

# Macro-Varon 4.5/85 with beam splitter

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This lens is designed to be used in line scan applications where coaxial illumination is required. The 60 mm beam splitter cube offers the opportunity to create an in-line illumination for high reflective objects. Coaxial illumination is ideal for demanding circuit boards and other high resolution applications where a bright, diffuse uniform illumination is needed.

This lens offers a high optical performance at a 3.5x magnification over the entire field. The lens design considers the optical glass path of the high quality beam splitter to achieve a top performance. Lens and beam splitter assembly are precisely aligned to each other, so that a maximum of light is captured and directed to the image plane of 12k cameras with 5µm pixel size, with almost no loss at the image edges.



Macro-Varon with beam splitter

### Key Features

- 3.5x Magnification
- Lens and Beam splitter Cube
- Optimized for 12K Cameras with 5µm Pixel sizes
- Separate azimuth alignment of Beam splitter and Lens

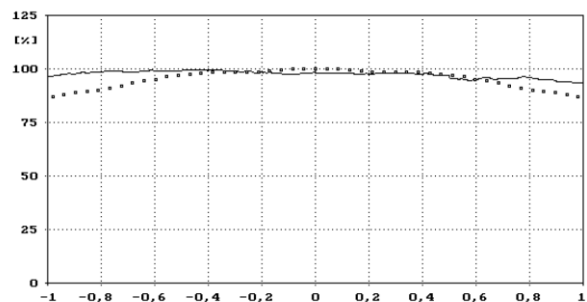
### Applications

- PCB / FPD Inspection
- LED inspection
- Flat Glass Inspection
- Wafer Inspection
- Line Scan Applications

### Technical Specifications

F-number	4.5
Focal length	85.2 mm
Image circle	62 mm
Recommended Magnification	3.5x
Interface	V38-Mount
Weight	410 gr.
Field of View	17.7 mm
Working distance	62.1 mm
Numerical Aperture	0.087
Illumination drop off	Max. 8 %
Beam splitter size	60 x 25 x 25 mm
Code No.	1069837

Figure 1: relative illumination with beam splitter



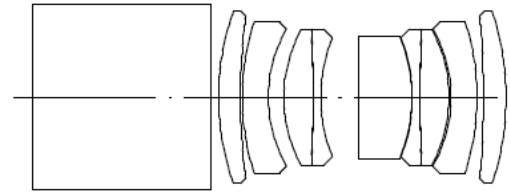
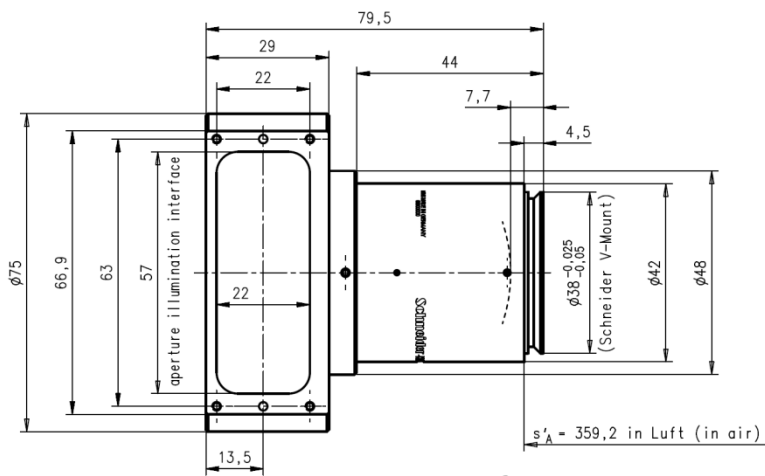
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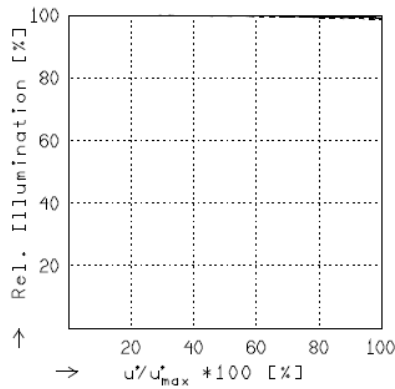
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## MRV 4.5/85

$f'$	= 85.2 mm	$\beta'_p$	= 1.037
$s_F$	= -42.9 mm	$s_{EP}$	= 39.3 mm
$s_{F'}$	= 64.1 mm	$s_{AP}$	= -24.2 mm
$HH'$	= 2.9 mm	$\Sigma d$	= 66.3 mm

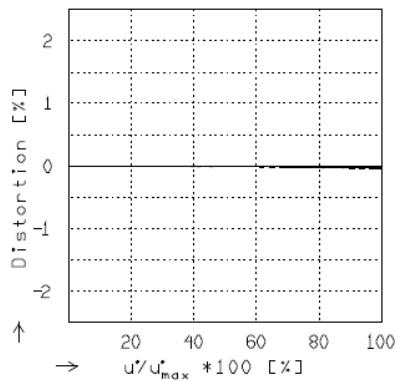


## RELATIVE ILLUMINATION

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

$f / 4.5$

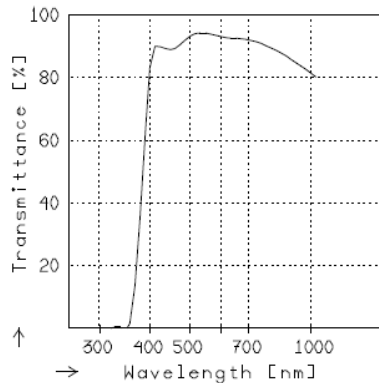
—	$\beta' = -4.0000$	$u'_{max} = 31.0$	$00' = 535.$
- -	$\beta' = -3.5000$	$u'_{max} = 31.0$	$00' = 496.$
- - -	$\beta' = -3.0000$	$u'_{max} = 31.0$	$00' = 457.$



## DISTORTION

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

—	$\beta' = -4.0000$	$u'_{max} = 31.0$	$00' = 535.$
- -	$\beta' = -3.5000$	$u'_{max} = 31.0$	$00' = 496.$
- - -	$\beta' = -3.0000$	$u'_{max} = 31.0$	$00' = 457.$



## TRANSMITTANCE

Relative spectral transmittance is shown with reference to wavelength.

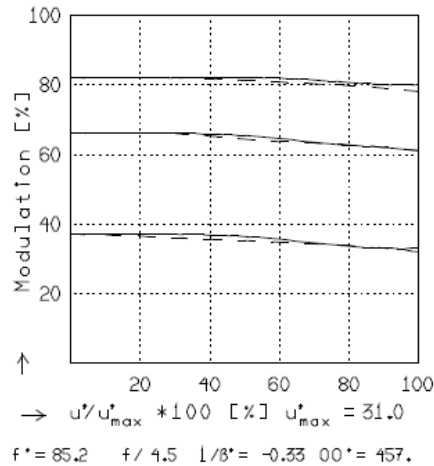
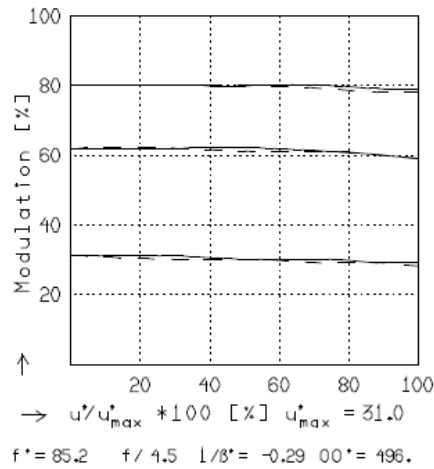
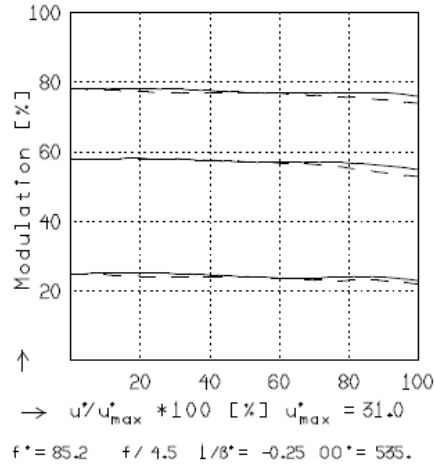
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## MRV 4.5/85

MODULATION with reference to the relative image height

Wavelength $\lambda$	[nm]	575	675	625	525	475	425
Spectral weighting	[%]	21.9	13.1	18.8	22.5	16.0	7.7
Spatial frequency R	[1/mm]	13	25	50			
Format	[mm X mm]	0.0	62.0				
Diagonal $2u^*$	[mm]	62.0					

radial ———  
 tangential - - -



Focusing :  $MTF_{max}$  at  $f / 4.5$  ,  $R = 50$  1/mm,  $u/u_{max}^* = 0$