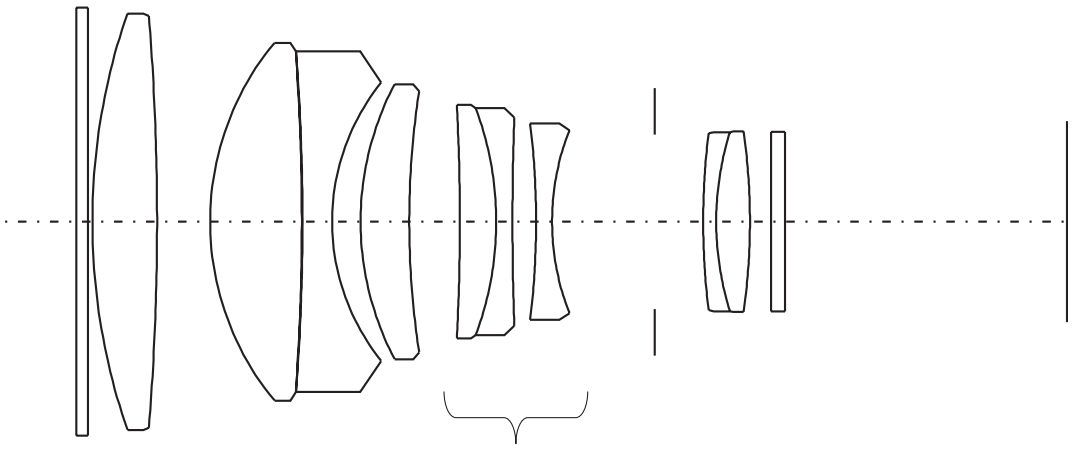
This extremely fast tele lens with apochromatic correction guarantees flawless image quality all the way to the edges – and it does so from infinity to the near focusing limit of 1.5 m (4'10"). With its aperture wide open, it produces images with maximal contrast, highest resolution and differentiated color rendition. The system includes a protective filter for the front lens element and a filter in the filter drawer. Thanks to its rubber-armored lens hood, the lens is protected effectively against damage from impact. The sum of its properties makes the LEICA APO-SUMMICRON-R 180 mm f/2 the ideal tele lens for situations of poor lighting conditions and where longer distances have to be bridged. Selective focus makes photographs possible with an impressive feeling of depth, and the combination of internal focusing and a wide focusing ring allow silky-smooth and pin-point-accurate focusing. Working with a tripod is made easy by a robust tripod base that can be rotated and locked in place.

Lens shape

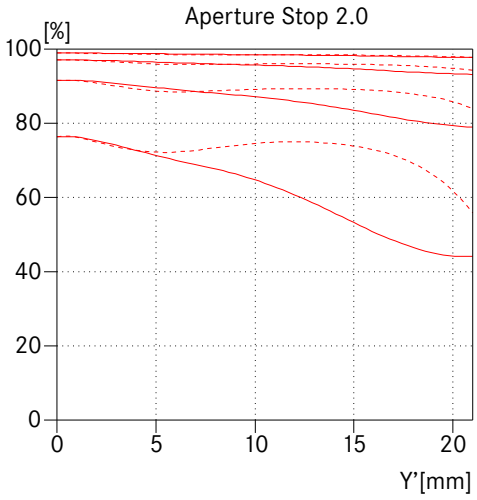


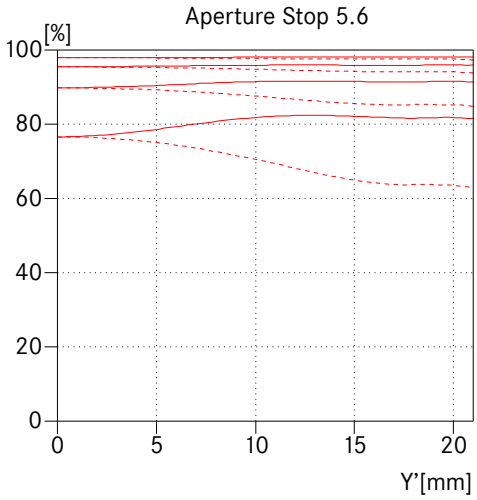
Internal focussing

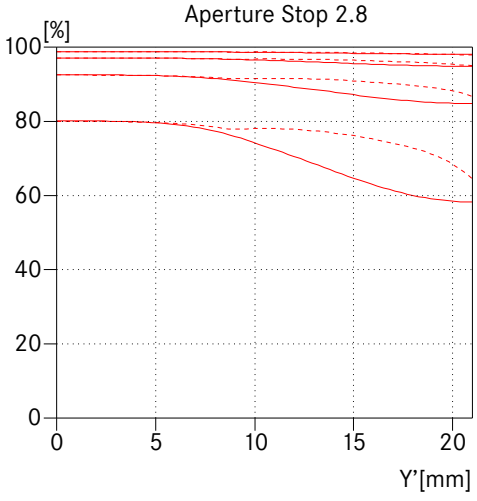
Engineering drawing

Technical Data	
Angle of view (diagonal, horizontal, vertical)	13.7°, 11.4°, 7.6°
Optical design	**Number of elements / groups:** 9 / 6, built-in protective filter in front of front lens element **Focal length:** 179 mm **Entrance pupil:** 294 mm (related to the first lens surface in light direction) **Focusing range:** 1.50 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:** 160 mm x 240 mm **Highest reproduction ratio:** 1:6.7
Diaphragm	**Setting / Type:** Preset diaphragm with clickstops (including half values), Fully automatic diaphragm **Smallest aperture:** f/16
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, additional internal thread for screw-in type filters E 100
Lens hood	Built-in, telescopic, rubber-armored
Dimensions and weight	**Length:** 176 mm **Largest diameter:** 116 mm **Weight:** approx. 2.500 g

MTF graphs





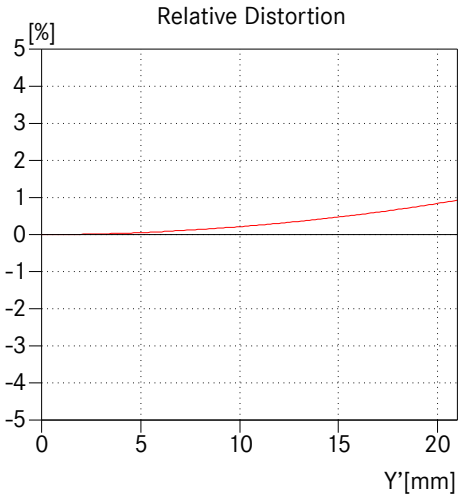


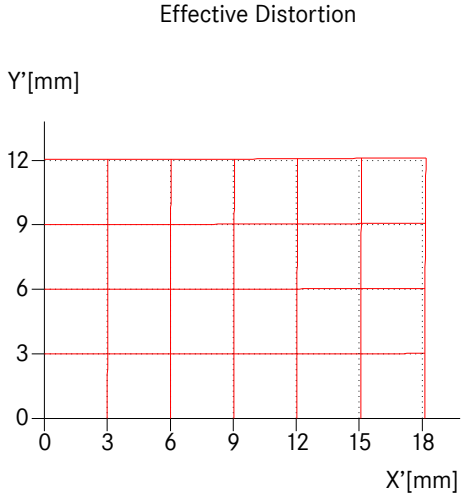
The MTF is indicated both at full aperture and at f/5.6 at long taking distances (infinity). Shown is the contrast in percentage for 5, 10, 20 and 40 lp/mm accross the height of the 35 mm film format, for tangential (dotted line) and sagittal (solid line) structures, in white light. The 5 and 10 lp/mm 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

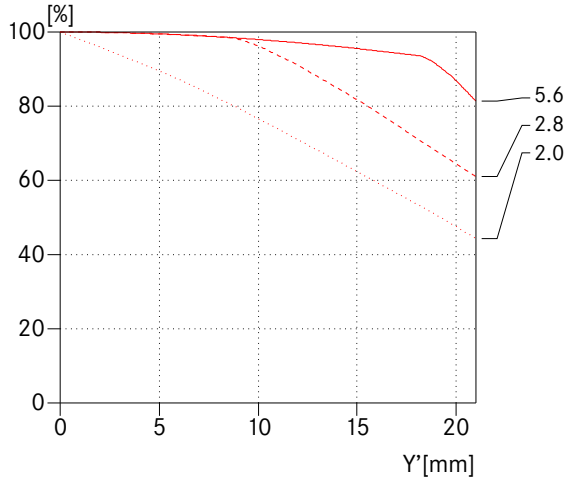
tangential structures

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.

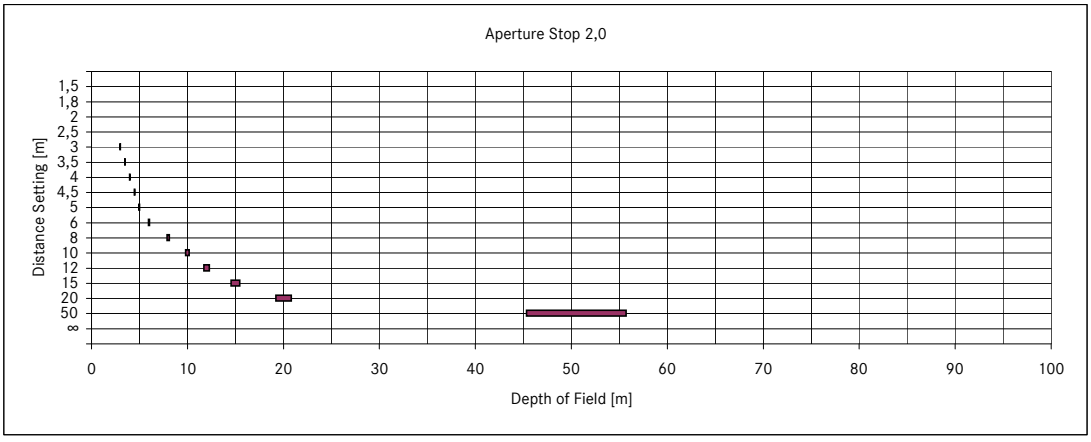
Vignetting is a continous decrease of the illumination to the edges of the image field. The graph shows the percentage lost of illumination over the image height. 100% means no vignetting.

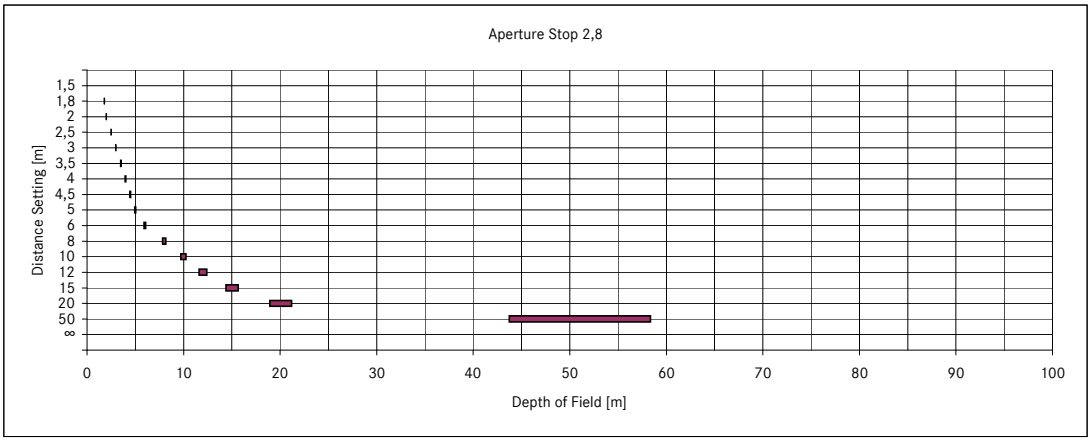
sagittal structures

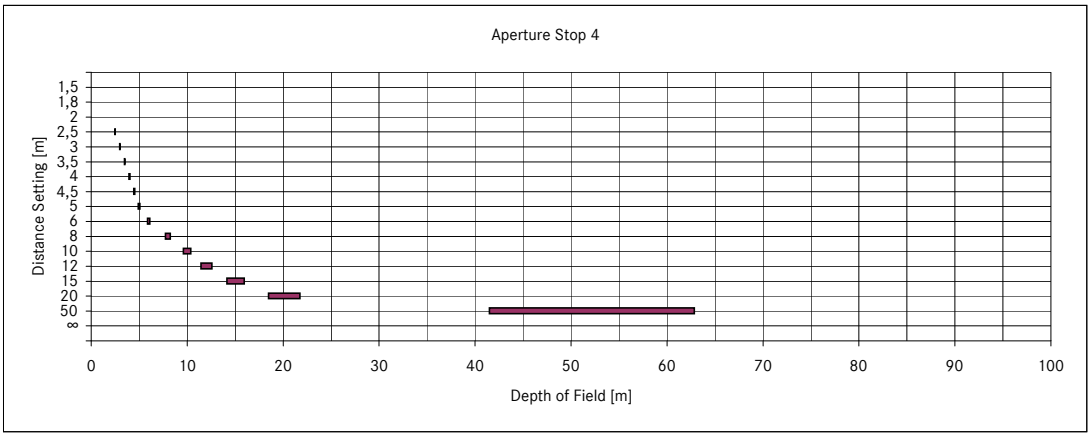
tangential structures

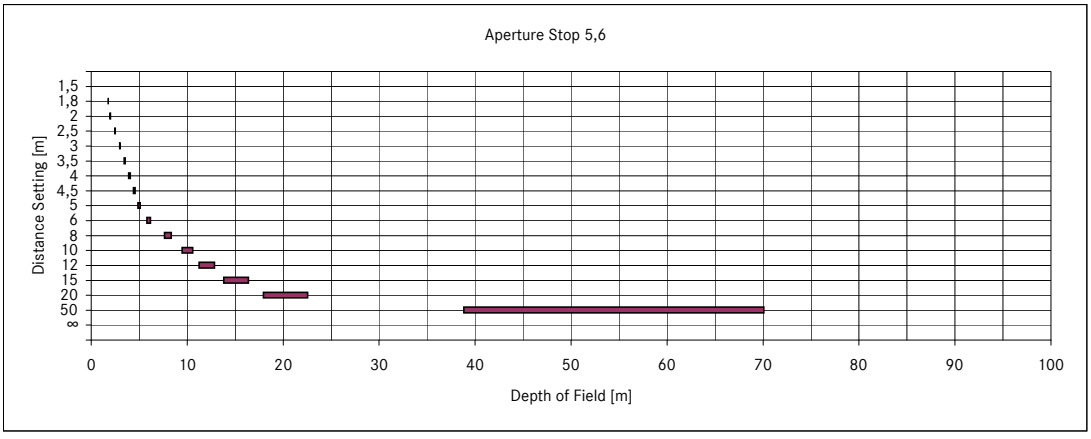
Depth of field table

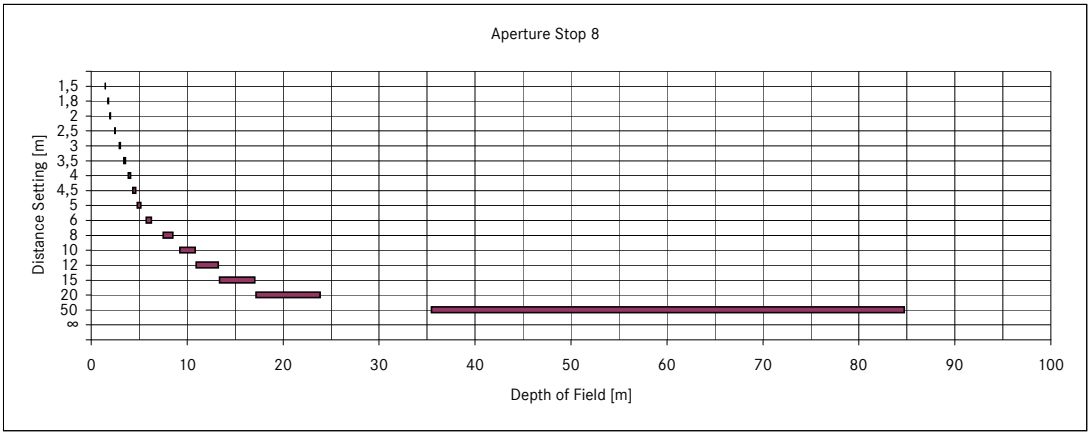
Distance Setting [m]	Aperture Stop 2,0	2,8	4	5,6	8	11	16	Magnification
1,5	1,495 - 1,505	1,494 - 1,506	1,492 - 1,509	1,488 - 1,512	1,483 - 1,517	1,477 - 1,524	1,467 - 1,535	1/6,73
1,8	1,793 - 1,807	1,791 - 1,809	1,788 - 1,812	1,783 - 1,817	1,776 - 1,825	1,767 - 1,835	1,752 - 1,851	1/8,41
2	1,992 - 2,008	1,989 - 2,011	1,985 - 2,015	1,979 - 2,022	1,970 - 2,031	1,959 - 2,043	1,941 - 2,063	1/9,52
2,5	2,487 - 2,513	2,483 - 2,517	2,476 - 2,524	2,467 - 2,534	2,453 - 2,549	2,435 - 2,568	2,407 - 2,600	1/12,3
3	2,982 - 3,019	2,976 - 3,025	2,965 - 3,035	2,952 - 3,050	2,932 - 3,072	2,907 - 3,099	2,866 - 3,146	1/15,1
3,5	3,475 - 3,525	3,467 - 3,534	3,453 - 3,549	3,434 - 3,568	3,407 - 3,598	3,373 - 3,637	3,318 - 3,702	1/17,9
4	3,967 - 4,033	3,956 - 4,045	3,938 - 4,064	3,914 - 4,090	3,878 - 4,130	3,834 - 4,181	3,763 - 4,268	1/20,7
4,5	4,459 - 4,542	4,445 - 4,557	4,421 - 4,581	4,391 - 4,615	4,345 - 4,666	4,290 - 4,731	4,201 - 4,844	1/23,5
5	4,949 - 5,052	4,932 - 5,070	4,903 - 5,101	4,865 - 5,143	4,809 - 5,206	4,741 - 5,288	4,632 - 5,430	1/26,3
6	5,927 - 6,075	5,901 - 6,102	5,860 - 6,147	5,805 - 6,208	5,726 - 6,301	5,629 - 6,422	5,475 - 6,634	1/31,9
8	7,871 - 8,133	7,824 - 8,184	7,751 - 8,265	7,655 - 8,377	7,517 - 8,549	7,350 - 8,775	7,088 - 9,178	1/43,0
10	9,799 - 10,21	9,725 - 10,29	9,612 - 10,42	9,465 - 10,60	9,253 - 10,88	9,000 - 11,25	8,608 - 11,92	1/54,2
12	11,71 - 12,30	11,61 - 12,42	11,44 - 12,61	11,24 - 12,88	10,94 - 13,29	10,58 - 13,85	10,04 - 14,89	1/65,4
15	14,55 - 15,48	14,39 - 15,67	14,14 - 15,97	13,82 - 16,40	13,37 - 17,08	12,85 - 18,02	12,06 - 19,83	1/82,2
20	19,21 - 20,86	18,92 - 21,21	18,49 - 21,77	17,95 - 22,58	17,19 - 23,89	16,33 - 25,77	15,08 - 29,66	1/110
50	45,33 - 55,73	43,72 - 58,38	41,49 - 62,89	38,84 - 70,13	35,45 - 84,74	31,96 - 114,6	27,45 - 276,7	1/278
∞	485,2 - ∞	346,7 - ∞	242,7 - ∞	173,3 - ∞	121,3 - ∞	88,18 - ∞	60,6 - ∞	1/∞

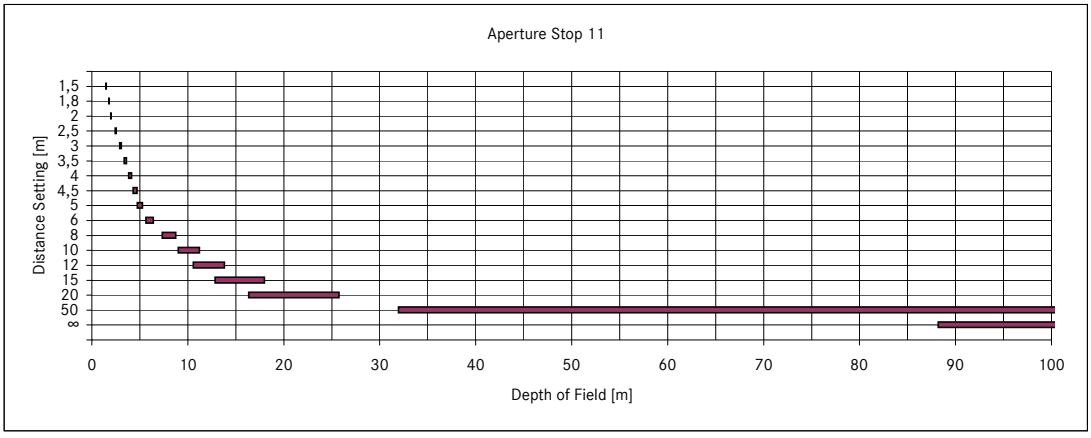


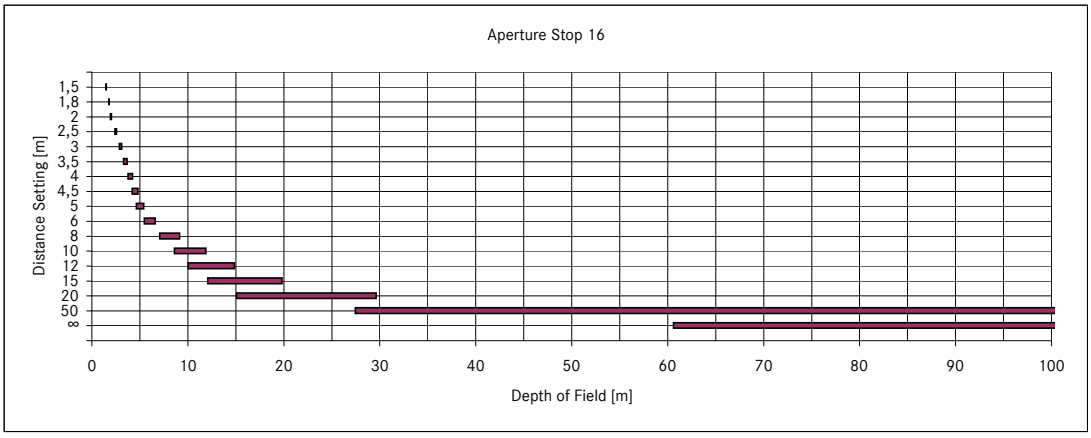



Aperture Stop 4
Distance Setting [m]
1,5
1,8
2
2,5
3
3,5
4
4,5
5
6
8
10
12
15
20
50
∞
0
10
20
30
40
50
60
70
80
90
100
Depth of Field [m]


Aperture Stop 5,6
Distance Setting [m]
1,5
1,8
2
2,5
3
3,5
4
4,5
5
6
8
10
12
15
20
50
∞
0
10
20
30
40
50
60
70
80
90
100
Depth of Field [m]


Aperture Stop 8
Distance Setting [m]
1,5
1,8
2
2,5
3
3,5
4
4,5
5
6
8
10
12
15
20
50
∞
0
10
20
30
40
50
60
70
80
90
100
Depth of Field [m]


Aperture Stop 11
Distance Setting [m]
1,5
1,8
2
2,5
3
3,5
4
4,5
5
6
8
10
12
15
20
50
∞
0
10
20
30
40
50
60
70
80
90
100
Depth of Field [m]


Aperture Stop 16
Distance Setting [m]
1,5
1,8
2
2,5
3
3,5
4
4,5
5
6
8
10
12
15
20
50
∞
0
10
20
30
40
50
60
70
80
90
100
Depth of Field [m]