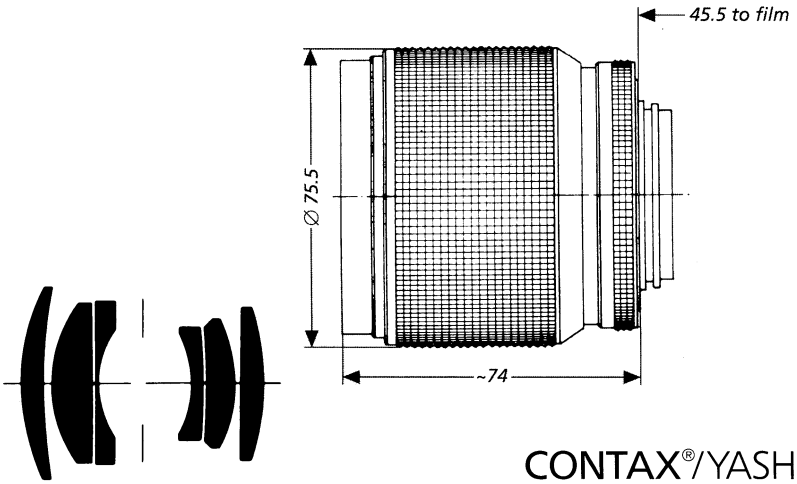
Makro-Planar® T* f/2.8 - 60 mm



CONTAX®/YASHICA® mount

The 60 mm **Makro-Planar**® f/2.8 lens is a special lens, the correction of which is optimized for close range, whereas lenses for general photography are optimized for long object distances. The design of this lens corresponds to that of an almost symmetrical **Planar**® lens, the correction of which is remarkably steady with changes of the image scale. If it is stopped down slightly more than normal taking lenses with similar focal lengths, it can also be used for long-range photography with satisfactory results.

The helical focusing mount of the lens permits the image scale to be continuously varied from 1:∞ to 1:1. The focusing scale goes down to engraving 0.27 m which corresponds to an image scale of 1:2. A second scale on the main mount permits the reading of the image scale down to 1:1.

The 60 mm **Makro-Planar**® f/2.8 lens can be recommended especially for the photographer who has to change very often between overall shots and detail photography. In animal and plant photography as well as in industrial photography the **Makro-Planar**® lens - thanks to its extremely large focusing range - ensures smooth photographic work even in rapidly changing situations.

Cat. No. of lens:	**10 77 86**
Number of elements:	6
Number of groups:	4
Max. aperture:	f/2.8 (at image scale 1:∞)
Focal length:	61.7 mm
Negative size:	24 x 36 mm
Angular field 2w*:	39º diagonal
Mount:	focusing mount with bayonet; coupling system for automatic diaphragm function; TTL metering either at full aperture or in stopped-down position.
Aperture scale:	2.8 - 4 - 5.6 - 8 - 11 - 16 - 22
Filter connection:	clip-on filter, diameter 70 mm screw-in filter, thread M 67 x 0.75 mm
Weight:	approx. 570 g
Focusing range:	1:∞ to 1:1
Entrance pupil:	
Position*:	24.2 mm behind the first lens vertex
Diameter:	21.2 mm
Exit pupil:	
Position*:	22.9 mm in front of the last lens vertex
Diameter:	21.9 mm
Position of principal planes:	
H:	25.2 mm behind the first lens vertex
H':	21.8 mm in front of the last lens vertex
Back focal distance*:	39.9 mm
Distance between first and last lens vertex:	38.0 mm

* for 1:∞

ZEISS

Performance data:

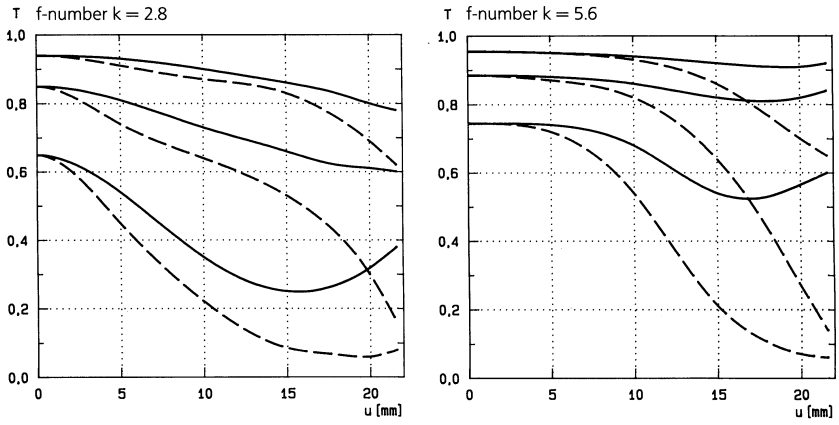
Makro-Planar® T* f/2.8 - 60 mm

Cat. No. 10 77 86

1. MTF Diagrams

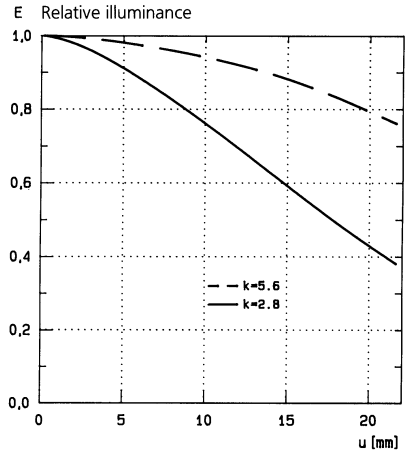
The image height u - calculated from the image center - is entered in mm on the horizontal axis of the graph. The modulation transfer T (MTF = Modulation Transfer Factor) is entered on the vertical axis. Parameters of the graph are the spatial frequencies R in cycles (line pairs) per mm given at the 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. Slit orientation: tangential — — — sagittal ———
White light. Spatial frequencies R = 10, 20 and 40 cycles/mm



2. Relative illuminance

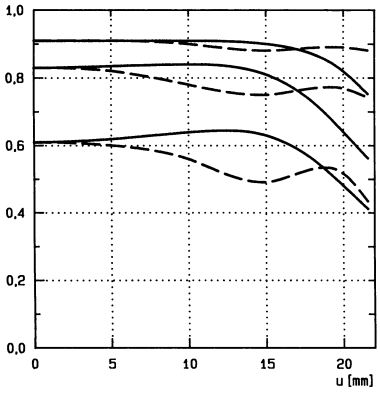
In this diagram the horizontal axis gives the image height u in mm and the vertical axis the relative illuminance E, both for full aperture and a moderately stopped-down lens. The values for E are determined taking into account vignetting and natural light decrease.



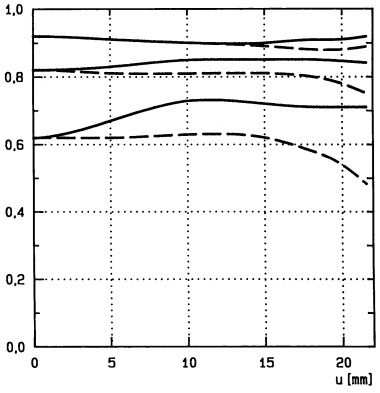
3. Distortion

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.

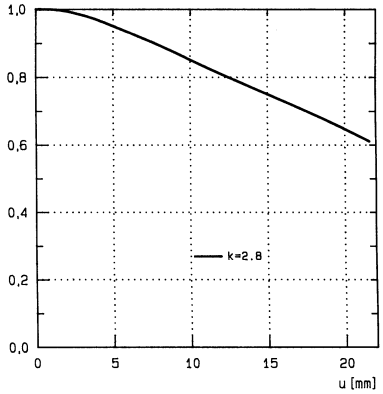
T f-number k = 2.8; i.s. = 1:10



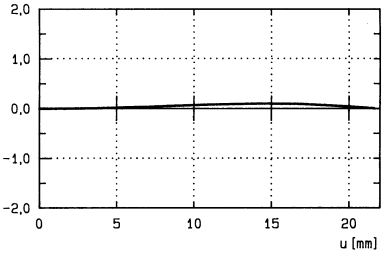
T f-number k = 5.6; i.s. = 1:10



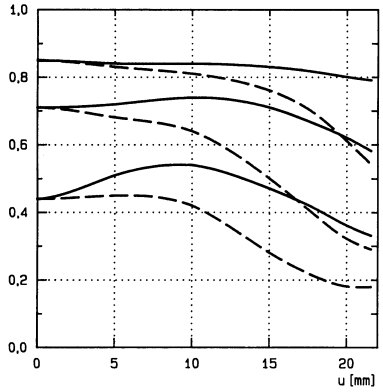
E Relative illuminance; i.s. = 1:10



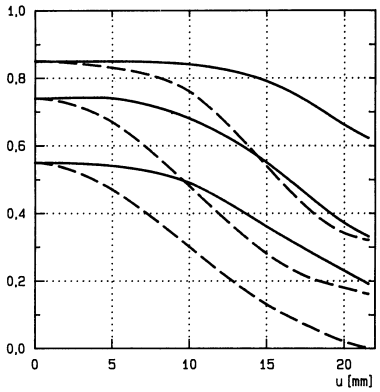
V Distortion in % of image height u; i.s. = 1:10



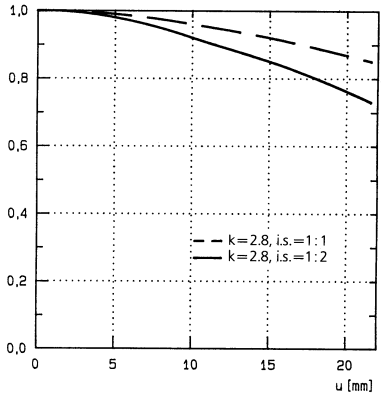
T f-number k = 5.6; i.s. = 1:2



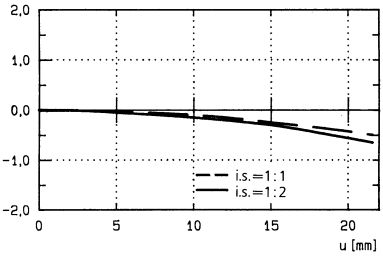
T f-number k = 5.6; i.s. = 1:1



E Relative illuminance



V Distortion in % of image height u



i.s. = image scale

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