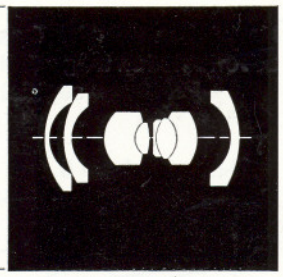
ZEISS

Biogon f/4.5 – 38 mm
Cat. No. 104117



HASSELBLAD

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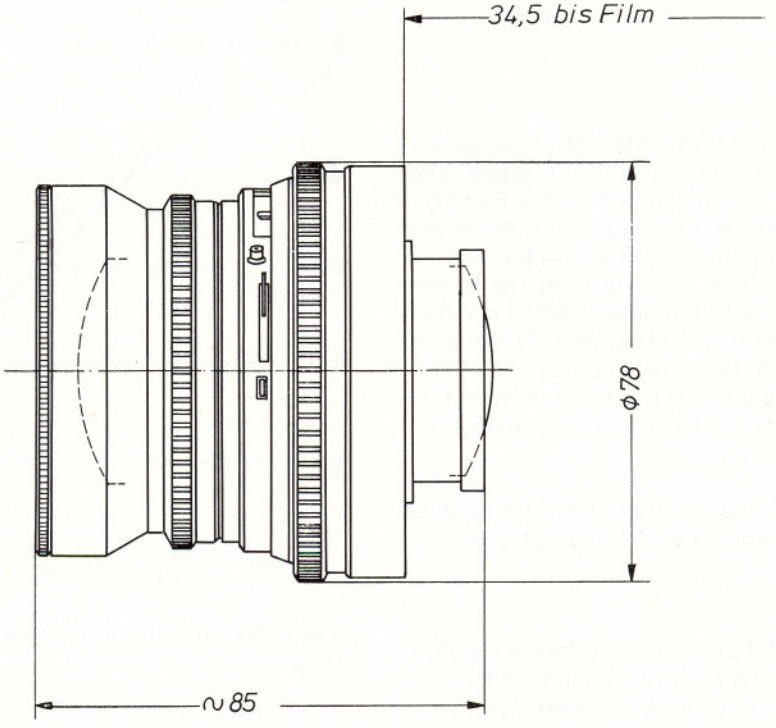
Because of the extremely short distance of the last lens vertex from the film plane (back focal distance), the BIOGON cannot be used in the Hasselblad 500 C/M - 500 EL/M. It is therefore assembled in its own special camera body, the Superwide C.

Even at full aperture the BIOGON f/4.5 - 38 mm produces pictures of outstanding sharpness and brilliance. Distortion aberration is virtually eliminated. Owing to the short focal length, there is such a large depth of focus that the fixed-focus adjustment can frequently be used.

The BIOGON is particularly suitable for architectural and model photography, for interiors and for the recording of technical processes at close range. Whenever maximum image quality has top priority and subjects of this type are to be reproduced with a minimum of distortion, the BIOGON is the best choice. For compactness and performance it cannot be beaten by any retrofocus system.



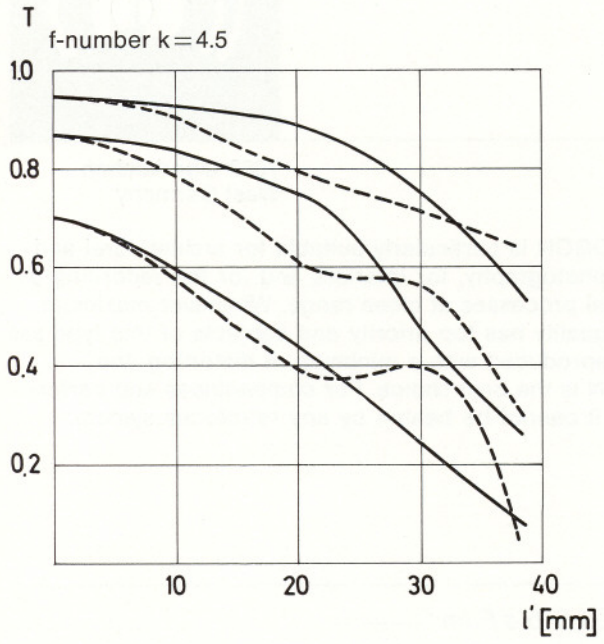
Number of lens elements:	8
Number of components:	5
f-number:	4.5
Focal length:	38.6 mm
Negative size:	56.5 x 56.5 mm
Angular field 2 w:	diagonal 90°, side 72°
Spectral range:	visible spectrum
f-stop scale:	4.5 - 5.6 - 8 - 11 - 16 - 22
Mount:	Compur shutter mounted on SWC camera body
Filter mounting:	adapter ring for Hasselblad series 63
Weight:	560 g

Distance range:	∞ to 0.3 m
Automatic depth-of-field indication for z = 0.06 mm *)	
Position of entrance pupil:	21.7 mm behind the first lens vertex
Diameter of entrance pupil:	8.6 mm
Position of exit pupil:	21.6 mm in front of the last lens vertex
Diameter of exit pupil:	9.1 mm
Position of principal plane H:	23.5 mm behind the first lens vertex
Position of principal plane H′:	19.9 mm in front of the last lens vertex
Distance between first and last lens vertex:	76.2 mm

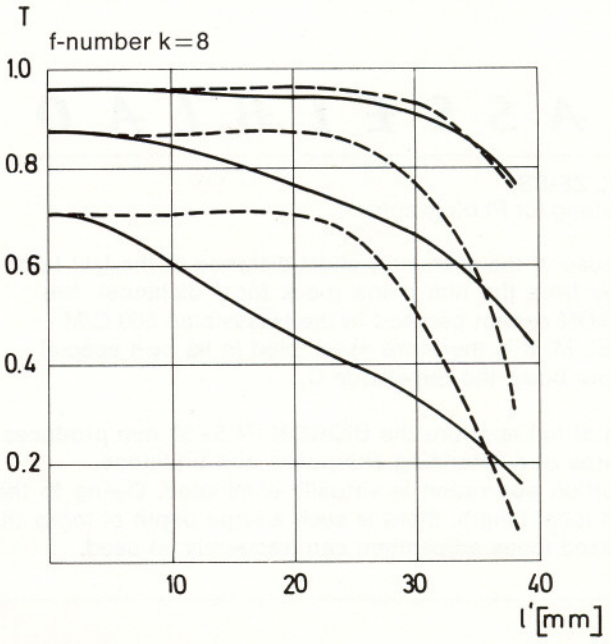
*) z = circle-of-confusion diameter

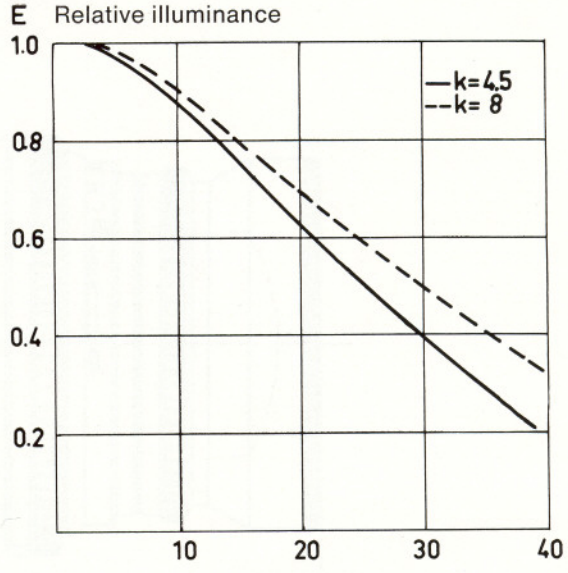
Performance data: **Biogon f/4.5 – 38 mm Cat. No. 104117**

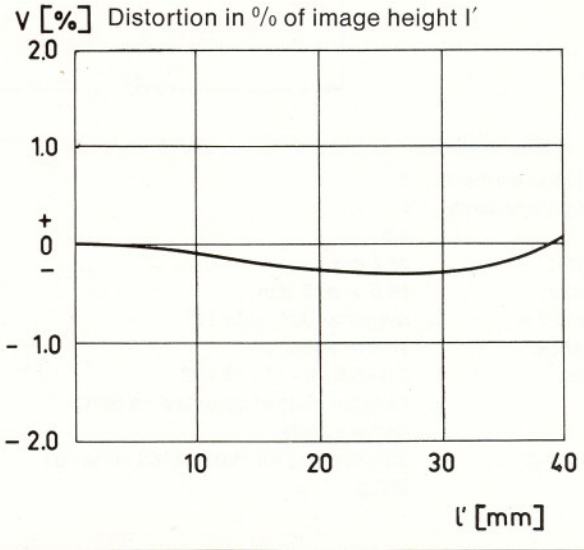
Modulation transfer T as a function of image height l′
Slit orientation tangential ————
sagittal — — — —



White light
Spatial frequencies R = 10 periods/mm 20 periods/mm 40 periods/mm







1. MTF Diagrams
The image height l′ — reckoned from the image center — is entered in mm on the horizontal axis of the graph. The modulation transfer T (MTF=**M**odulation **T**ransfer **F**actor) is entered on the vertical axis. Parameters of the graph are the spatial frequencies R in periods (line pairs) per mm given at the top right hand above the diagrams. 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 l′ 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. The natural light decrease increases with the factor "$\cos^4$ of half the angular field". It is independent of the design and degree of correction of the lens.

3. Distortion
Here again the image height l′ 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 (pin-cushion distortion); a negative V indicates barrel distortion.

Subject to technical amendment