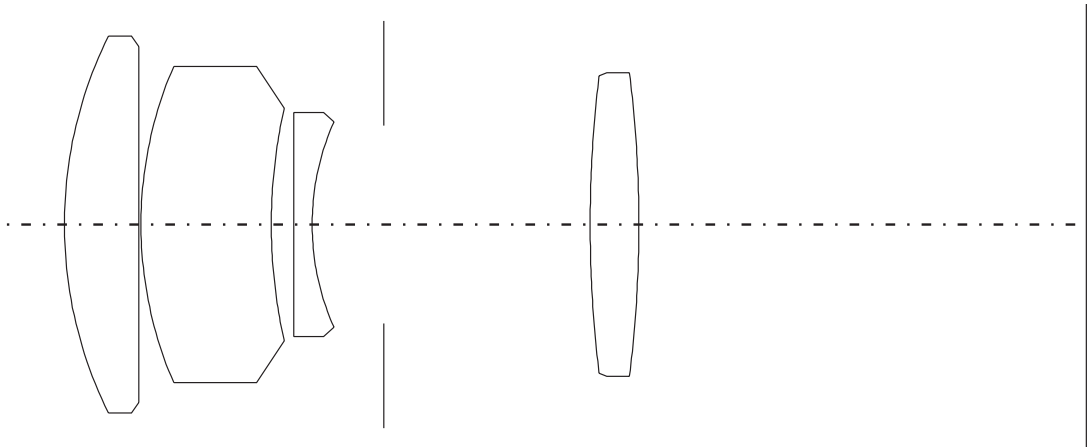




A compact, medium focal length featuring very good contrast and sharpness across the entire picture area – even at full aperture. Vignetting too, is hardly discernible with the lens wide open. Natural-looking portraiture with an out-of-focus background is an optimal task for this slightly longer focal length and the f/2.8 aperture. The black version of this lens weighs slightly more than 400 g (14 oz) and it is only a little longer than a 50 mm lens. In combination with the Tri-Elmar lens, this light tele lens forms an outstanding, compact travel outfit with universal applications.

— Lens shape



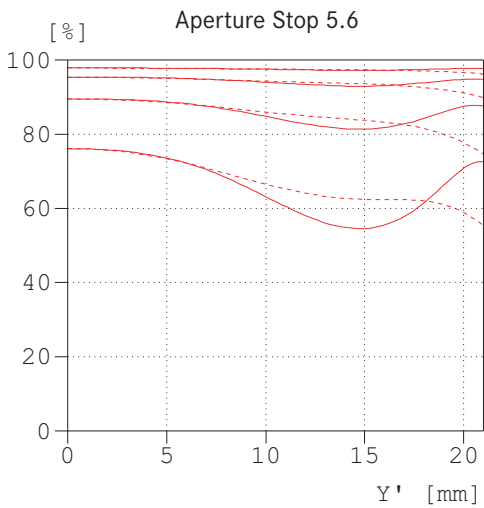
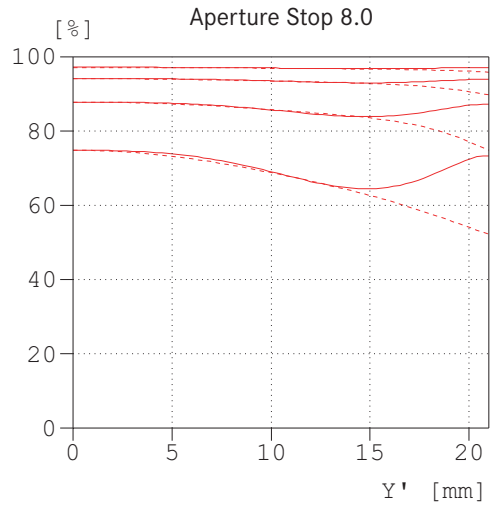
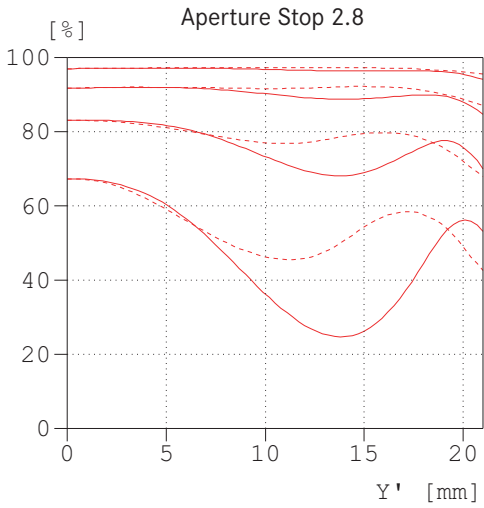


— Engineering drawing

Technical Data

Angle of view (diagonal, horizontal, vertical)	27°, 23°, 15°
Optical design	Number of elements / groups: 4 / 4 Focal length: 91 mm Entrance pupil: 42.3 mm (related to the first lens surface in light direction) Focusing range: 1m to Infinity
Distance setting	Scale: combined meter/feet-increments Smallest object field: 220 mm x 330 mm Highest reproduction ratio: 1:9
Diaphragm	Setting / Type: with clickstops (including half values), manual diaphragm Smallest aperture: f/22
Bayonet	Leica M quick-change bayonet
Filter (type)	internal thread for screw-in type filters E 46
Lens hood	built-in, telescopic
Dimensions and weight	Length: 76 mm Largest diameter: 56.5 mm Weight: approx. 410 g / 560 g (black anodized- / silver chrome finish)

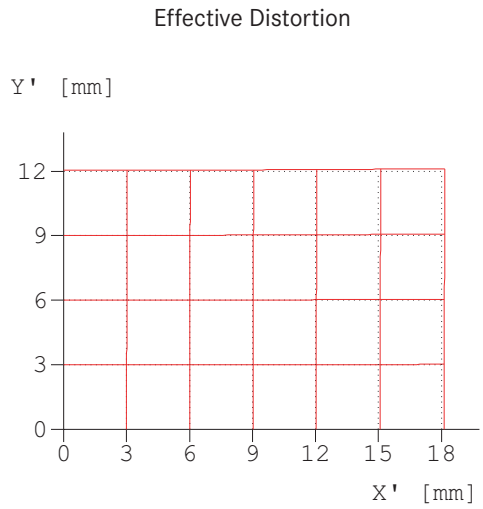
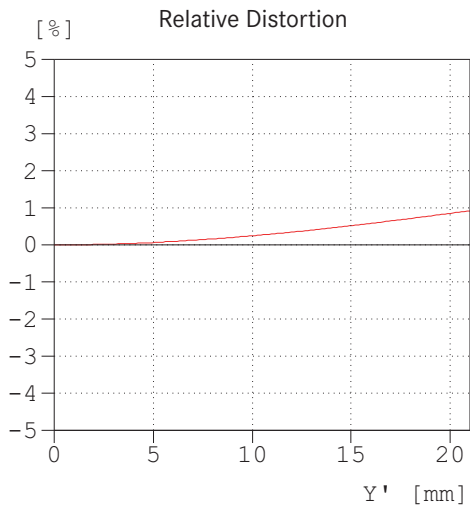
— MTF graphs



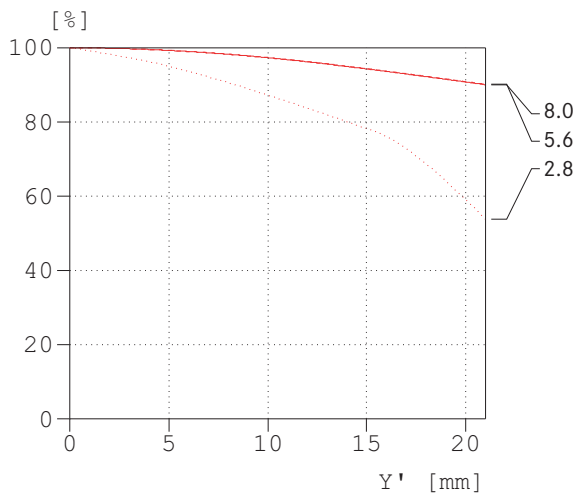
The MTF is indicated both at full aperture and at f/5.6 at long taking distances (infinity). Shown is the contrast in percentage for 5, 10, 20 and 40 lp/mm across the height of the 35 mm film format, for tangential (dotted line) and sagittal (solid line) structures, in white light. The 5 and 10 lp/mm will give an indication regarding the contrast ratio for large object structures. The 20 and 40 lp/mm records the resolution of finer and finest object structures.

- sagittal structures
- - - tangential structures

— Distortion



— Vignetting



Distortion is the deviation of the real image height (in the picture) from the ideal image height. The relative distortion is the percentage deviation. The ideal image height results from the object height and the magnification. The image height of 21.6mm is the radial distance between the edge and the middle of the image field for the format 24mm x 36mm. The graph of the effective distortion illustrates the appearance of straight horizontal and vertical lines in the picture.

Vignetting is a continuous decrease of the illumination to the edges of the image field. The graph shows the percentage lost of illumination over the image height. 100% means no vignetting.

- sagittal structures
- - - tangential structures



Depth of field table

Distance Setting [m]	Aperture Stop							Magnification
	2,8	4	5,6	8	11	16	22	
1	0,990 - 1,010	0,986 - 1,014	0,981 - 1,020	0,973 - 1,029	0,963 - 1,040	0,947 - 1,059	0,929 - 1,083	1/9,02
1,2	1,186 - 1,215	1,180 - 1,221	1,172 - 1,230	1,160 - 1,243	1,146 - 1,260	1,123 - 1,289	1,097 - 1,326	1/11,2
1,7	1,670 - 1,731	1,658 - 1,744	1,642 - 1,762	1,619 - 1,790	1,590 - 1,827	1,545 - 1,891	1,494 - 1,975	1/16,8
2	1,959 - 2,043	1,942 - 2,062	1,920 - 2,088	1,887 - 2,128	1,848 - 2,180	1,787 - 2,274	1,718 - 2,397	1/20,1
3	2,906 - 3,100	2,868 - 3,145	2,819 - 3,206	2,748 - 3,304	2,664 - 3,435	2,536 - 3,679	2,397 - 4,022	1/31,1
4	3,833 - 4,182	3,767 - 4,264	3,681 - 4,380	3,560 - 4,566	3,419 - 4,823	3,208 - 5,323	2,988 - 6,081	1/42,1
7	6,499 - 7,586	6,309 - 7,863	6,069 - 8,272	5,742 - 8,972	5,381 - 10,04	4,870 - 12,51	4,374 - 17,79	1/75,0
∞	89,23 - ∞	62,86 - ∞	44,91 - ∞	31,45 - ∞	22,88 - ∞	15,75 - ∞	11,47 - ∞	1/∞

