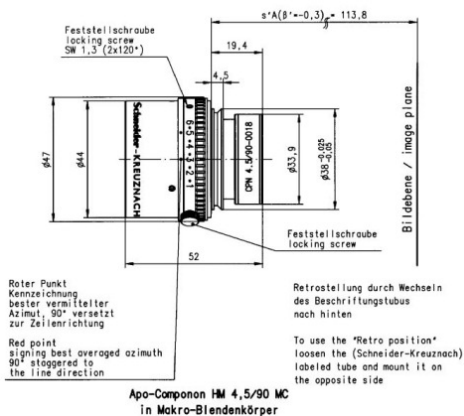
Wavelength $\lambda$ [nm]	555	655	605	505	455	405
Spectral weighting [%]	19.6	23.7	22.2	15.7	12.1	6.7
Spatial frequency R [1/mm]	20	40	80			
Format [mm X mm]	90.0	X	0.0			
Diagonal $2u'$ [mm]	90.0					

radial —  
tangential - -



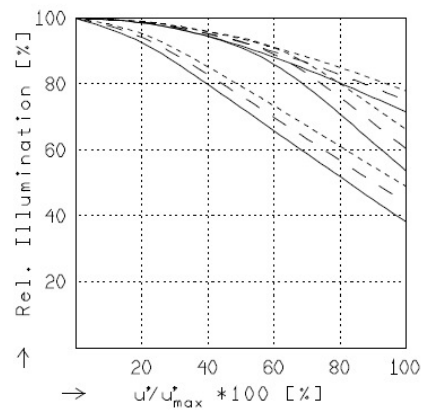
Focusing : MTF<sub>max</sub> at  $f / 4.5$  , R = 80 1/mm,  $u'/u'_{max} = 0$

# Apo-Componon 4.5/90



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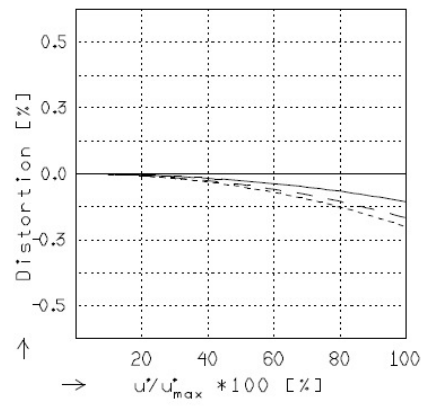
$f' = 90.8 \text{ mm}$	$\beta_p = 1.011$
$s_F = -66.7 \text{ mm}$	$s_{EP} = 23.1 \text{ mm}$
$s_F^* = 67.9 \text{ mm}$	$s_{AP}^* = -23.9 \text{ mm}$
$HH' = -3.6 \text{ mm}$	$\Sigma d = 43.5 \text{ mm}$



## RELATIVE ILLUMINATION

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

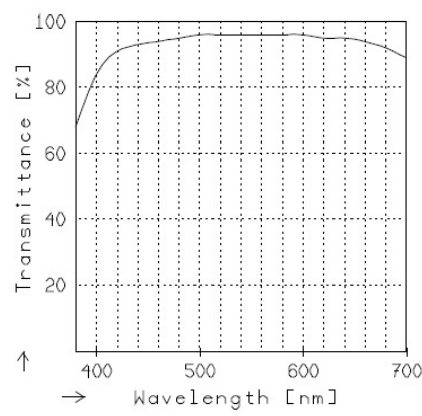
	$f / 4.5$	$f / 5.6$	$f / 8.0$
— $\beta' = -0.2000$	$u'_{max} = 45.0$	$00' = 650.$	
- - $\beta' = -0.3000$	$u'_{max} = 44.9$	$00' = 508.$	
- - - $\beta' = -0.4000$	$u'_{max} = 44.9$	$00' = 441.$	



## DISTORTION

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

— $\beta' = -0.2000$	$u'_{max} = 44.9$	$00' = 650.$
- - $\beta' = -0.3000$	$u'_{max} = 44.9$	$00' = 508.$
- - - $\beta' = -0.4000$	$u'_{max} = 44.9$	$00' = 441.$



## TRANSMITTANCE

Relative spectral transmittance is shown with reference to wavelength.