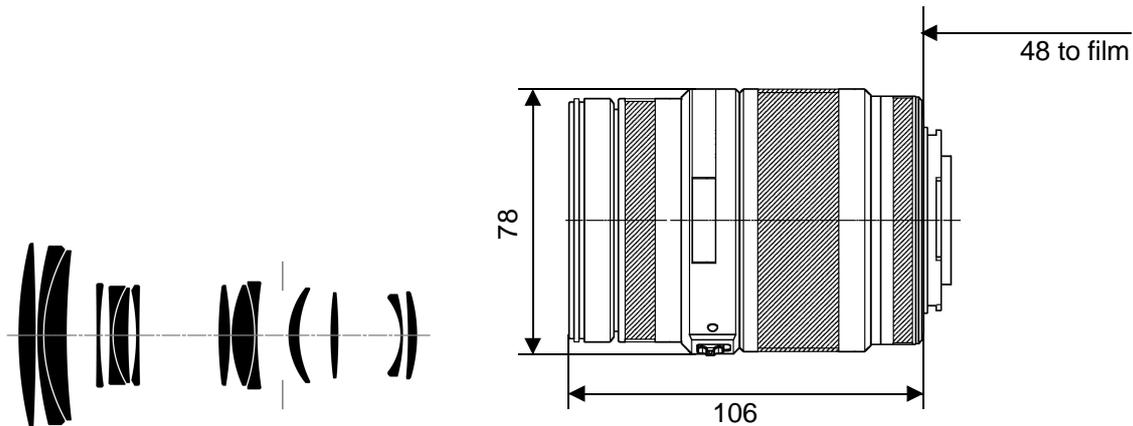


# Vario-Sonnar® T\* 3.5-4.5/70-200



CONTAX® N

The Vario-Sonnar® T\* f/3.5-4.5/70-200 lens by Carl Zeiss is a convenient tele zoom for the Contax N autofocus SLR system. It is designed with the motives and needs of the demanding travelling photographer in mind. So it has a durable precision barrel, but is relatively lightweight and small, especially in transport mode. Filters with 67 mm thread can be used at any focal length without vignetting. The Vario-Sonnar® T\* f/3.5-4.5/70-200 lens is equipped with an internal autofocus drive motor. The autofocus can be switched off if desired.

The Vario-Sonnar® T\* f/3.5-4.5/70-200 lens produces high image quality which is available at all focal lengths even at maximum f-stop in the center of the image. To achieve this high level of performance, Zeiss used optical glass types with anomalous partial dispersion for several lens elements. The Carl Zeiss T\* multi-layer anti-reflex coating of lens surfaces, combined with stray light absorbing mechanical elements in the lens barrel, enable brilliant images with vibrant colors.

**Preferred use:** general photography, portraits, travel, tourism

<b>Cat. No. of lens</b>	<b>10 47 70</b>	<b>Entrance pupil*</b>	
Number of elements	14	Position	W = 56.9 mm behind the first lens vertex T = 174.0 mm behind the first lens vertex
Number of groups	11	Diameter	W = 19.9 mm T = 41.5 mm
Max. aperture	f/3.5-4.5	<b>Exit pupil*</b>	
Focal length	W = 72.2 mm, T = 193.8 mm	Position	W = 26.7 mm in front of the last lens vertex T = 27.6 mm in front of the last lens vertex
Negative size	24 x 36 mm	Diameter	W = 18.7 mm T = 18.7 mm
Angular field 2w*	W = width 27°, height 18°, diagonal 33° T = width 11°, height 7.1°, diagonal 13°	<b>Position of principal planes*</b>	
Min. aperture	22	H	W = 51.5 mm behind the first lens vertex T = 66.0 mm in front of the last lens vertex
Camera mount	Contax N	H'	W = 31.7 mm in front of the last lens vertex T = 133.9 mm in front of the last lens vertex
Filter connection	M 67 x 0.75	<b>Back focal distance</b>	W = 40.4 mm T = 60.0 mm
Focusing range	infinity to 1 m	<b>Distance between first and last lens vertex*</b>	W = 109.5 mm T = 134.4 mm
Working distance (between mechanical front end of lens and subject)	W = 0.9 m, T = 0.8 m	<b>Weight</b>	620 g
Close limit field size	W = 325 mm x 494 mm T = 155 mm x 233 mm		
Max. scale	W = 1 : 13.4 T = 1 : 6.5		

\*at infinity



Performance data:

**Vario-Sonnar**® T\* 3.5-4.5/70-200

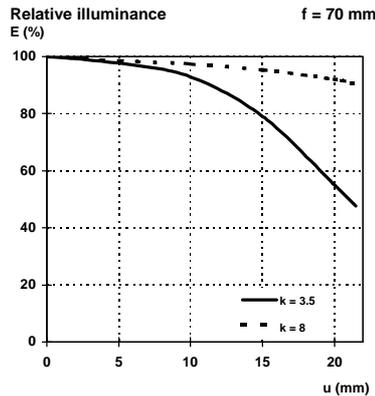
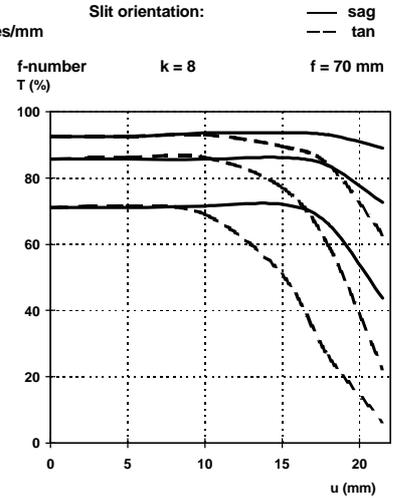
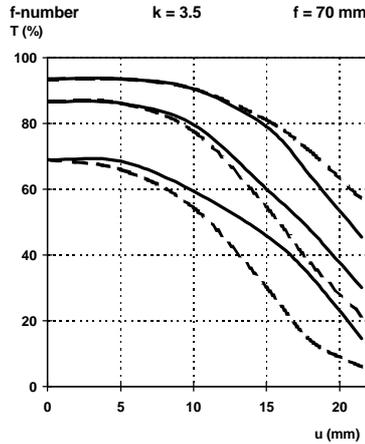
Cat. No. 10 47 70

### 1. MTF Diagrams

The image height  $u$  - calculated from the image center - is entered in mm on the horizontal axis of the graph. The modulation transfer  $T$  (MTF = Modulation Transfer Factor) is entered on the vertical axis. Parameters of the graph are the spatial frequencies  $R$  in cycles (line pairs) per mm given at the top of this page.

The lowest spatial frequency corresponds to the upper pair of curves, the highest spatial frequency to the lower pair. Above each graph, the  $f$ -number  $k$  is given for which the measurement was made. "White" light means that the measurement was made with a subject illumination having the approximate spectral distribution of daylight. Unless otherwise indicated, the performance data refer to large object distances, for which normal photographic lenses are primarily used.

Modulation transfer  $T$  as a function of image height  $u$ .  
White light. Spatial frequencies  $R = 10, 20$  and  $40$  cycles/mm



### 2. Relative illuminance

In this diagram the horizontal axis gives the image height  $u$  in mm and the vertical axis the relative illuminance  $E$ , both for full aperture and a moderately stopped-down lens. The values for  $E$  are determined taking into account vignetting and natural light decrease.

### 3. Distortion

Here again the image height  $u$  is entered on the horizontal axis in mm. The vertical axis gives the distortion  $V$  in % of the relevant image height. A positive value for  $V$  means that the actual image point is further from the image center than with perfectly distortion-free imaging (pincushion distortion); a negative  $V$  indicates barrel distortion.



Performance data:

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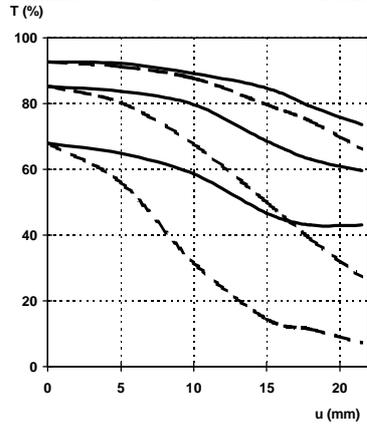
Cat. No. 10 47 70

Modulation transfer T as a function of image height u.  
White light. Spatial frequencies R = 10, 20 and 40 cycles/mm

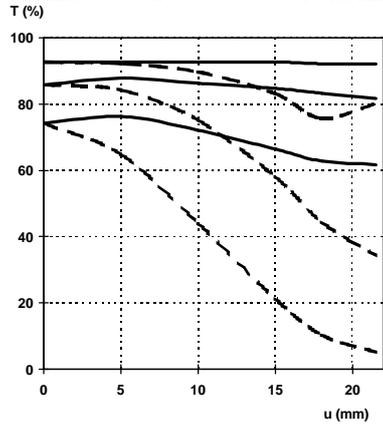
Slit orientation:

— sag  
- - - tan

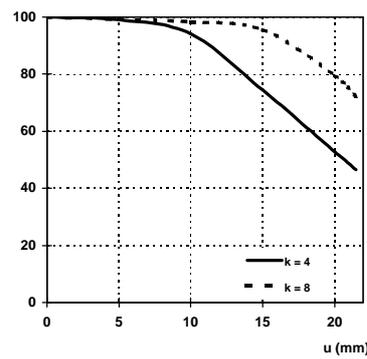
f-number k = 4 f = 150 mm



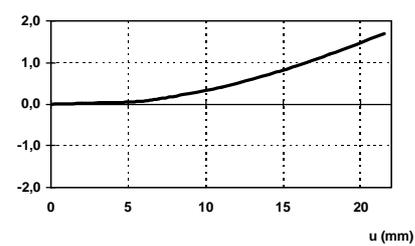
f-number k = 8 f = 150 mm



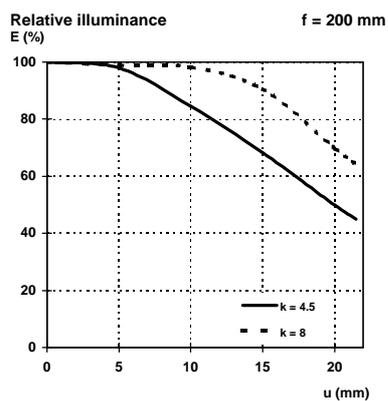
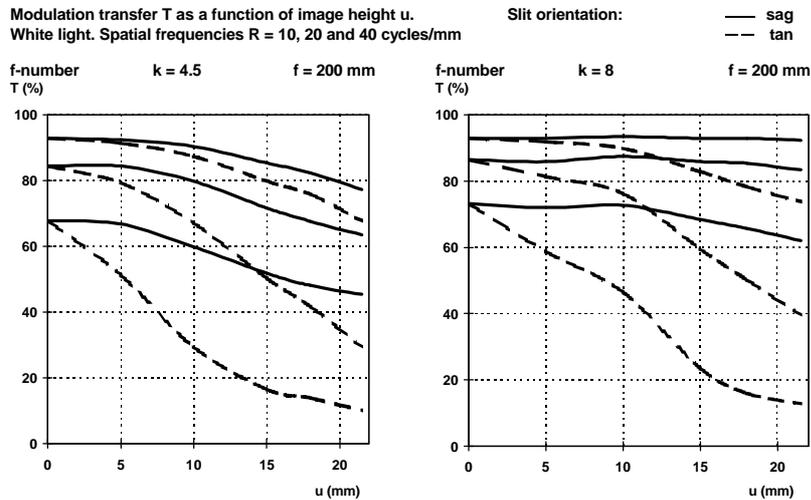
Relative illuminance E (%) f = 150 mm



Distortion in % of image height u v f = 150 mm



Performance data:  
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