

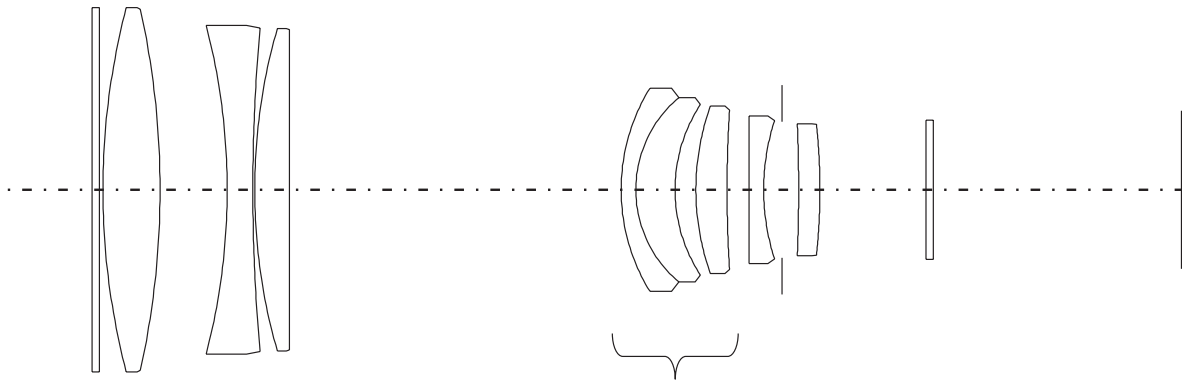


LEICA APO-TELYT-R 280 mm f/2.8



In the long telephoto range, the module system produces extraordinarily clear pictures with high contrast and accuracy in detail rendition and color reproduction. And because even the smallest mechanical weaknesses can significantly reduce the performance, especially in this range of focal lengths, the Leica module system is fabricated and assembled with extremely tight tolerances. Nature and animal photographers in particular, who use several focal lengths in this range, will value this system: Perhaps because they can save space with the combination of one lens head with two or three focusing modules, and/or because the smooth and easy focusing effectively supports precise settings in which the subject “springs into focus”.

— Lens shape



Internal focussing

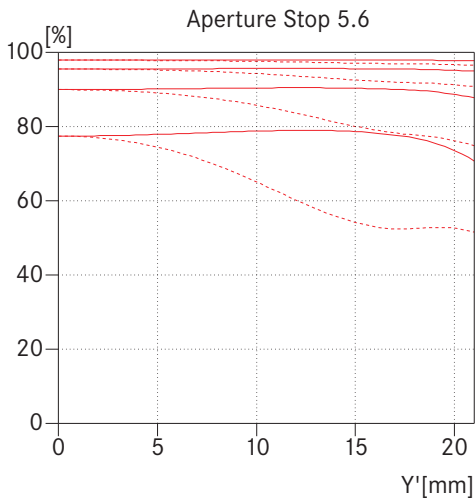
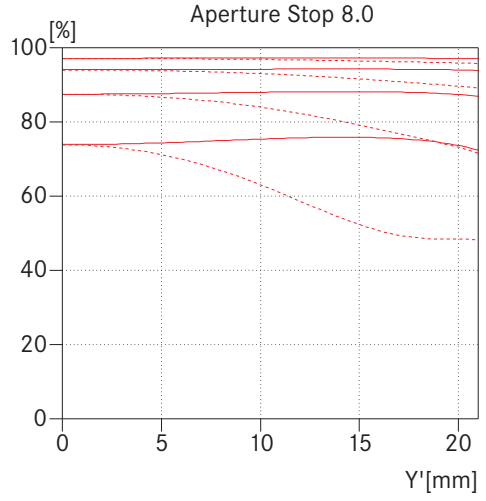
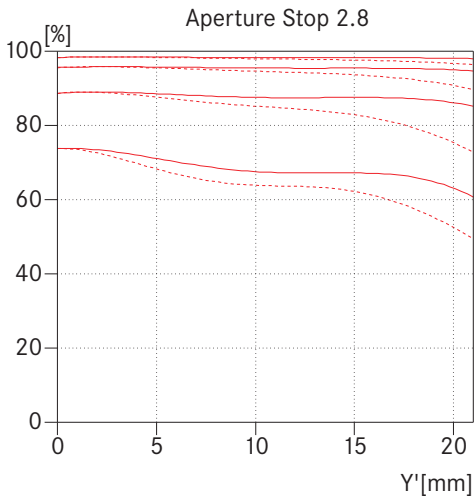


— Engineering drawing

Technical Data

Angle of view (diagonal, horizontal, vertical)	8.8°, 7.4°, 4.9°
Optical design	Number of elements / groups: 8 / 7 Focal length: 280 mm Entrance pupil: 408 mm (related to the first lens surface in light direction) Focusing range: 2 m to Infinity, can be focused beyond infinity, focusing does not have to be corrected for IR-photography
Distance setting	Scale: Combined meter/feet-increments Smallest object field: 146 mm x 220 mm Highest reproduction ratio: 1:6.1
Diaphragm	Setting / Type: Preset diaphragm with clickstops (including half values), Fully automatic diaphragm Smallest aperture: f/22
Bayonet	LEICA R quick-change bayonet for LEICA R3 to LEICA R9 with mechanical, and, for LEICA R8/R9, additional electronic exposure control
Filter (type)	Series 6 filters in filter drawer
Lens hood	Built-in, telescopic, rubber-armored front edge
Dimensions and weight	Length: 276 mm Largest diameter: 125 mm Weight: approx. 3.740 g

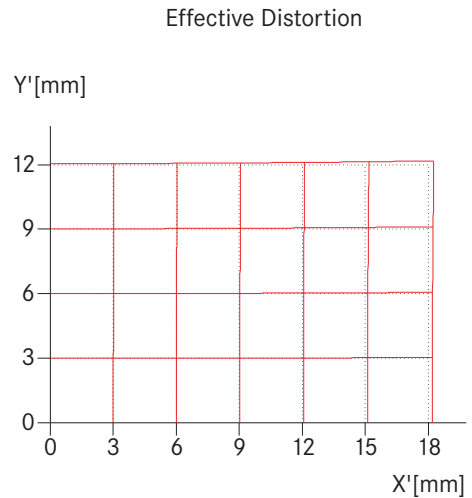
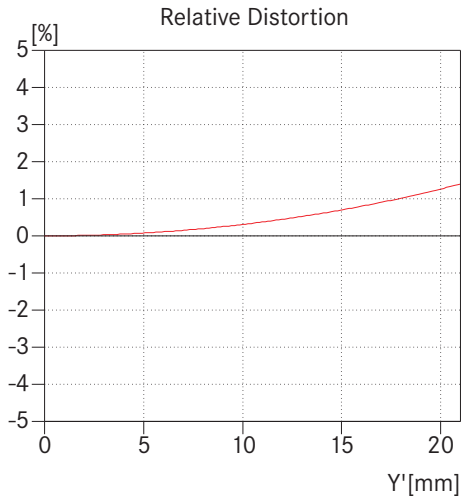
— MTF graphs



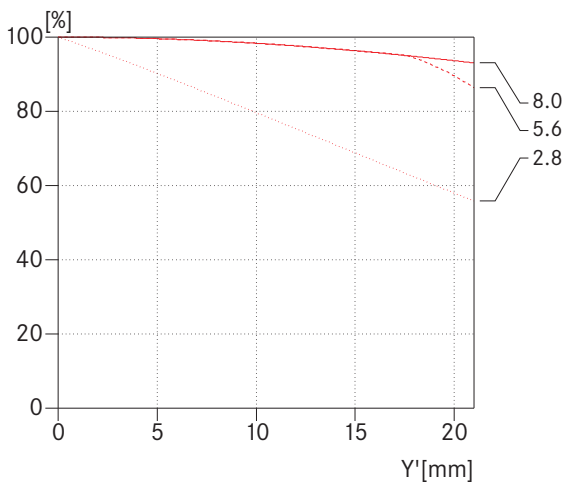
The MTF is indicated both at full aperture and at f/5.6 at long taking distances (infinity). Shown is the contrast in percentage for 5, 10, 20 and 40 lp/mm across the height of the 35 mm film format, for tangential (dotted line) and sagittal (solid line) structures, in white light. The 5 and 10 lp/mm 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	
2	1,993 - 2,007	1,992 - 2,008	1,989 - 2,011	1,985 - 2,015	1,979 - 2,021	1,970 - 2,031	1,959 - 2,042	1/6,03
2,5	2,490 - 2,510	2,489 - 2,511	2,484 - 2,516	2,477 - 2,523	2,469 - 2,532	2,455 - 2,547	2,438 - 2,565	1/7,83
3	2,986 - 3,014	2,984 - 3,016	2,977 - 3,023	2,968 - 3,033	2,956 - 3,045	2,937 - 3,066	2,913 - 3,092	1/9,63
3,5	3,482 - 3,518	3,478 - 3,522	3,470 - 3,531	3,457 - 3,544	3,441 - 3,561	3,415 - 3,589	3,384 - 3,624	1/11,4
4	3,977 - 4,023	3,972 - 4,028	3,961 - 4,040	3,944 - 4,057	3,924 - 4,079	3,890 - 4,116	3,850 - 4,161	1/13,2
4,5	4,472 - 4,528	4,465 - 4,536	4,451 - 4,550	4,430 - 4,572	4,404 - 4,600	4,362 - 4,646	4,313 - 4,704	1/15,0
5	4,966 - 5,035	4,957 - 5,044	4,940 - 5,062	4,914 - 5,089	4,883 - 5,123	4,831 - 5,181	4,771 - 5,252	1/16,8
6	5,952 - 6,049	5,938 - 6,063	5,914 - 6,089	5,878 - 6,127	5,833 - 6,176	5,760 - 6,260	5,675 - 6,363	1/20,4
8	7,918 - 8,084	7,892 - 8,111	7,849 - 8,157	7,786 - 8,226	7,708 - 8,314	7,583 - 8,465	7,437 - 8,654	1/27,5
10	9,874 - 10,13	9,832 - 10,17	9,766 - 10,25	9,669 - 10,35	9,550 - 10,49	9,359 - 10,73	9,139 - 11,04	1/34,6
12	11,82 - 12,18	11,76 - 12,25	11,67 - 12,35	11,53 - 12,51	11,36 - 12,72	11,09 - 13,07	10,78 - 13,52	1/41,8
15	14,72 - 15,29	14,63 - 15,39	14,48 - 15,56	14,27 - 15,81	14,02 - 16,13	13,61 - 16,70	13,15 - 17,44	1/52,5
20	19,52 - 20,50	19,34 - 20,70	19,09 - 21,00	18,73 - 21,45	18,29 - 22,05	17,61 - 23,13	16,85 - 24,58	1/70,3
30	28,94 - 31,13	28,55 - 31,60	28,01 - 32,29	27,24 - 33,38	26,33 - 34,86	24,94 - 37,62	23,45 - 41,58	1/106
50	47,16 - 53,20	46,11 - 54,60	44,72 - 56,69	42,78 - 60,13	40,59 - 65,08	37,39 - 75,40	34,15 - 93,13	1/177
100	89,33 - 113,6	85,60 - 120,2	80,93 - 130,8	74,81 - 150,7	68,35 - 186,1	59,75 - 305,4	51,91 - 1326	1/356
∞	843,5 - ∞	595,4 - ∞	425,1 - ∞	297,5 - ∞	216,4 - ∞	148,7 - ∞	108,1 - ∞	1/∞

