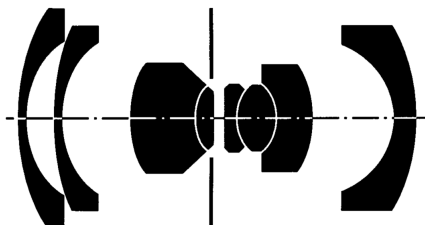


# Biogon® T\* 4,5/38



## ALPA

The Alpa medium format system is a family of cameras with superior mechanical precision and outstanding overall quality.

This makes the Alpa the ideal platform for the high performance wide angle lens Zeiss Biogon® T\* 4.5/38. Only with Alpa, the Zeiss Biogon® T\* 4.5/38 is available as interchangeable lens.

Even with the aperture fully open, the Biogon® T\* 4.5/38 lens produces beautifully sharp, brilliant photographs.

Distortion is virtually eliminated. When best imaging quality is required and reproduction requirements are high, this lens is in its element.

**Preferred use:** architectural and model photographs, demanding interiors, aerial photography and for recording technical sequences from a short distance

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|--|--|--|--|
| <b>Cat. No. of lens</b>  | <b>10 49 76</b>                                | Close limit field size                         | 266 mm x 266 mm                          |
| Number of elements   | 8  | Max. scale                                     | 1 : 4.7                                  |
| Number of groups   | 5  | Entrance pupil                                 |  |
| Max. aperture  | f/4.5  | Position                                       | 21.7 mm behind the first lens vertex     |
| Focal length   | 38.6 mm  | Diameter                                       | 8.6 mm                                   |
| Negative size  | 56 x 56 mm                                     | Exit pupil                                     |  |
| Angular field  | width 72°, height 72°,<br>diagonal 91°         | Position                                       | 21.9 mm in front of the last lens vertex |
| Min. aperture  | 32   | Diameter                                       | 9.1 mm                                   |
| Camera mount   | Alpa plate                                     | Position of principal planes                   |  |
| Shutter  | Copal 0, modified<br>(aperture with 1/3 stops) | H  | 23.9 mm behind the first lens vertex     |
|  |  | H'   | 19.6 mm behind the last lens vertex      |
| Filter connection  | M 67 x 0,75                                    | Back focal distance                            | 19.0 mm                                  |
| Focusing range   | infinity to 0.35 m                             | Distance between first<br>and last lens vertex | 76.1 mm                                  |
| Working distance (between mechanical front end of<br>lens and subject) | 0.2 m  | Distance Alpa plate<br>to film                 | 22,2 mm                                  |
|  |  | Weight   | 520 g                                    |

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Performance data:

**Biogon® T\* 4.5/38**

Cat. No. 10 49 76

### 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.

### 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.

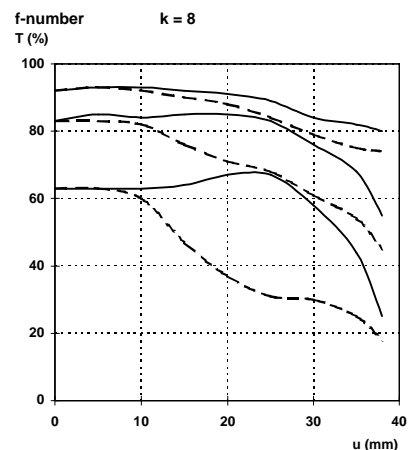
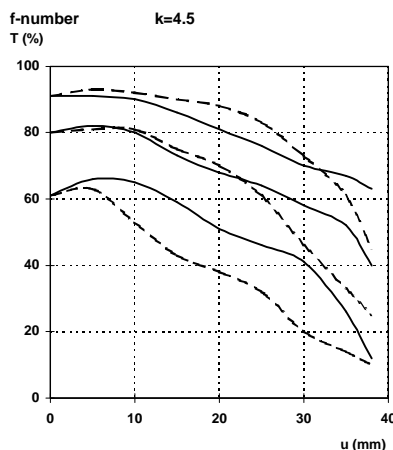
### 3. Distortion

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.

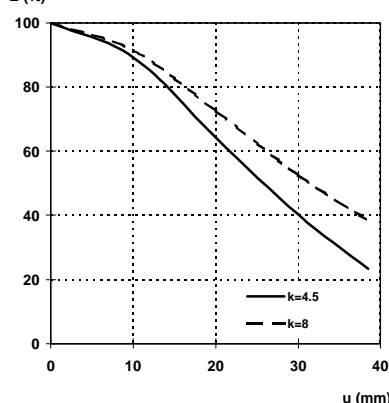
Modulation transfer  $T$  as a function of image height  $u$ .  
White light. Spatial frequencies  $R = 10, 20$  and  $40$  cycles/mm

Slit orientation:

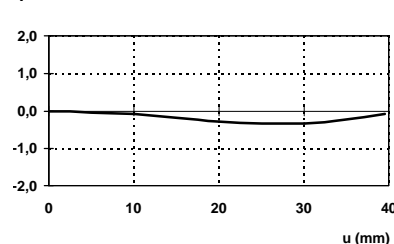
— sag  
-- tan



Relative illuminance  
 $E$  (%)



Distortion in % of image height  $u$   
 $V$



Subject to change.

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