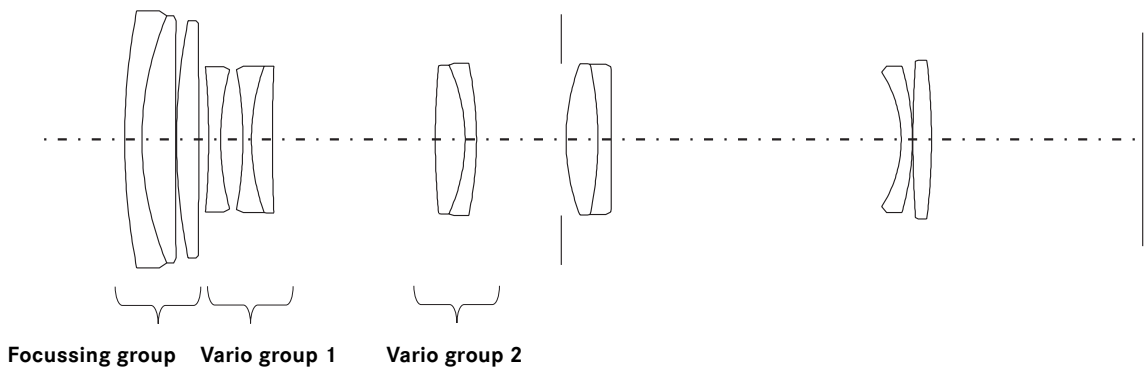




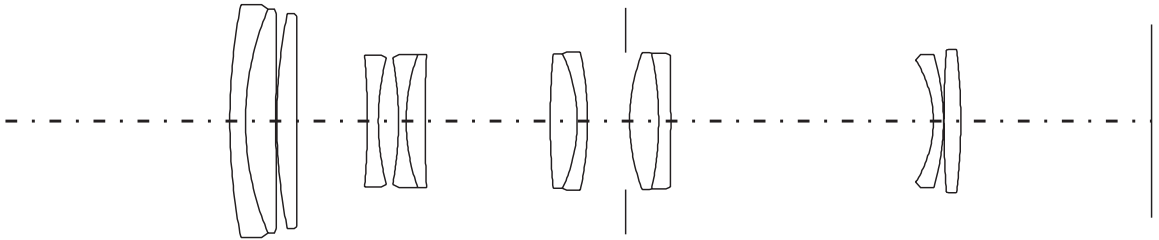
A very good imaging performance with high resolving power and contrast at full aperture, across the entire picture area and over the complete zoom range – that is a succinct description of this lens, which stands in comparison to the best lenses with fixed focal lengths. Coma and spherical aberration are very low and can be largely eliminated by slightly stopping down the aperture. The illumination of the picture area is uniform at all focal length settings, and in the close-up range down to 1.1 m (43.25 inches), the lens renders a reproduction ratio of 1:3.9. Thanks to its compact size it is a lightweight lens, which, together with its smooth focusing makes it a universal lens for traveling. In combination with the 21-35 mm and 35-70 mm Leica zoom lenses, one can, with only three lenses, achieve a stepless 1 to 10 range of focal lengths – and a uniformly high imaging quality.

— Lens shape 80 mm

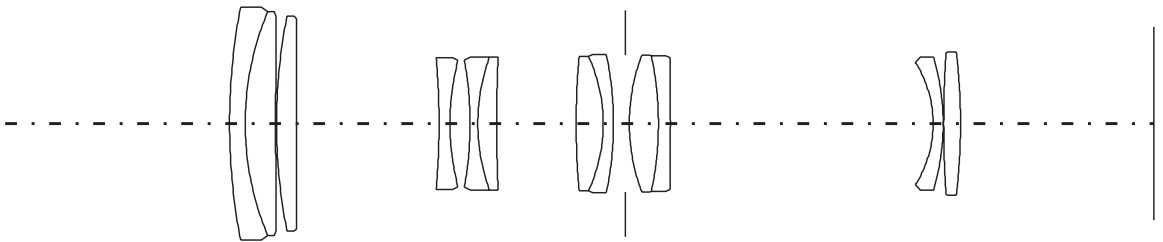




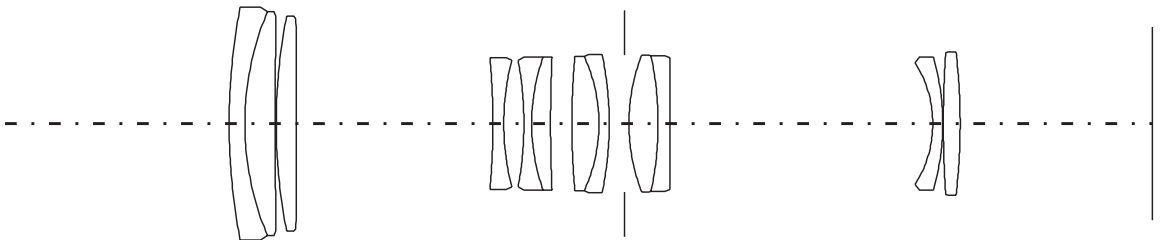
— Lens shape 100 mm



— Lens shape 135 mm



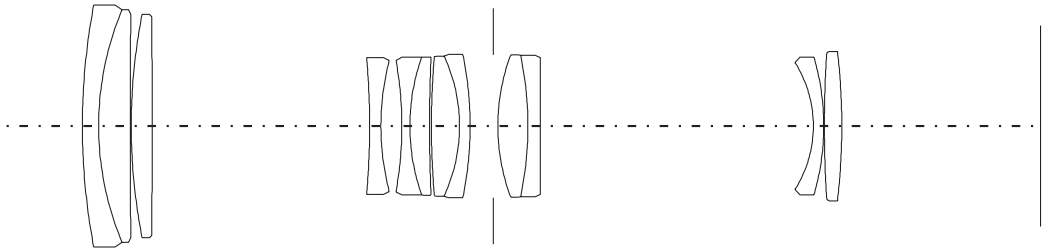
— Lens shape 180 mm





# LEICA VARIO-ELMAR-R 80-200 mm f/4

— Lens shape 200 mm





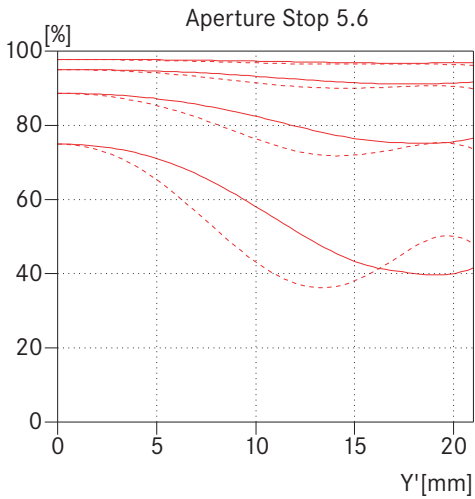
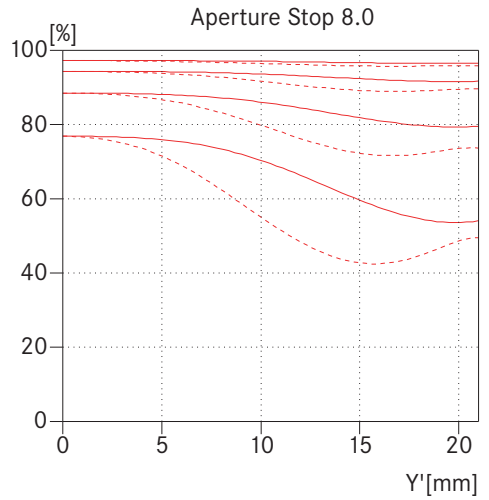
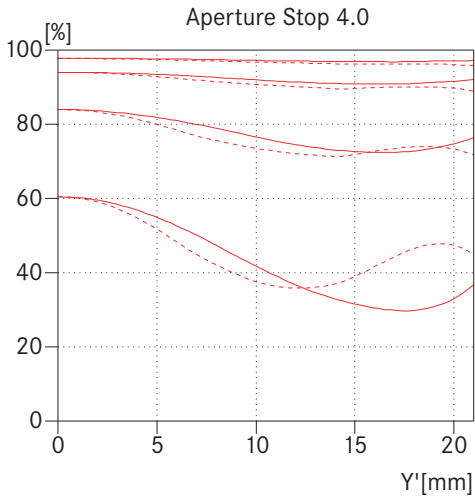
— Engineering drawing

### Technical Data

<b>Angle of view (diagonal, horizontal, vertical)</b>	At 80 mm focal length: 30°, 25°, 17°, at 200 mm focal length: 12.3°, 10.3°, 6.9°
<b>Optical design</b>	<b>Number of elements / groups:</b> 12 / 8 <b>Focusing range:</b> 1.1 m to infinity
<b>Distance setting</b>	<b>Scale:</b> Combined meter/feet-increments <b>Smallest object field:</b> 80 mm focal length: 222 x 333 mm, 200 mm focal length: 94 x 140 mm <b>Highest reproduction ratio:</b> 80 mm focal length: 1:9.3, 200 mm focal length: 1:3.9
<b>Diaphragm</b>	<b>Setting / Type:</b> Preset diaphragm with clickstops (including half values), Fully automatic diaphragm <b>Smallest aperture:</b> f/22
<b>Bayonet</b>	LEICA R quick-change bayonet for LEICA R3 to LEICA R9 with mechanical, and, for LEICA R8/R9, additional electronic exposure control
<b>Filter (type)</b>	Internal thread for screw-in type filters E 60
<b>Lens hood</b>	Built-in, telescopic
<b>Dimensions and weight</b>	<b>Length:</b> 165 mm <b>Largest diameter:</b> 71 mm <b>Weight:</b> approx. 1.020 g



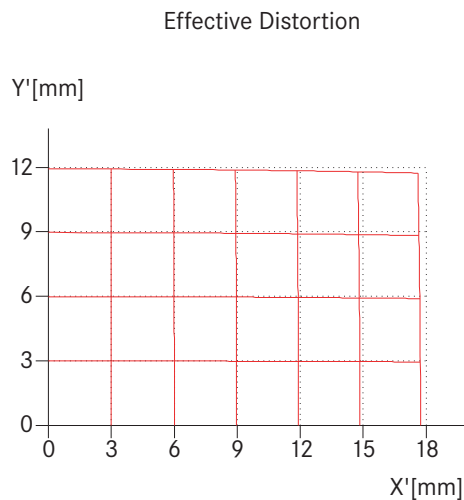
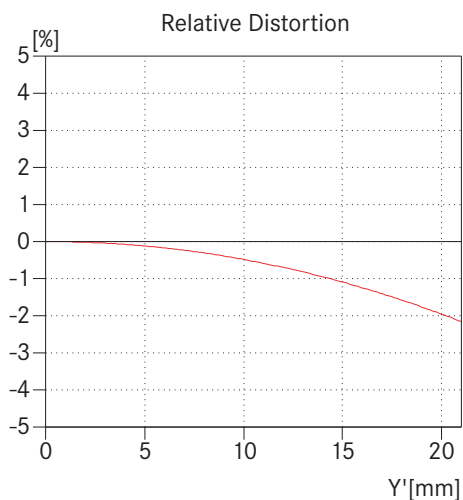
— MTF graphs 80 mm



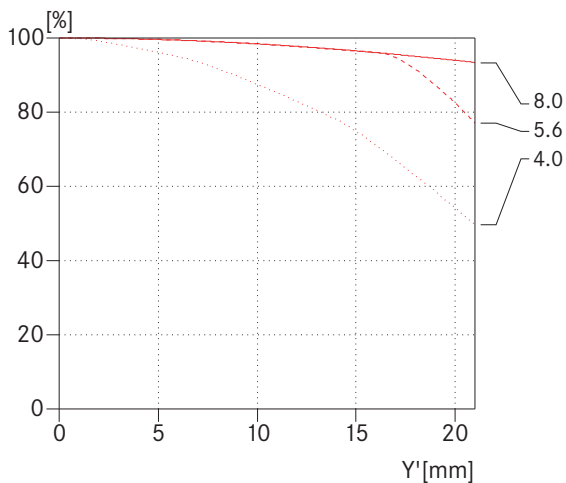
The MTF is indicated both at full aperture and at f/5.6 at long taking distances (infinity). Shown is the contrast in percentage for 5, 10, 20 and 40 lp/mm across the height of the 35 mm film format, for tangential (dotted line) and sagittal (solid line) structures, in white light. The 5 and 10 lp/mm 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 80 mm



— Vignetting 80 mm



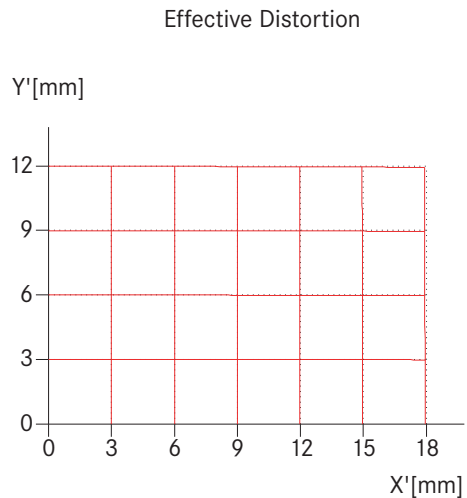
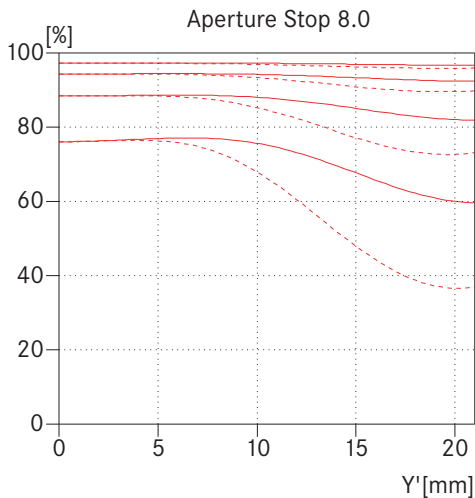
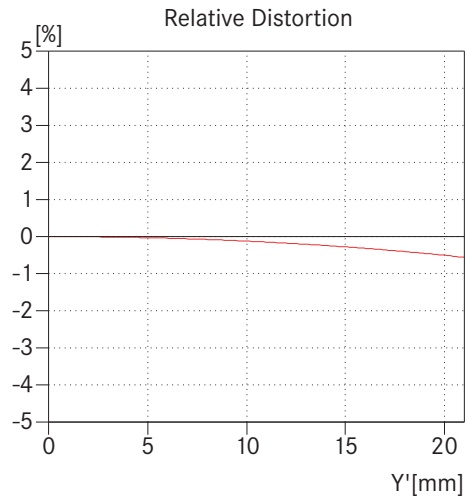
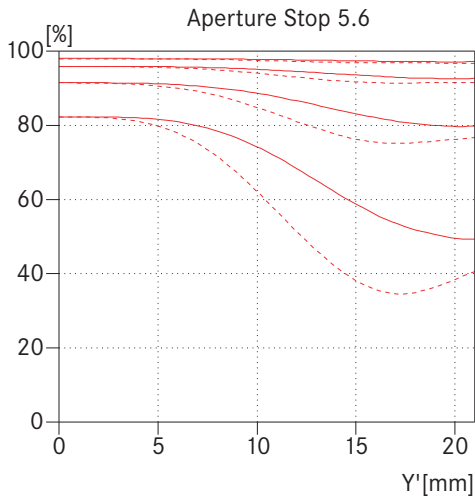
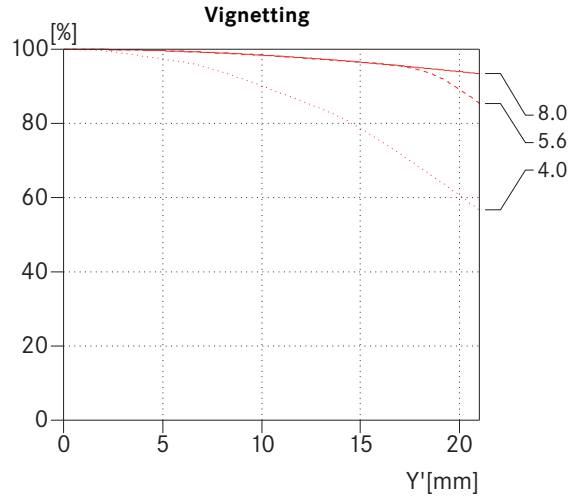
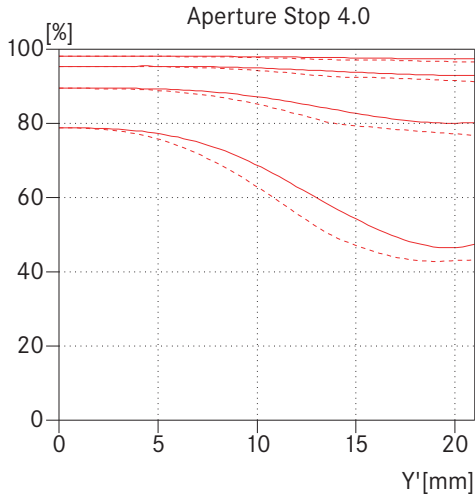
Distortion is the deviation of the real image height (in the picture) from the ideal image height. The relative distortion is the percentage deviation. The ideal image height results from the object height and the magnification. The image height of 21.6mm is the radial distance between the edge and the 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

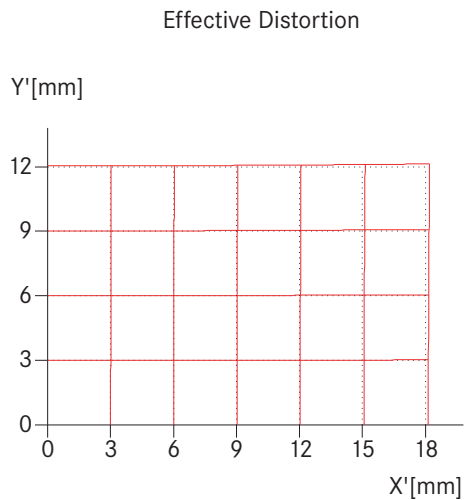
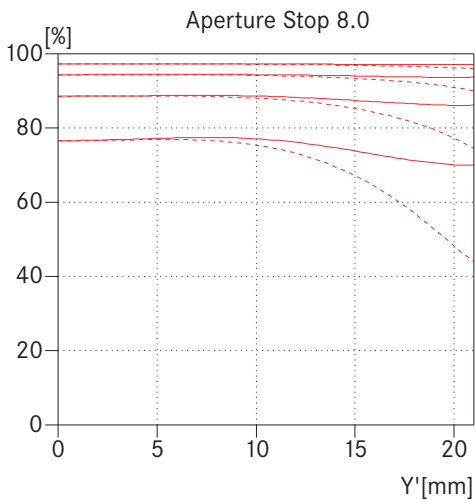
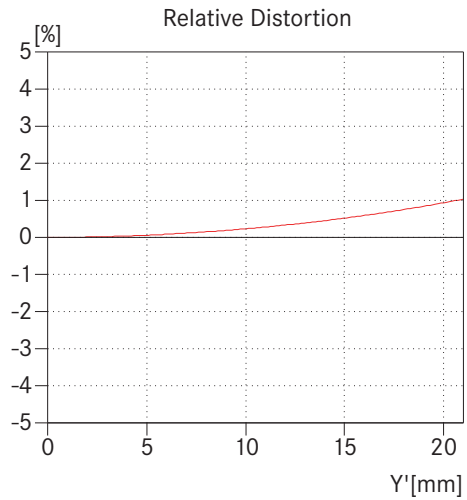
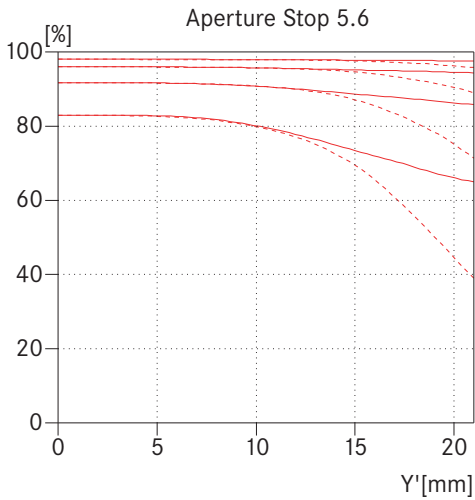
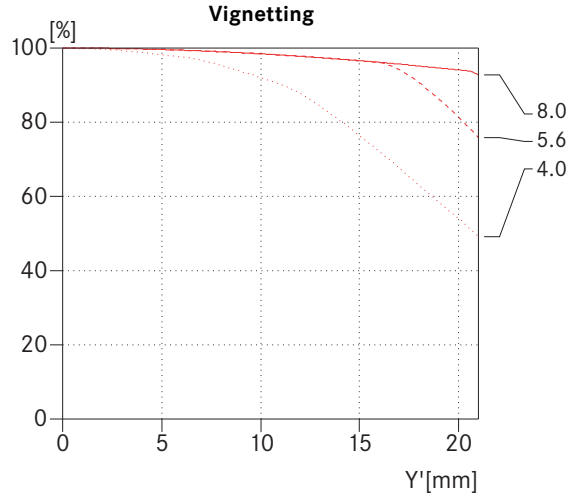
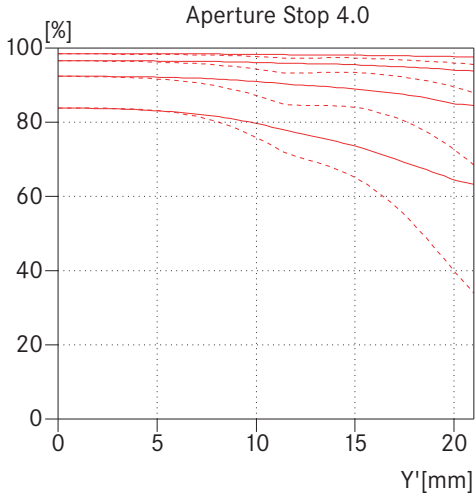


— 100 mm





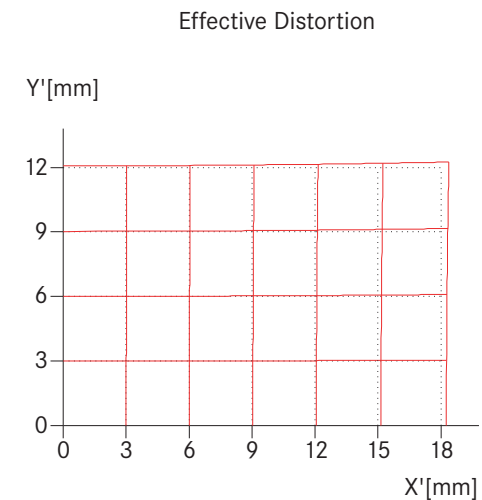
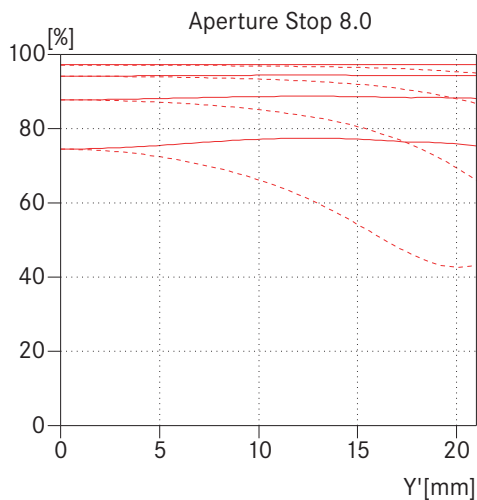
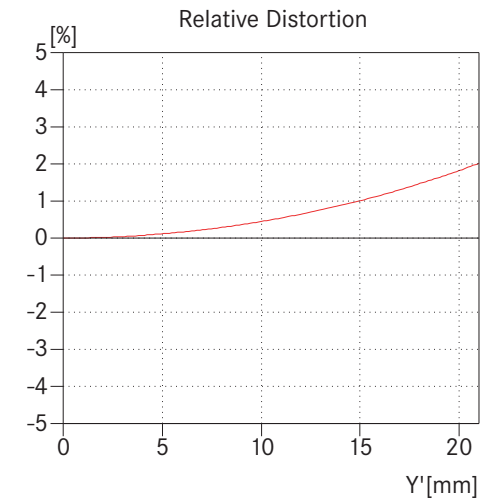
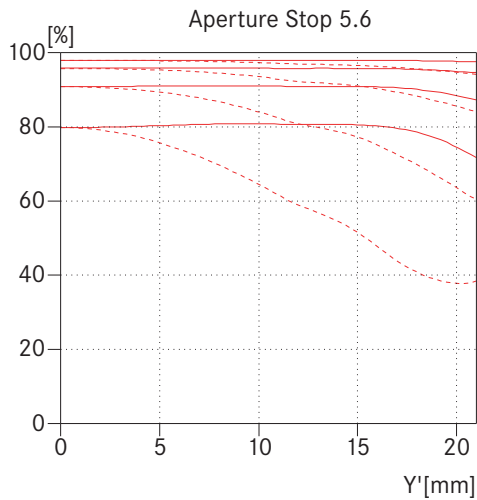
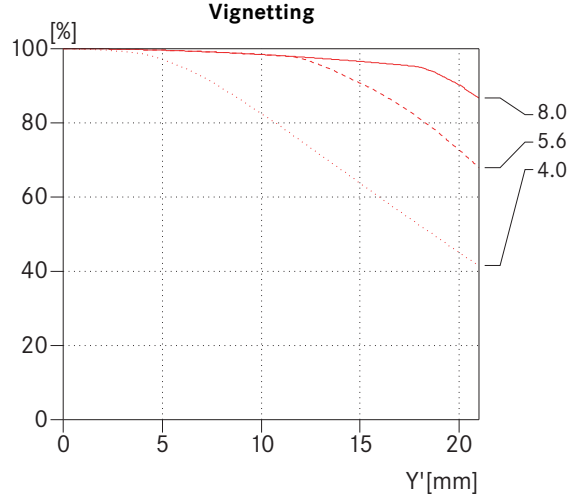
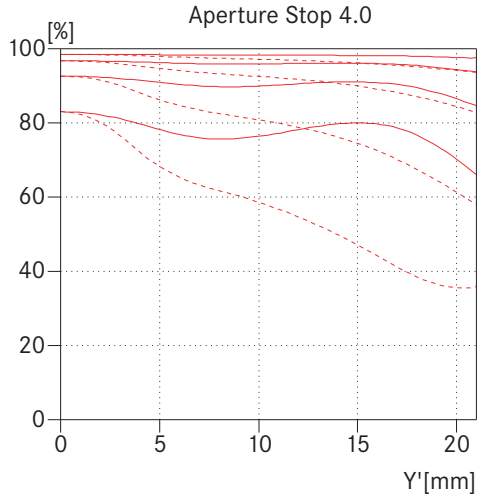
— 135 mm





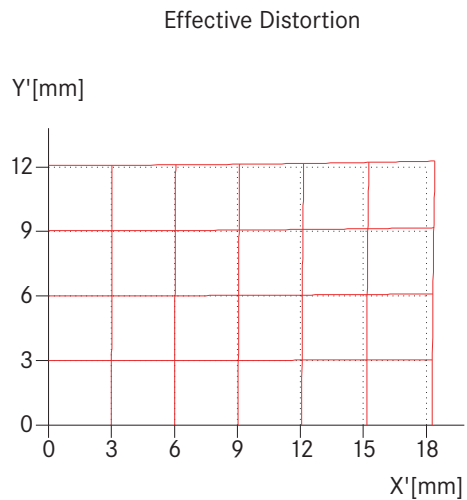
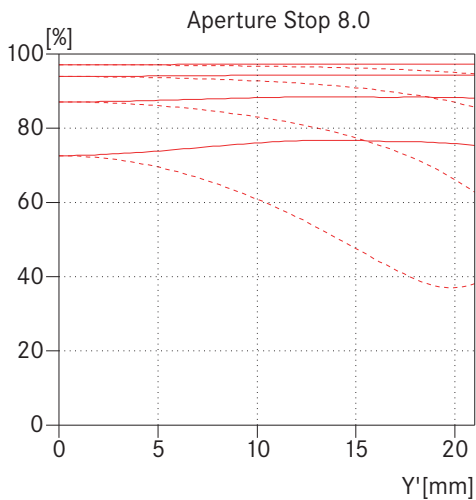
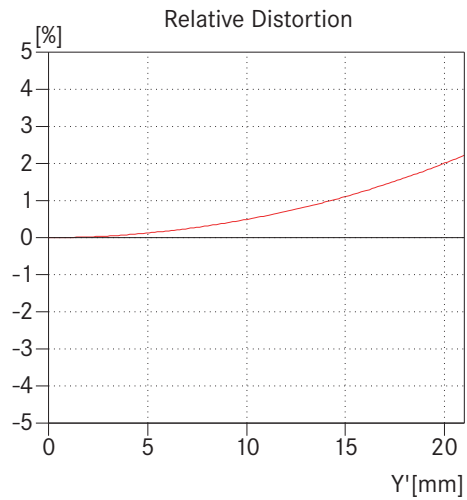
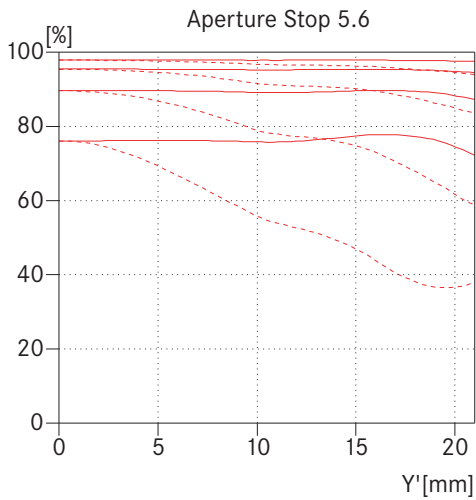
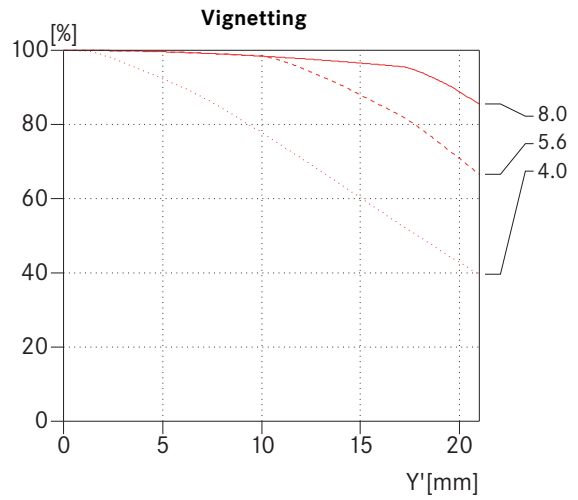
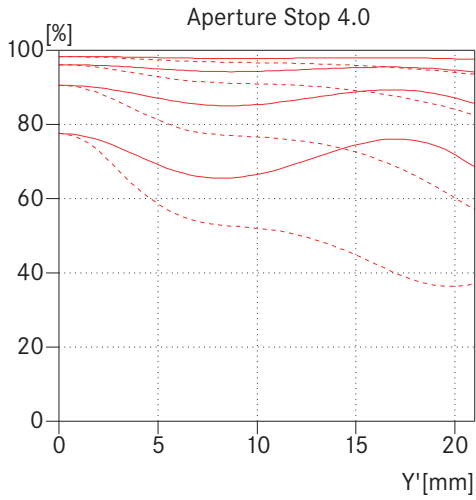


— 180 mm





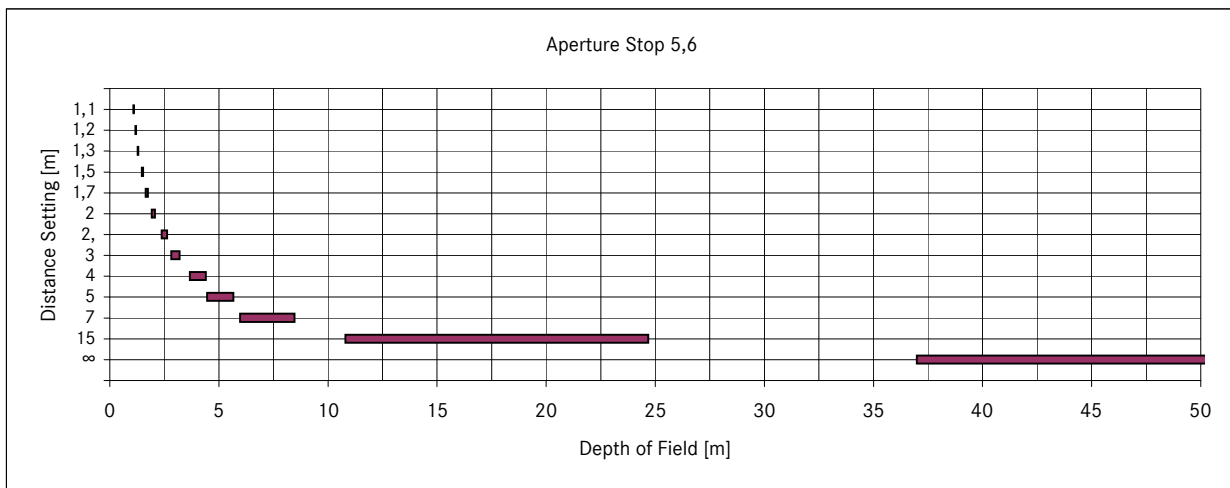
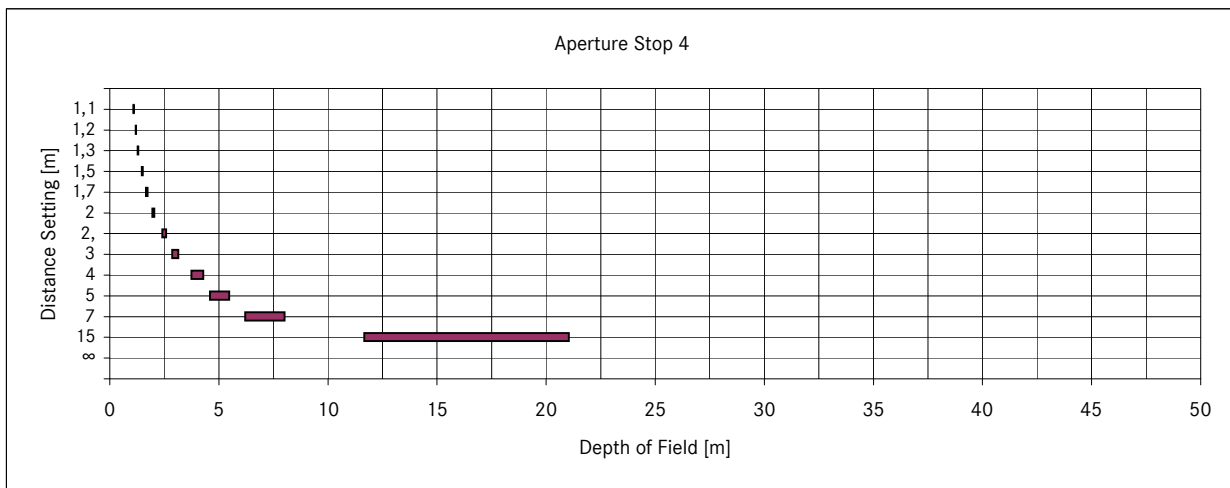
— 200 mm

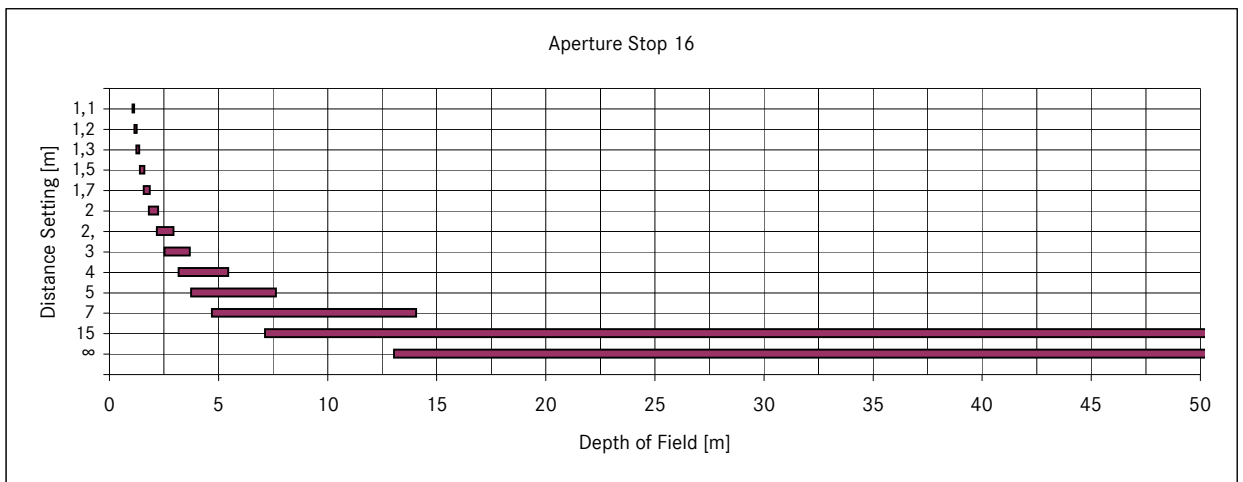
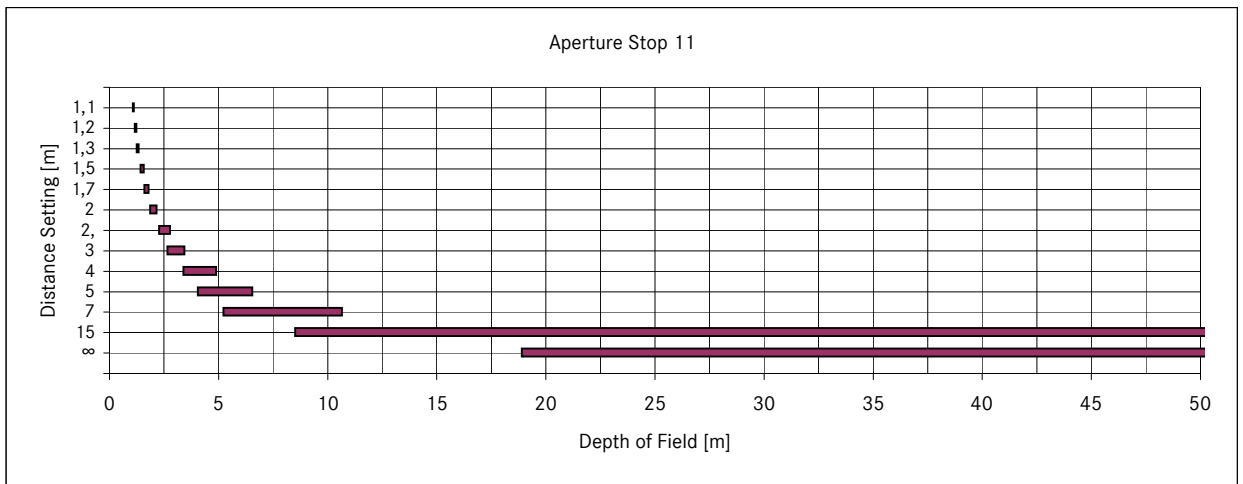
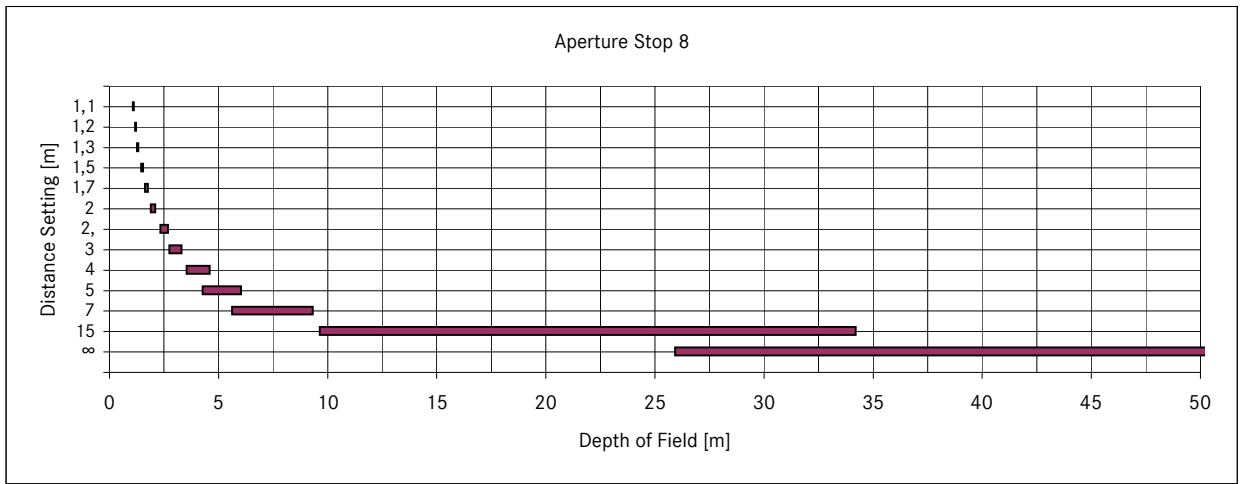


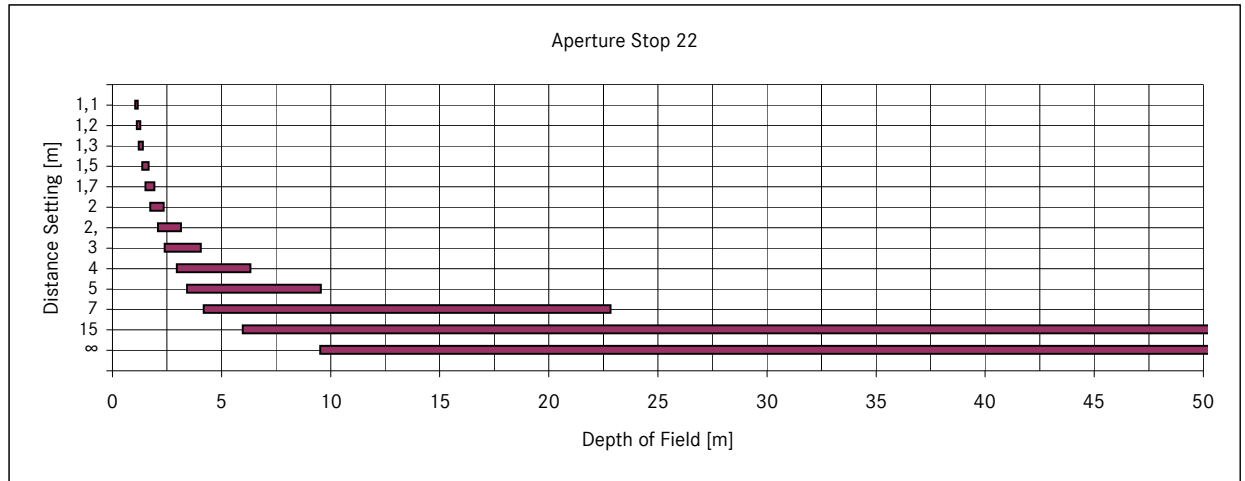


— Depth of field table 80 mm

	Aperture Stop						Magnification
	4	5,6	8	11	16	22	
1,1	1,088 - 1,112	1,084 - 1,117	1,077 - 1,125	1,068 - 1,134	1,054 - 1,150	1,038 - 1,170	1/9,0
1,2	1,185 - 1,216	1,179 - 1,222	1,170 - 1,231	1,160 - 1,244	1,142 - 1,265	1,122 - 1,291	1/10,2
1,3	1,281 - 1,320	1,274 - 1,327	1,263 - 1,339	1,250 - 1,354	1,229 - 1,381	1,204 - 1,414	1/11,5
1,5	1,472 - 1,529	1,463 - 1,540	1,447 - 1,557	1,428 - 1,580	1,398 - 1,619	1,364 - 1,670	1/13,9
1,7	1,662 - 1,739	1,649 - 1,754	1,628 - 1,779	1,603 - 1,810	1,563 - 1,866	1,518 - 1,938	1/16,4
2	1,945 - 2,059	1,925 - 2,081	1,895 - 2,118	1,859 - 2,166	1,802 - 2,252	1,738 - 2,365	1/20,1
2,5	2,408 - 2,600	2,376 - 2,638	2,327 - 2,703	2,269 - 2,788	2,178 - 2,943	2,079 - 3,156	1/26,1
3	2,862 - 3,152	2,816 - 3,212	2,744 - 3,312	2,659 - 3,448	2,530 - 3,701	2,391 - 4,062	1/32,2
4	3,746 - 4,293	3,662 - 4,410	3,534 - 4,614	3,387 - 4,898	3,169 - 5,461	2,943 - 6,342	1/44,4
5	4,597 - 5,483	4,467 - 5,68	4,273 - 6,038	4,053 - 6,552	3,735 - 7,64	3,416 - 9,565	1/56,5
7	6,210 - 8,03	5,966 - 8,48	5,613 - 9,33	5,227 - 10,67	4,693 - 14,07	4,183 - 22,85	1/80,8
15	11,66 - 21,06	10,80 - 24,69	9,644 - 34,22	8,513 - 66,36	7,128 - ∞	5,971 - ∞	1/178
∞	50,36 - ∞	36,99 - ∞	25,93 - ∞	18,90 - ∞	13,04 - ∞	9,53 - ∞	1/∞









— Depth of field table 100 mm

	Aperture Stop						Magnification
	4	5,6	8	11	16	22	
1,1	1,091 - 1,109	1,088 - 1,112	1,083 - 1,117	1,077 - 1,124	1,067 - 1,136	1,055 - 1,150	1/7,42
1,2	1,189 - 1,211	1,185 - 1,215	1,179 - 1,222	1,171 - 1,231	1,158 - 1,245	1,143 - 1,263	1/8,45
1,3	1,286 - 1,314	1,282 - 1,319	1,274 - 1,327	1,264 - 1,338	1,249 - 1,356	1,231 - 1,378	1/9,47
1,5	1,481 - 1,520	1,474 - 1,527	1,463 - 1,540	1,449 - 1,555	1,427 - 1,582	1,402 - 1,615	1/11,5
1,7	1,674 - 1,727	1,664 - 1,738	1,649 - 1,754	1,631 - 1,775	1,602 - 1,812	1,568 - 1,858	1/13,5
2	1,961 - 2,040	1,948 - 2,056	1,926 - 2,080	1,900 - 2,112	1,857 - 2,168	1,809 - 2,239	1/16,5
2,5	2,436 - 2,568	2,413 - 2,594	2,378 - 2,636	2,335 - 2,691	2,267 - 2,789	2,191 - 2,916	1/21,6
3	2,904 - 3,103	2,870 - 3,142	2,818 - 3,208	2,756 - 3,294	2,658 - 3,448	2,550 - 3,654	1/26,6
4	3,822 - 4,196	3,761 - 4,272	3,668 - 4,401	3,558 - 4,573	3,388 - 4,894	3,206 - 5,345	1/36,6
5	4,717 - 5,320	4,622 - 5,447	4,477 - 5,665	4,309 - 5,964	4,056 - 6,540	3,790 - 7,402	1/46,6
7	6,441 - 7,668	6,258 - 7,946	5,987 - 8,436	5,680 - 9,142	5,235 - 10,63	4,786 - 13,22	1/66,6
15	12,56 - 18,64	11,85 - 20,46	10,88 - 24,25	9,864 - 31,60	8,543 - 63,98	7,365 - ∞	1/147
∞	74,13 - ∞	54,34 - ∞	38,07 - ∞	27,73 - ∞	19,10 - ∞	13,93 - ∞	1/∞

