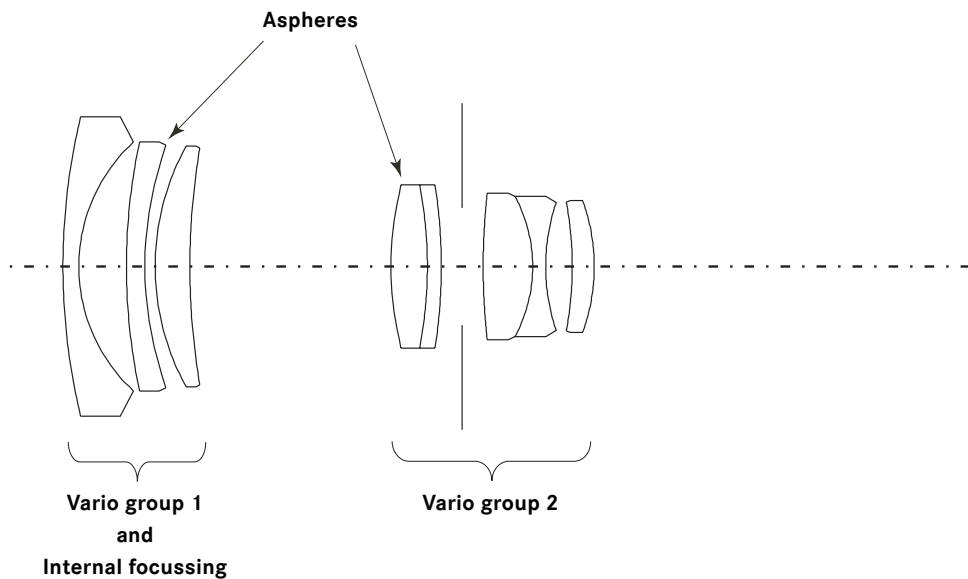




This lens combines three of the focal lengths that are most popular among Leica M photographers. The appropriate bright-line frame appears in the viewfinder when any of the focal lengths is selected. A complex optical design gives this lens extraordinary performance characteristics: Five of the eight lens elements are made of high-refraction optical glass, two of which have aspherical surfaces. Richness of contrast and detail resolution are superb at all three focal lengths. Curvature of field and vignetting are of no practical consequence. The versatility, compact design and ease of operation of this high-performance lens make it a natural for uncomplicated shots with professional quality. Adding a 90 mm telephoto lens to this extra light Leica M traveling outfit makes it complete and ready for every imaging situation.

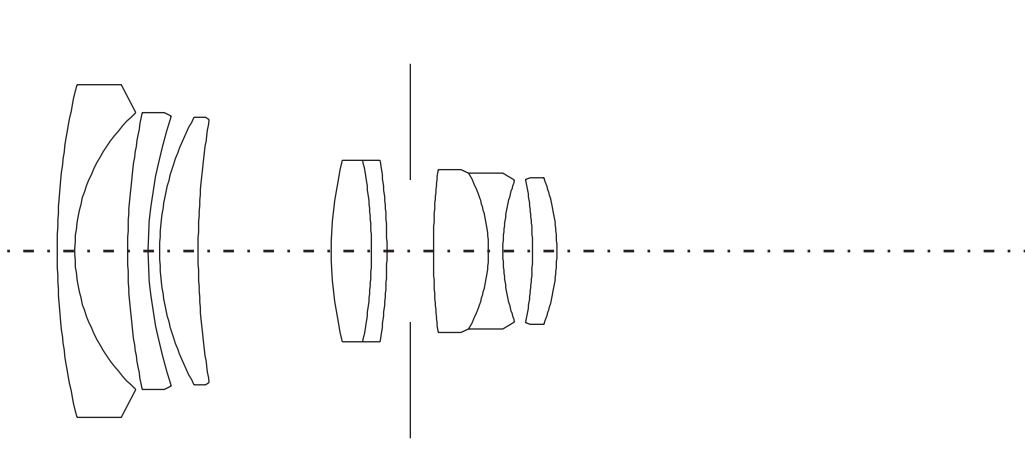
— Lens shape 28 mm



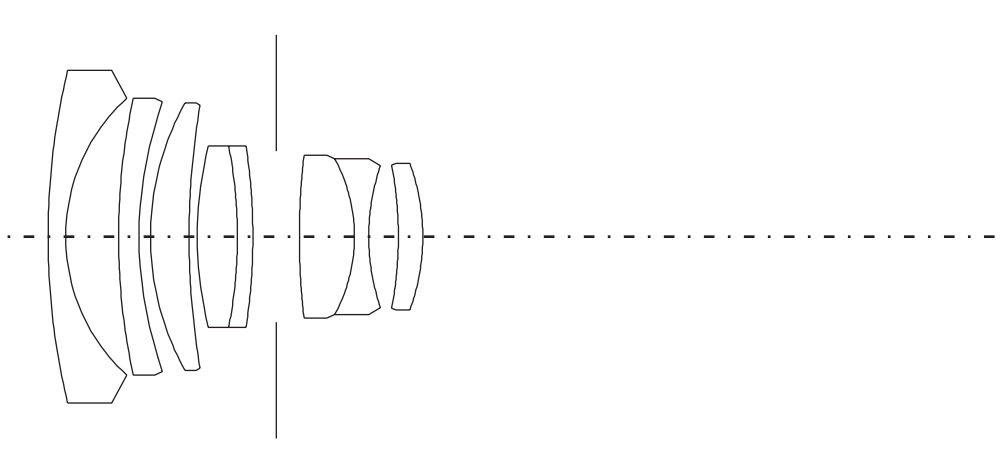


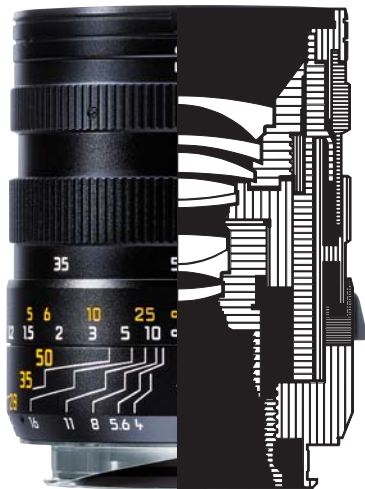
LEICA TRI-ELMAR-M 28-35-50 mm f/4 ASPH.

— Lens shape 35 mm



— Lens shape 50 mm





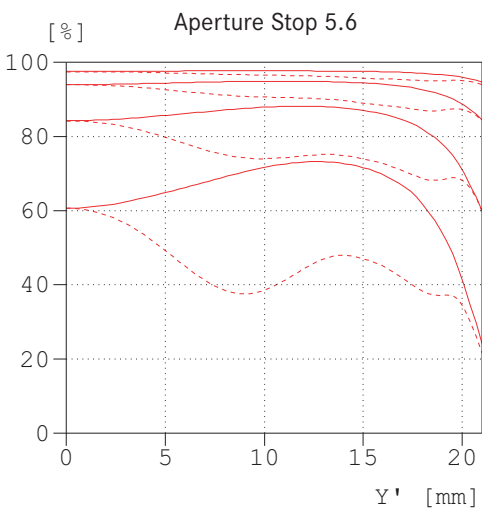
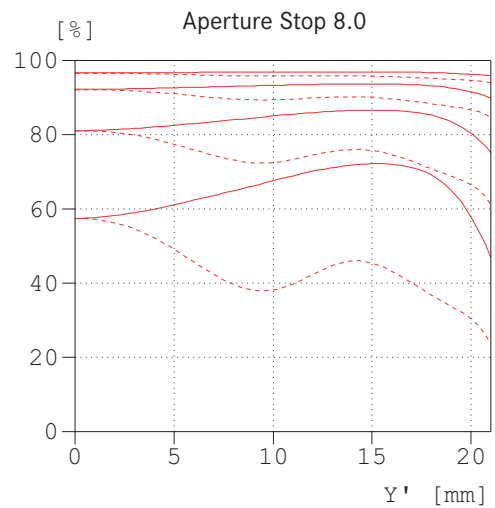
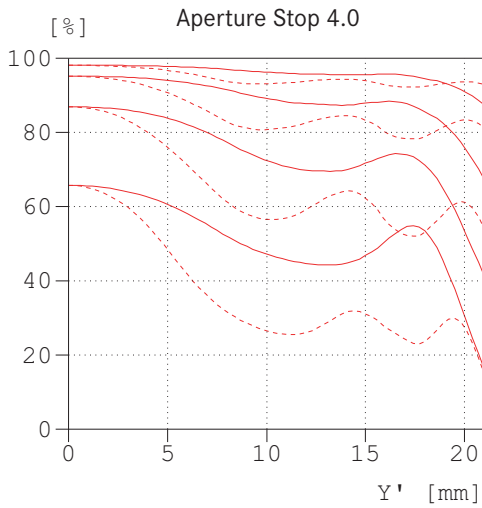
— Engineering drawing

Technical Data

Angle of view (diagonal, horizontal, vertical)	Focal length 28 mm: 75°, 65°, 46° Focal length 35 mm: 63°, 54°, 38° Focal length 50 mm: 47°, 40°, 27°
Optical design	Number of elements / groups: 8 / 6
Distance setting	Focusing range: 1m to Infinity Scale: combined meter/feet-increments Smallest object field: Focal length 28 mm: 750 x 1130 mm Focal length 35 mm: 620 x 930 mm Focal length 50 mm: 430 x 650 mm Highest reproduction ratio: Focal length 28 mm: 1:31 Focal length 35 mm: 1:26 Focal length 50 mm: 1:18
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 49
Lens hood	separate, available as accessory, clip-on type, lockable
Dimensions and weight	Length: 67.8 mm Largest diameter: 55 mm Weight: approx. 340 g



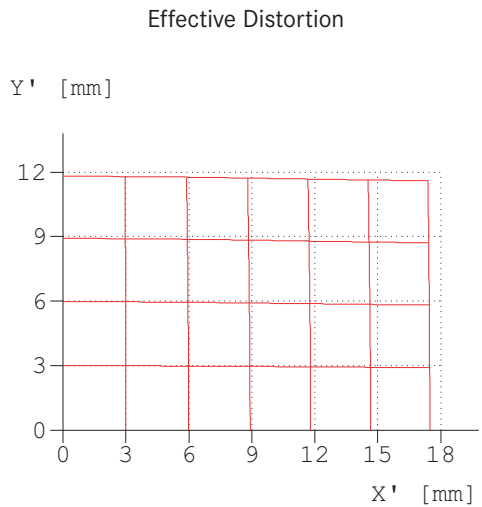
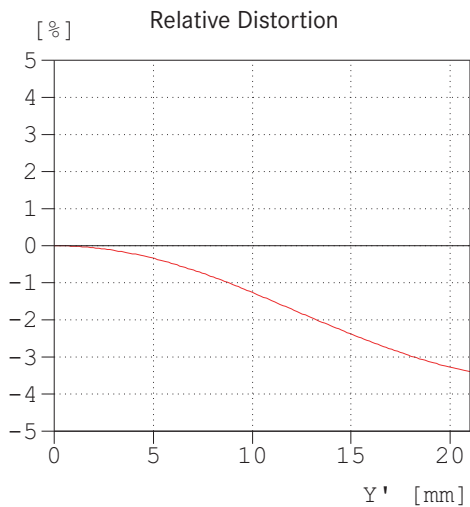
— MTF graphs 28 mm



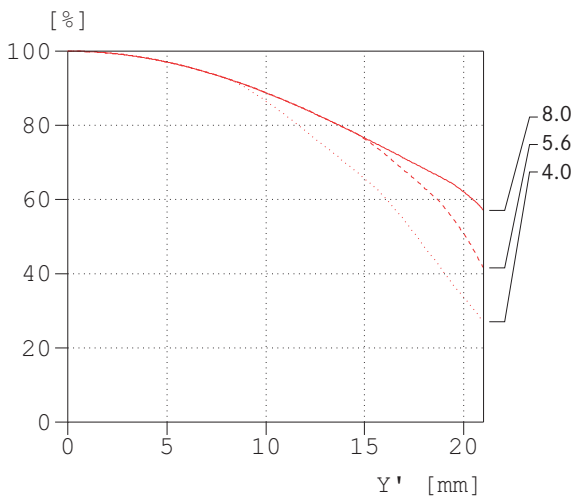
The MTF is indicated both at full aperture and at f/5.6 at long taking distances (infinity). Shown is the contrast in percentage for 5, 10, 20 and 40 lp/mm across the height of the 35 mm film format, for tangential (dotted line) and sagittal (solid line) structures, in white light. The 5 and 10 lp/mm 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 28 mm



— Vignetting 28 mm



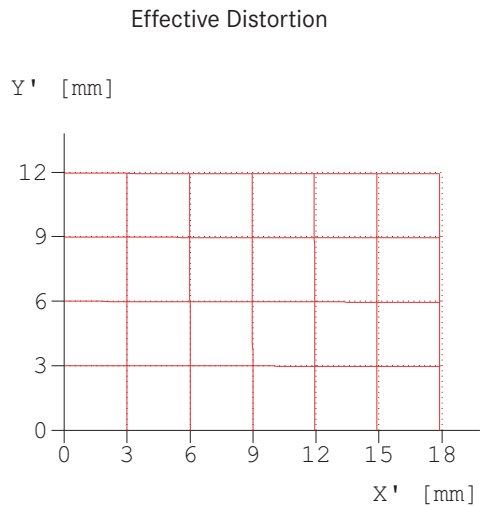
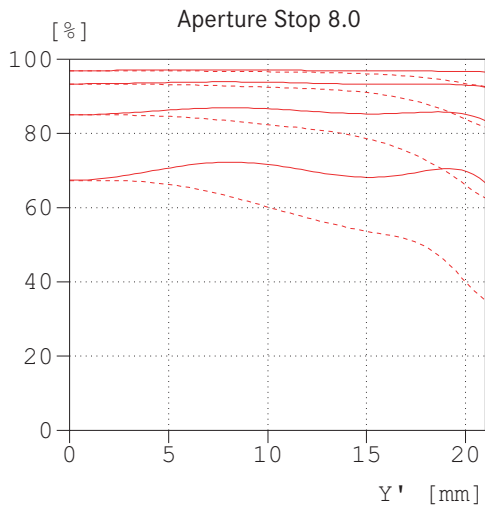
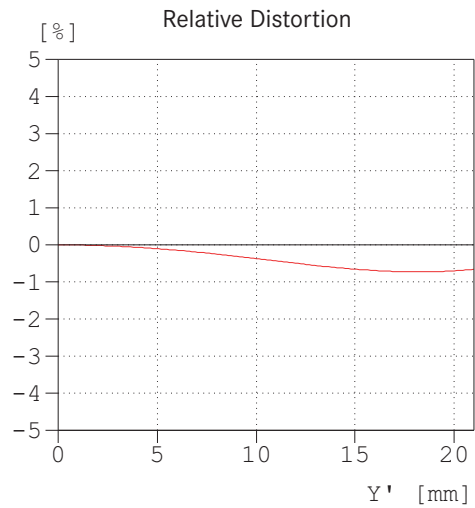
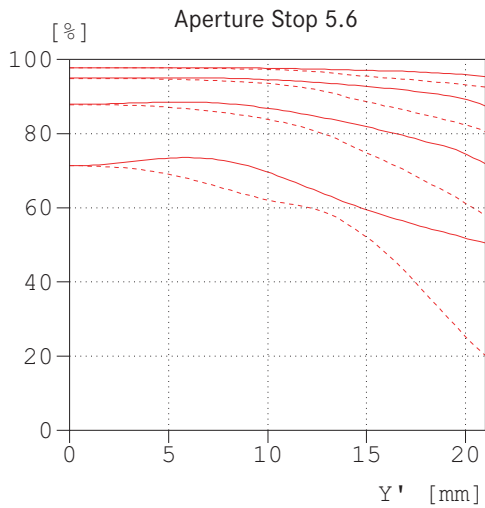
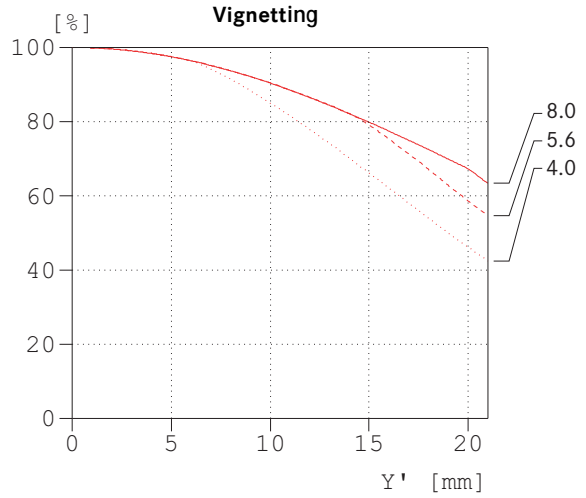
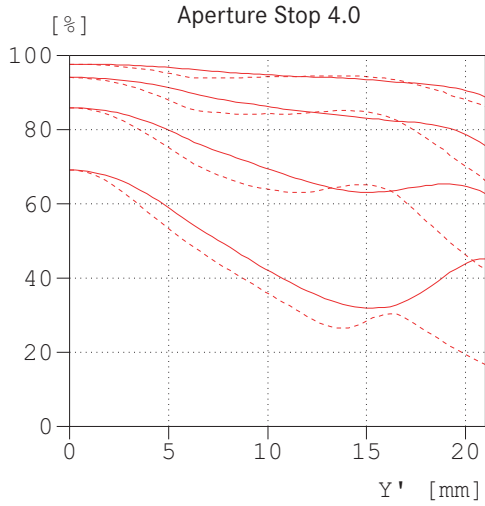
Distortion is the deviation of the real image height (in the picture) from the ideal image height. The relative distortion is the percentage deviation. The ideal image height results from the object height and the magnification. The image height of 21.6mm is the radial distance between the edge and the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

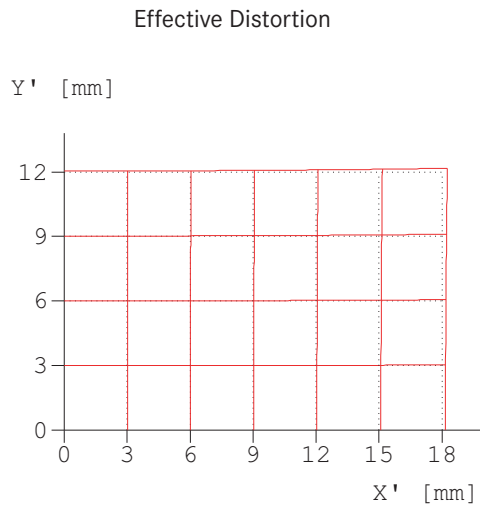
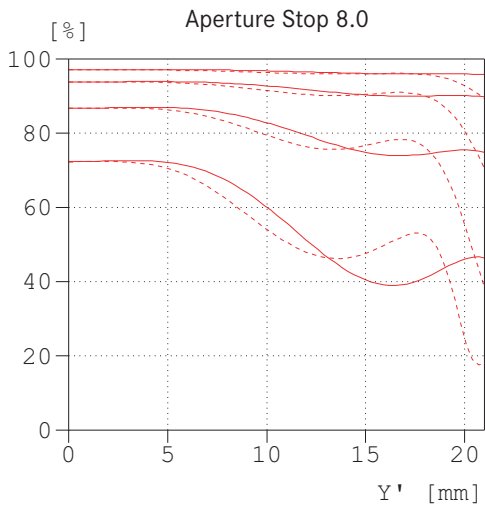
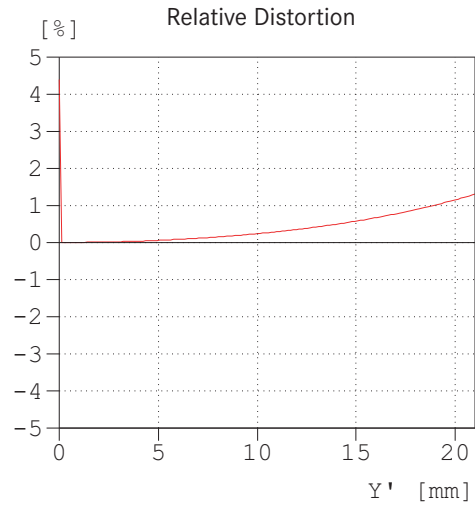
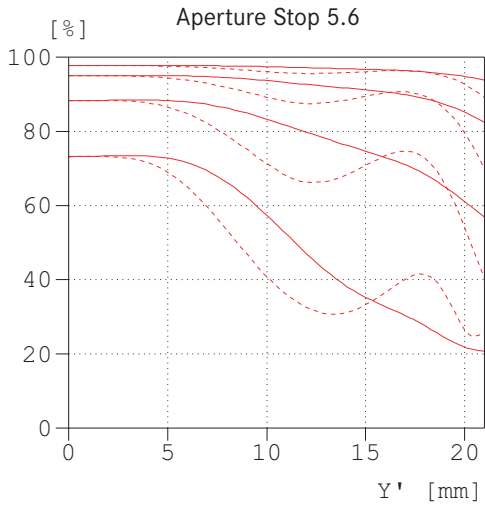
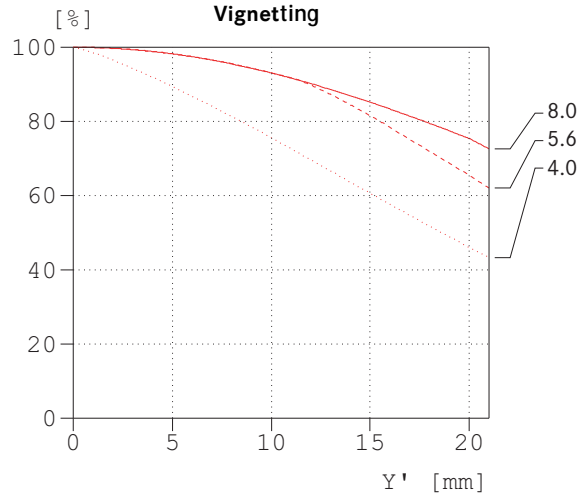
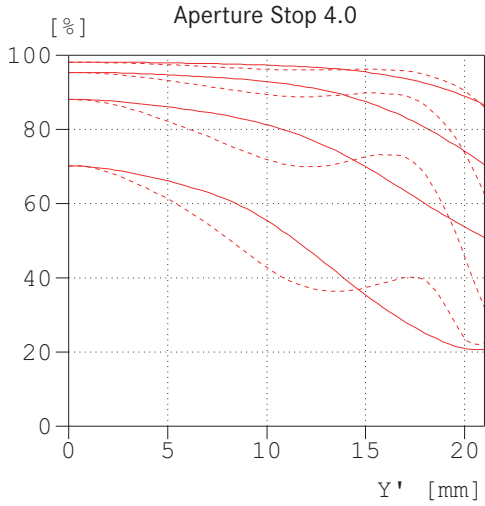


— 35 mm





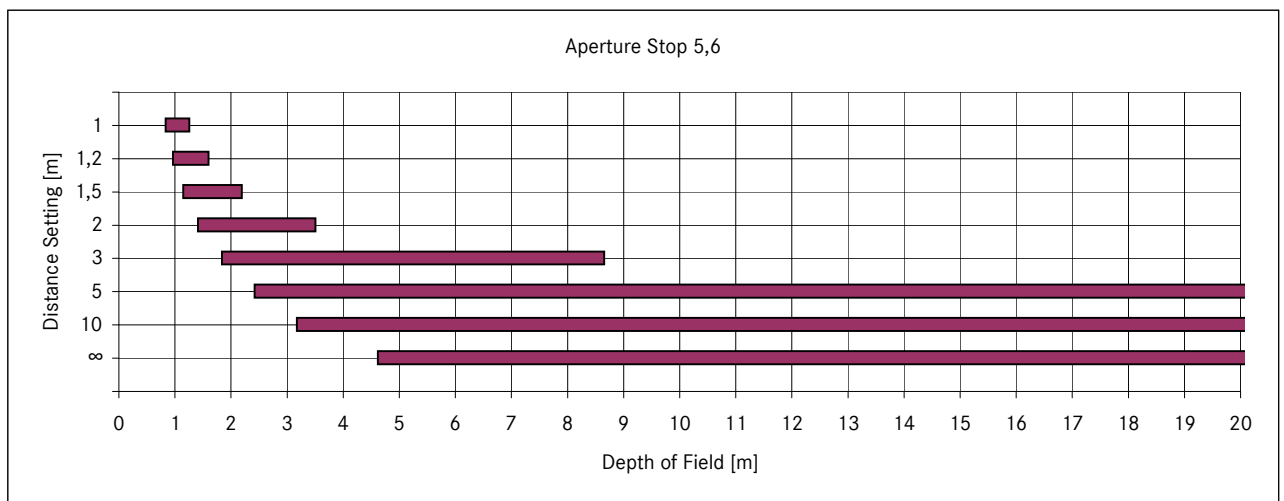
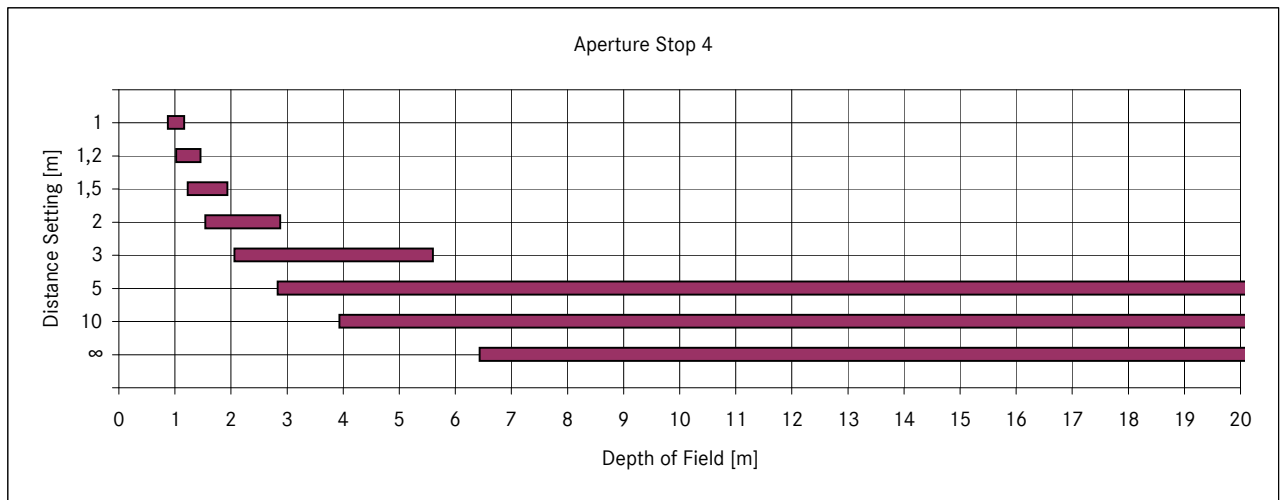
— 50 mm

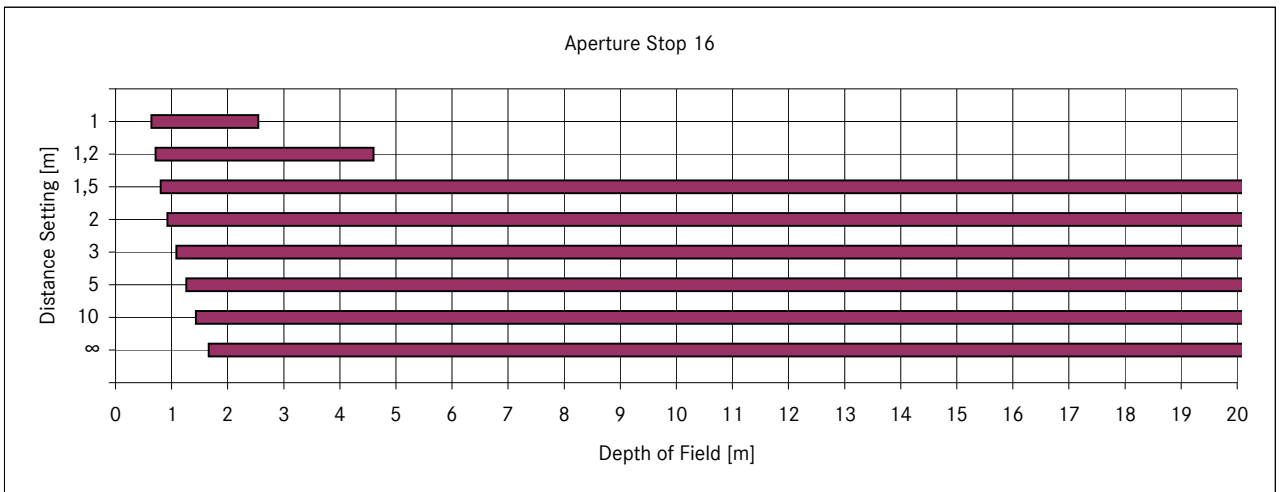
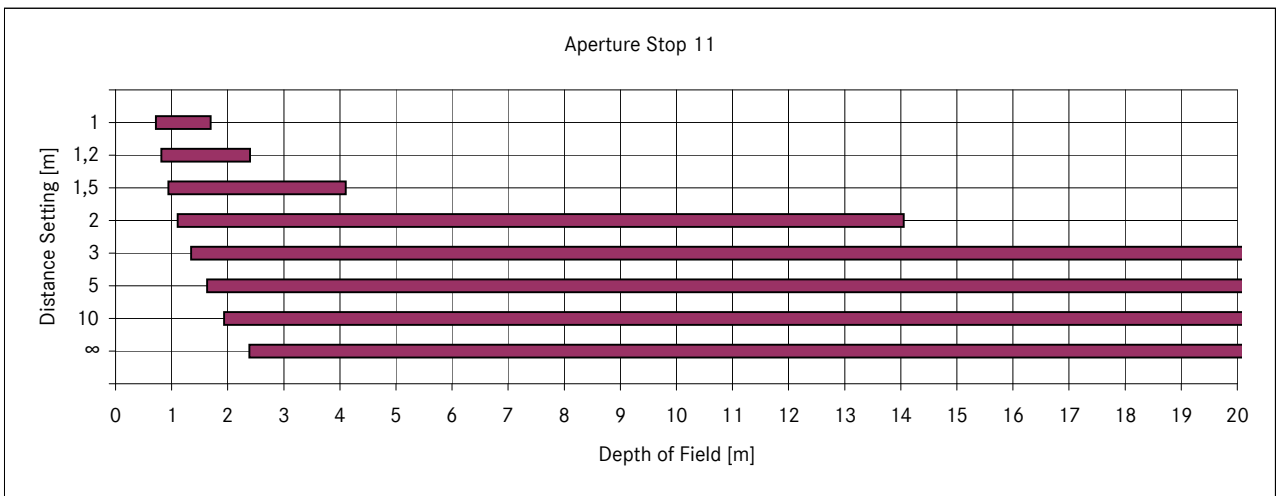
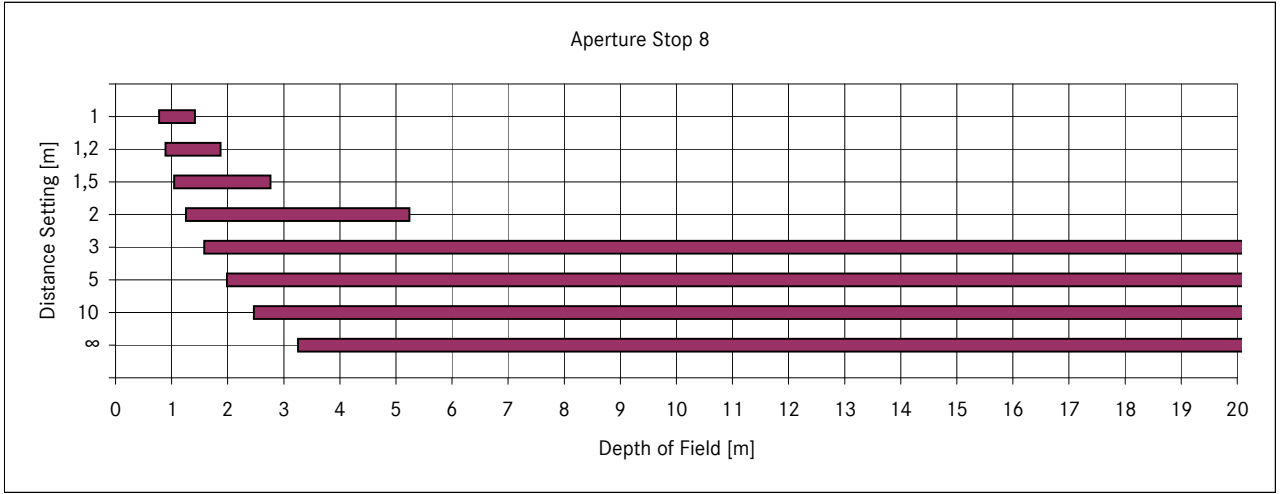


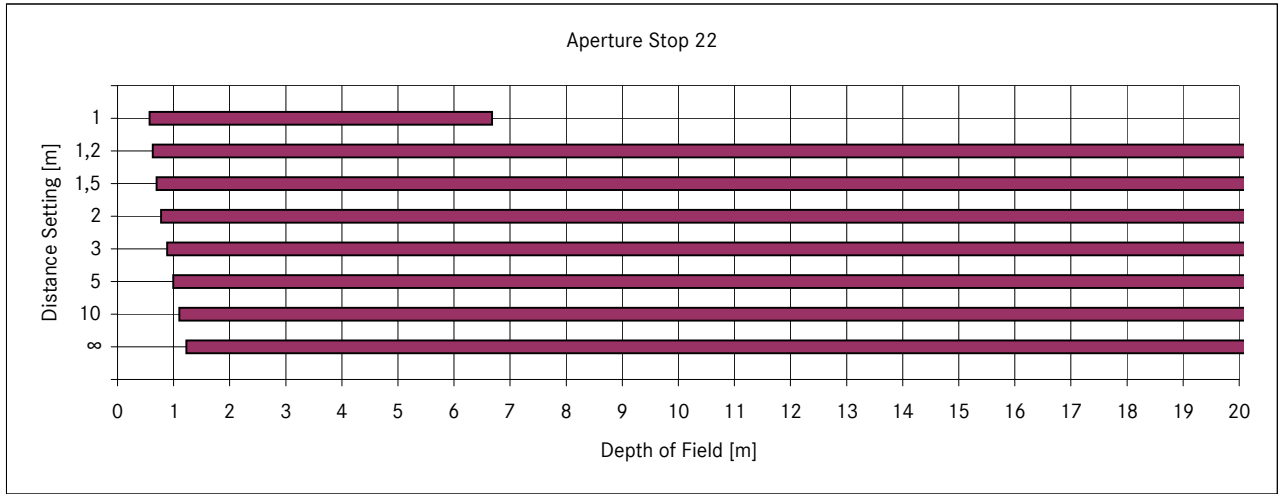


— Depth of field table 28 mm

	Aperture Stop						Magnification
	4,0	5,6	8	11	16	22	
1	0,874 - 1,172	0,833 - 1,260	0,779 - 1,422	0,721 - 1,700	0,642 - 2,549	0,570 - 6,683	1/32,9
1,2	1,021 - 1,461	0,965 - 1,603	0,892 - 1,879	0,815 - 2,405	0,715 - 4,606	0,626 - ∞	1/39,8
1,5	1,228 - 1,939	1,146 - 2,200	1,043 - 2,767	0,939 - 4,109	0,807 - 23,77	0,694 - ∞	1/50,1
2	1,539 - 2,882	1,411 - 3,509	1,256 - 5,243	1,106 - 14,06	0,926 - ∞	0,778 - ∞	1/67,4
3	2,062 - 5,607	1,836 - 8,656	1,579 - 49,80	1,347 - ∞	1,086 - ∞	0,886 - ∞	1/102
5	2,831 - 23,01	2,419 - ∞	1,988 - ∞	1,630 - ∞	1,260 - ∞	0,996 - ∞	1/171
10	3,932 - ∞	3,174 - ∞	2,468 - ∞	1,936 - ∞	1,433 - ∞	1,099 - ∞	1/343
∞	6,435 - ∞	4,619 - ∞	3,253 - ∞	2,384 - ∞	1,661 - ∞	1,226 - ∞	1/∞



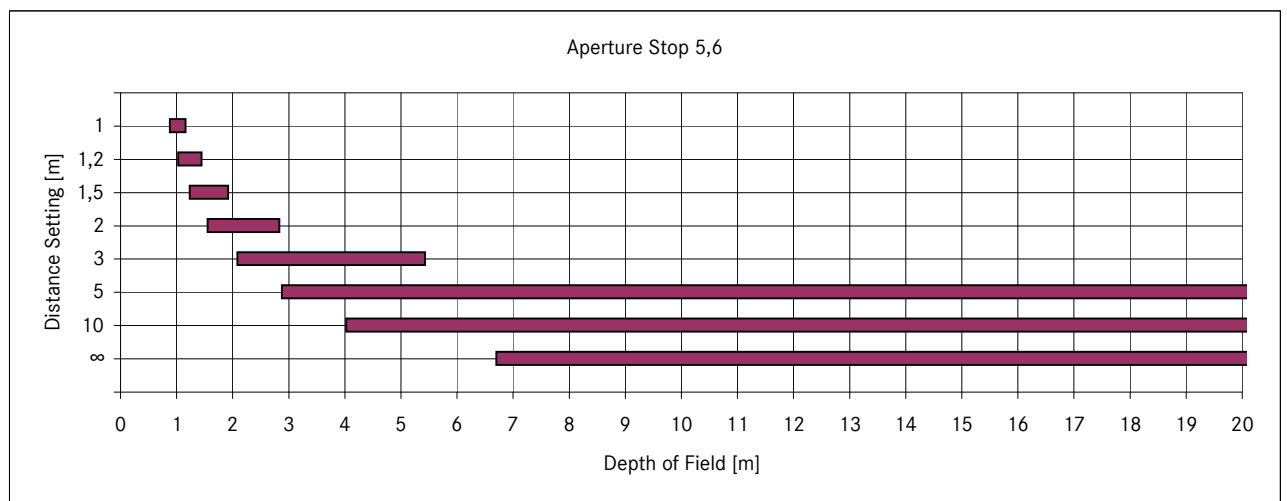
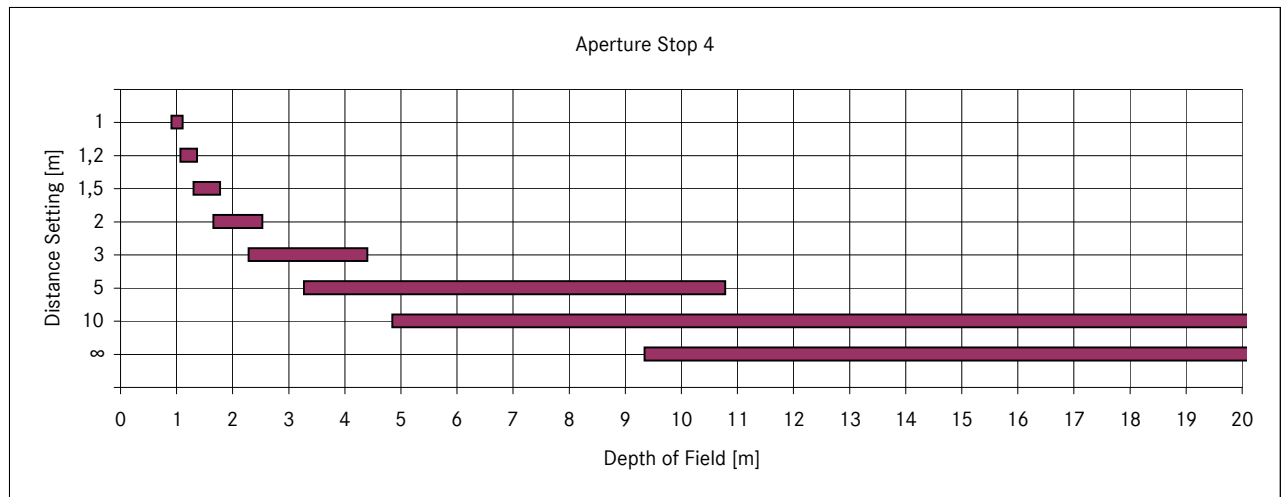


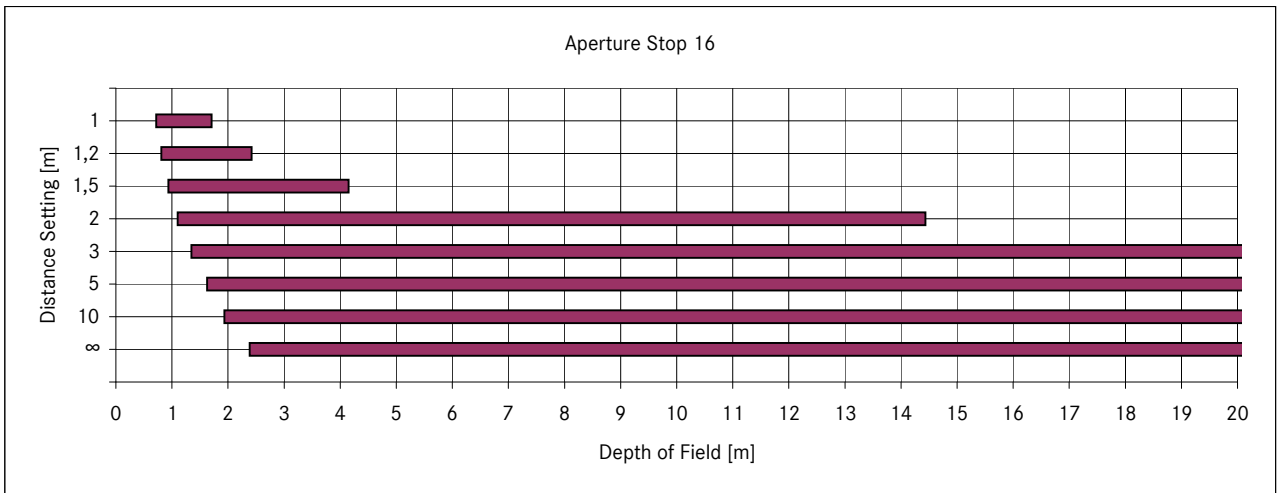
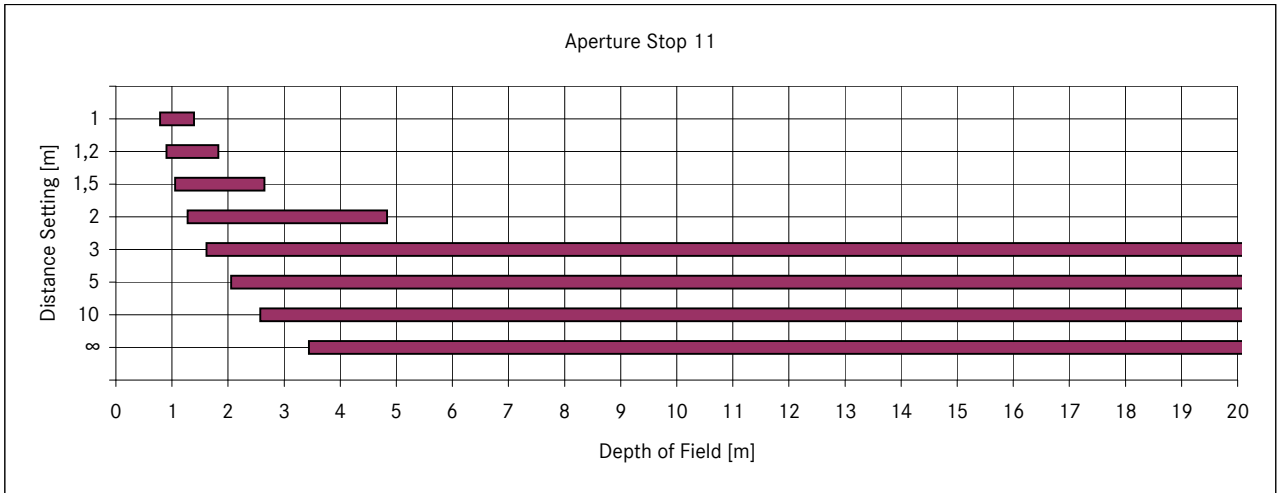
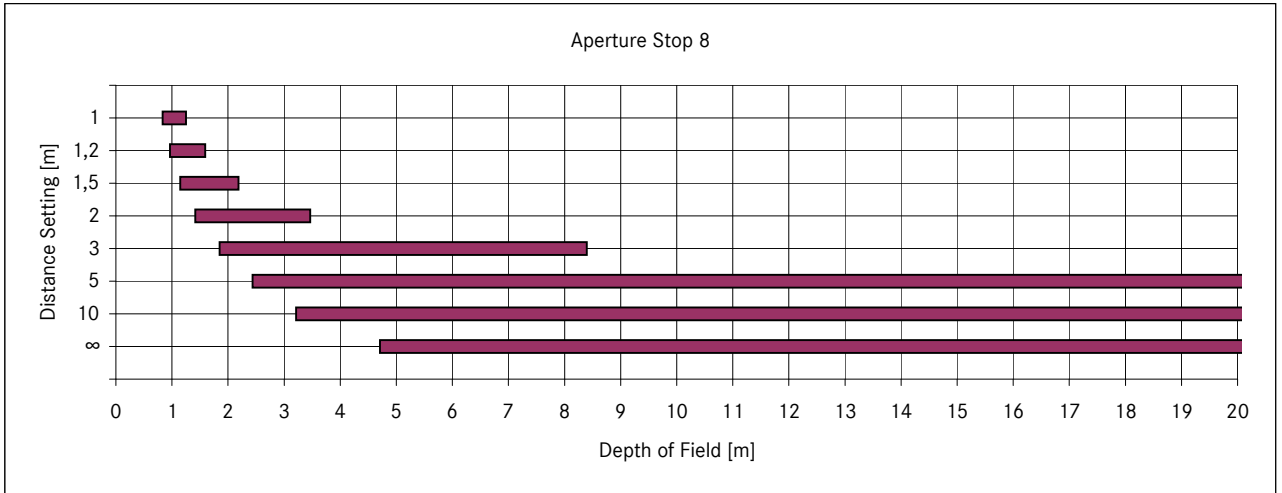




Depth of field table 35 mm

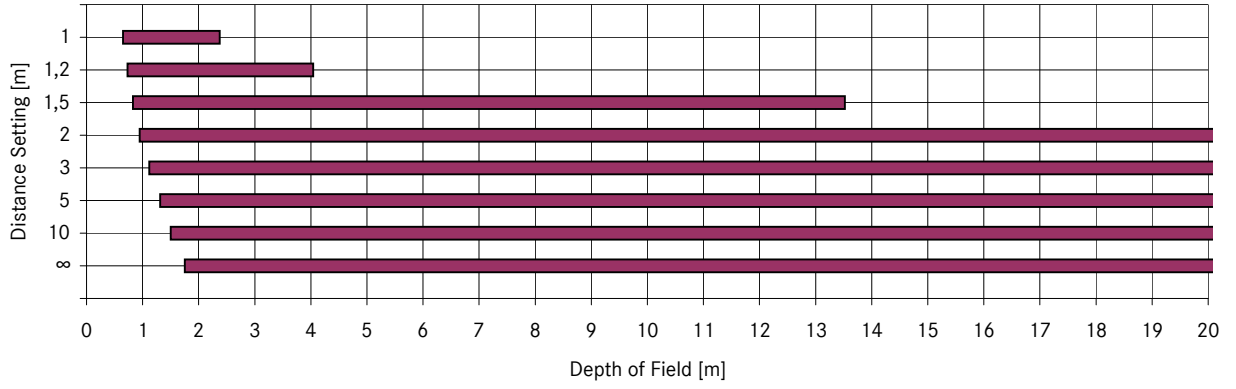
Distance Setting [m]	Aperture Stop						Magnification
	4	5,6	8	11	16	22	
1	0,909 - 1,113	0,877 - 1,167	0,834 - 1,258	0,786 - 1,396	0,718 - 1,714	0,652 - 2,378	1/27,3
1,2	1,070 - 1,369	1,026 - 1,452	0,967 - 1,598	0,902 - 1,830	0,813 - 2,427	0,728 - 4,046	1/33,1
1,5	1,300 - 1,778	1,235 - 1,921	1,149 - 2,189	1,058 - 2,656	0,936 - 4,157	0,825 - 13,53	1/41,6
2	1,656 - 2,534	1,551 - 2,839	1,417 - 3,473	1,279 - 4,84	1,104 - 14,44	0,950 - ∞	1/55,9
3	2,282 - 4,408	2,085 - 5,435	1,847 - 8,402	1,618 - 27,09	1,345 - ∞	1,121 - ∞	1/84,5
5	3,270 - 10,79	2,878 - 20,24	2,440 - ∞	2,053 - ∞	1,629 - ∞	1,310 - ∞	1/142
10	4,844 - ∞	4,025 - ∞	3,214 - ∞	2,572 - ∞	1,936 - ∞	1,500 - ∞	1/285
∞	9,343 - ∞	6,699 - ∞	4,709 - ∞	3,443 - ∞	2,388 - ∞	1,755 - ∞	1/∞







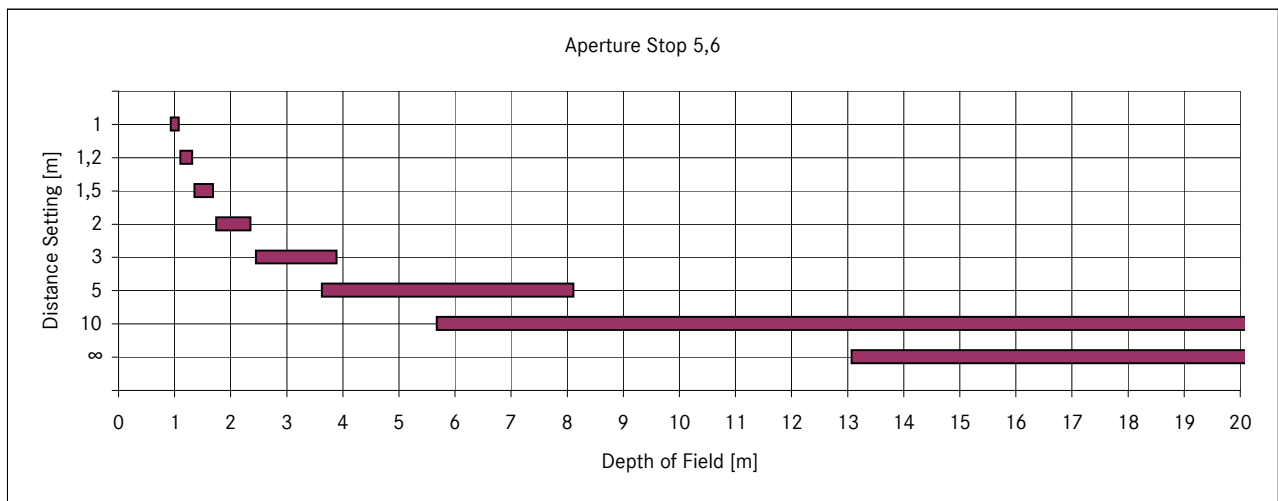
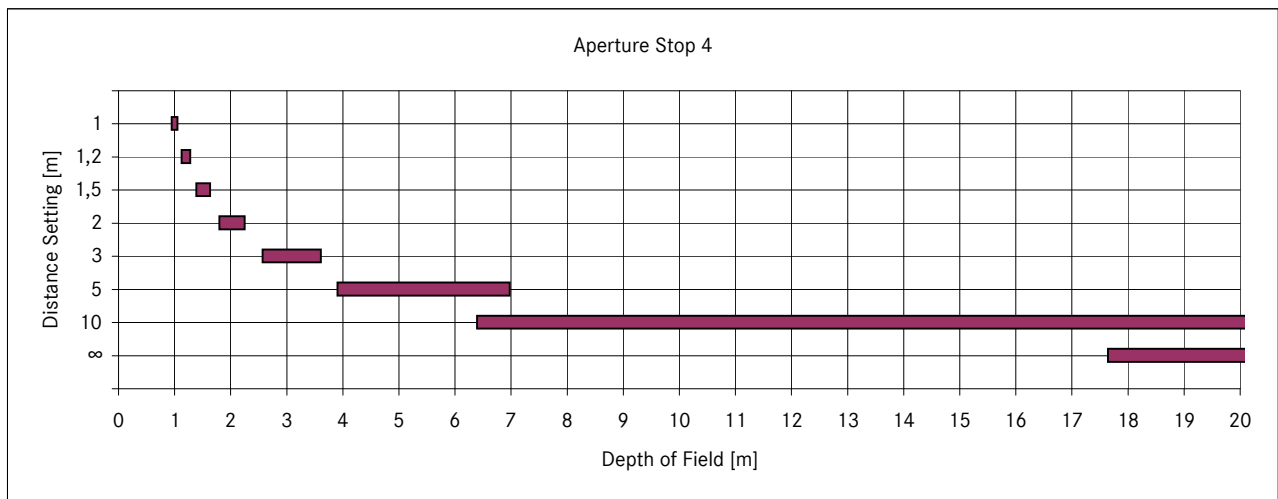
Aperture Stop 22

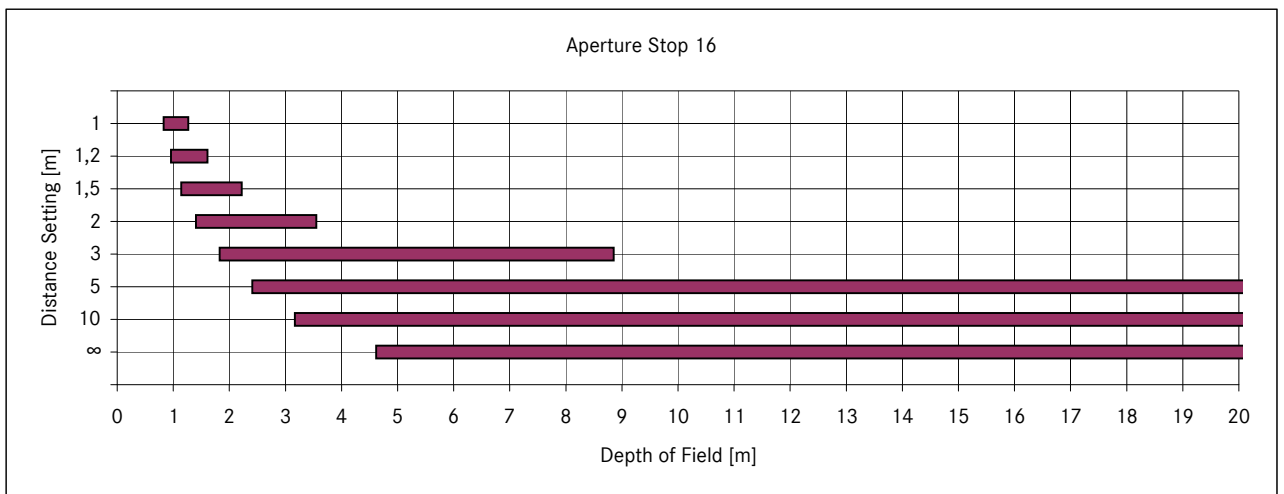
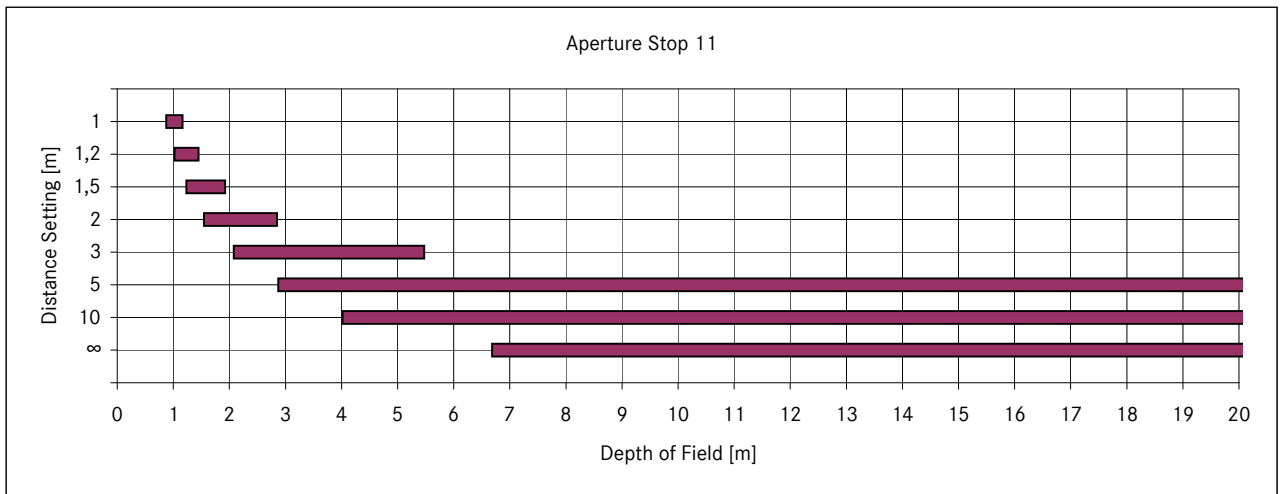
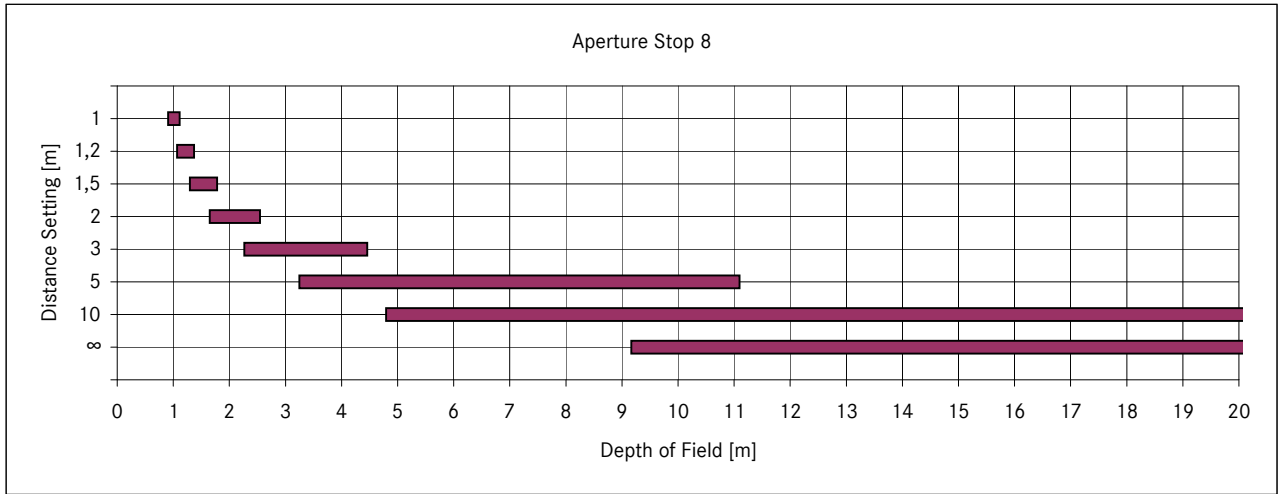




Depth of field table 50 mm

Distance Setting [m]	Aperture Stop						Magnification
	4	5,6	8	11	16	22	
1	0,949 - 1,058	0,932 - 1,080	0,906 - 1,118	0,875 - 1,171	0,829 - 1,272	0,780 - 1,420	1/19,6
1,2	1,126 - 1,285	1,102 - 1,318	1,066 - 1,376	1,023 - 1,458	0,960 - 1,618	0,894 - 1,868	1/23,7
1,5	1,385 - 1,636	1,350 - 1,691	1,294 - 1,789	1,232 - 1,930	1,140 - 2,225	1,048 - 2,731	1/29,8
2	1,800 - 2,252	1,739 - 2,357	1,648 - 2,554	1,547 - 2,855	1,405 - 3,557	1,266 - 5,071	1/40,0
3	2,569 - 3,611	2,446 - 3,891	2,268 - 4,464	2,080 - 5,478	1,829 - 8,858	1,599 - 35,28	1/60,4
5	3,903 - 6,979	3,624 - 8,114	3,245 - 11,10	2,871 - 20,67	2,411 - ∞	2,026 - ∞	1/101
10	6,391 - 23,22	5,675 - 43,59	4,793 - ∞	4,017 - ∞	3,168 - ∞	2,533 - ∞	1/203
∞	17,64 - ∞	13,07 - ∞	9,166 - ∞	6,685 - ∞	4,618 - ∞	3,378 - ∞	1/∞







Aperture Stop 22

