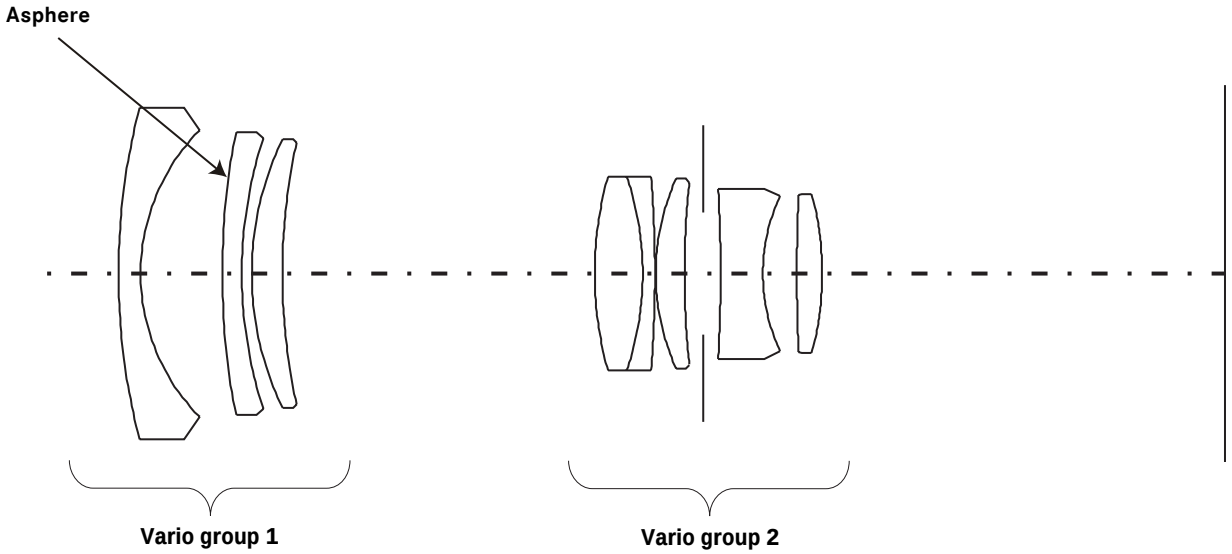
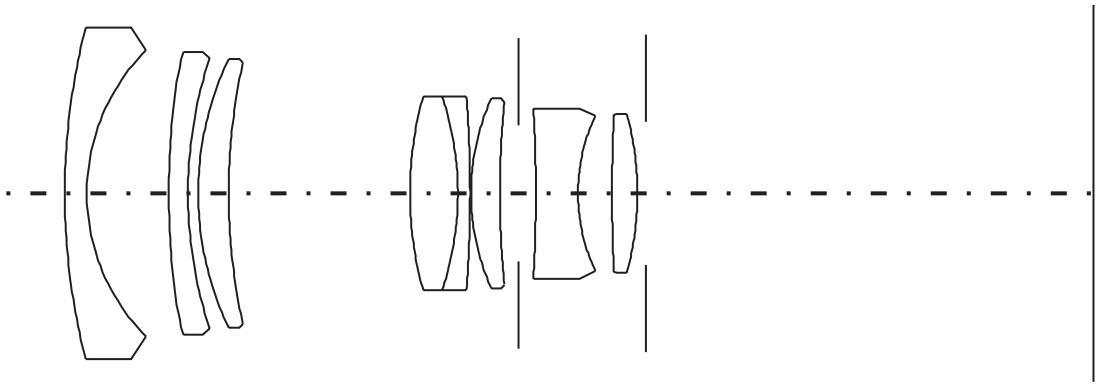
With the use of one lens element with an aspherical surface, contrast and imaging quality of this lens are at least as good as those of lenses with comparable fixed focal lengths. With its excellent gradation in shadow areas and highlights, it is particularly well suited for subjects with strong light contrasts. Thanks to a macro setting, close-up pictures as near as 26 cm (10.5 inches) are possible, which corresponds to a reproduction ratio of 1:2.8. As a universal zoom lens, it covers the classic focal lengths. All these qualities make it an indispensable standard lens in the Leica R system.

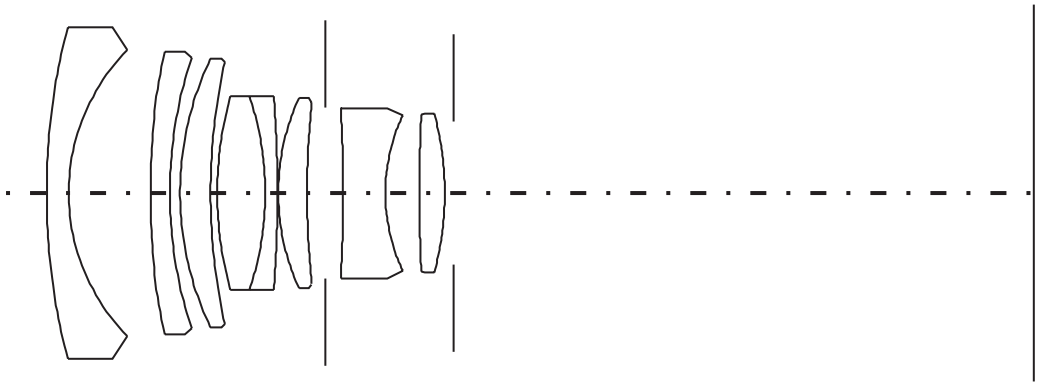
Lens shape 35 mm



Lens shape 50 mm



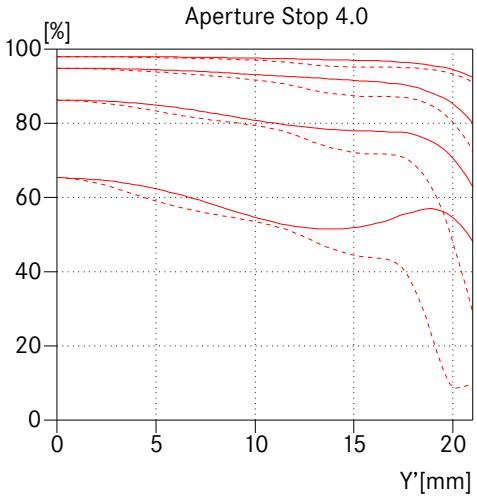
Lens shape 70 mm

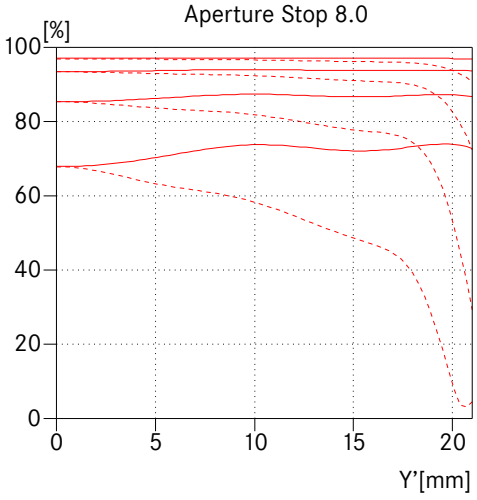


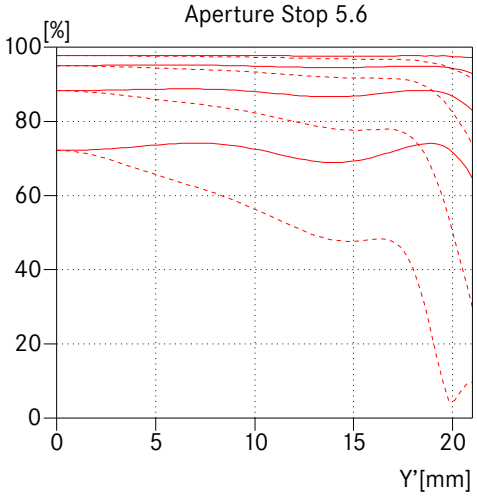
Engineering drawing

Technical Data	
Angle of view (diagonal, horizontal, vertical)	At 35 mm focal length: 63°, 54°, 38°, at 70 mm focal length: 34°, 29°, 19°
Optical design	**Number of elements / groups:** 8 / 7 **Focusing range:** 0.5 m to Infinity, in macro-position 0.26 m
Distance setting	**Scale:** Combined meter/feet-increments **Smallest object field:** 28 mm focal length: 350 x 525 mm, at 70 mm focal length: 192 x 288 mm, in macro-position: 67 x 101 mm **Highest reproduction ratio:** 28 mm focal length: 1:14.6, 70 mm focal length: 1:8, in macro-position: 1:2.8
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)	Internal thread for screw-in type filters E 60
Lens hood	Separate, screw-in type, also attachable in reverse position
Dimensions and weight	**Length:** ca. 79 mm **Largest diameter:** ca. 74 mm **Weight:** ca. 505 g

MTF graphs 35 mm





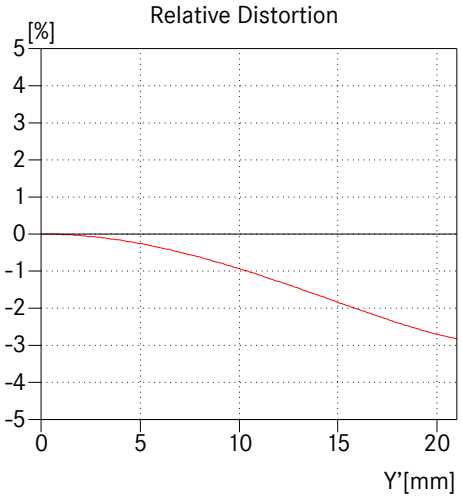


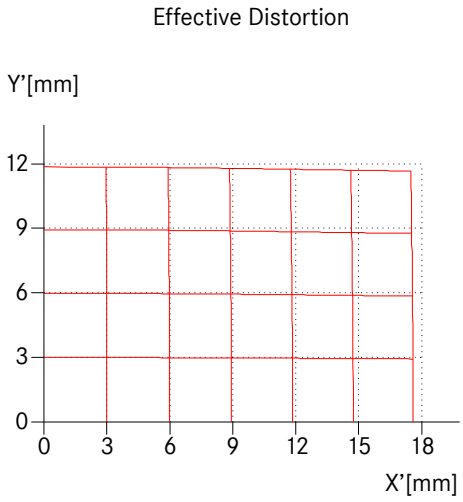
The MTF is indicated both at full aperture and at f/5.6 at long taking distances (infinity). Shown is the contrast in percentage for 5, 10, 20 and 40 lp/mm accross the height of the 35 mm film format, for tangential (dotted line) and sagittal (solid line) structures, in white light. The 5 and 10 lp/mm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

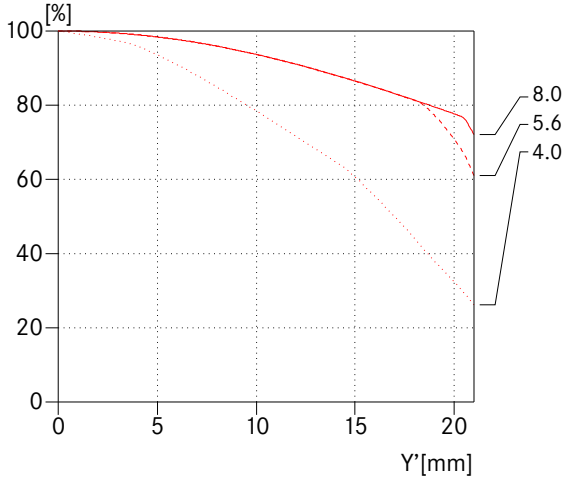
tangential structures

Distortion 35 mm





Vignetting 35 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.

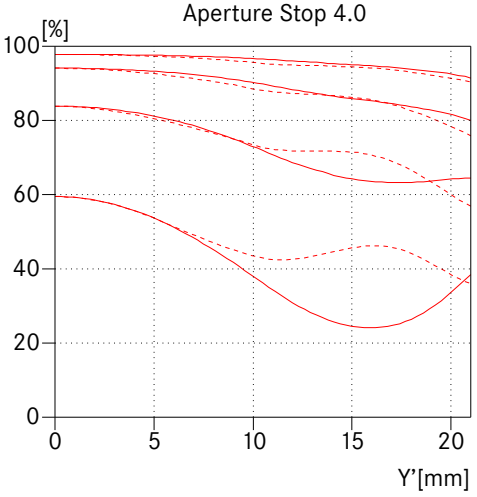
Vignetting is a continous decrease of the illumination to the edges of the image field. The graph shows the percentage lost of illumination over the image height. 100% means no vignetting.

sagittal structures

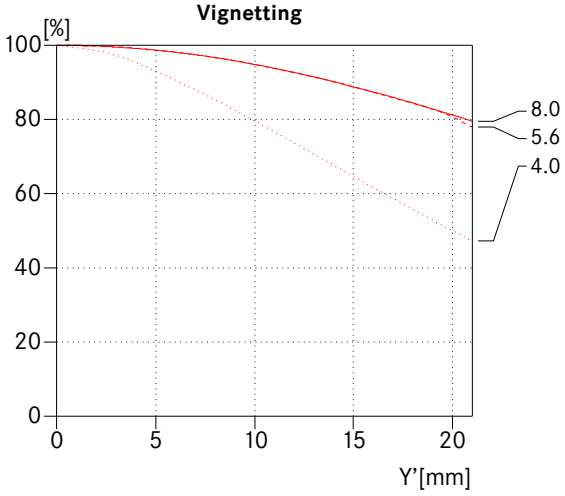
tangential structures

50 mm

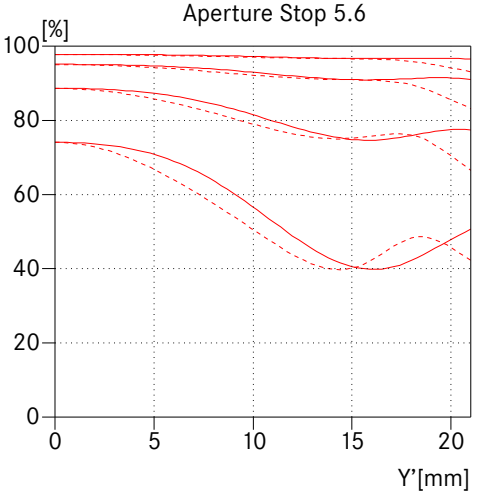
Aperture Stop 4.0



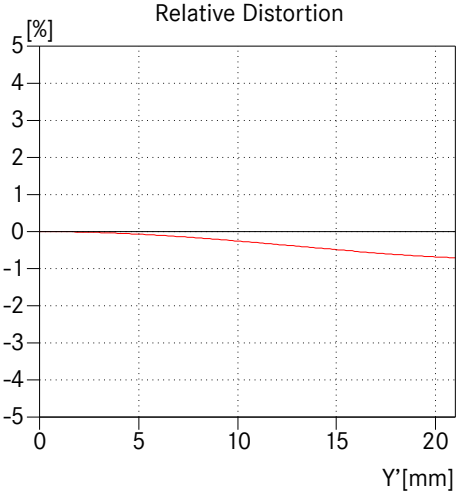
Vignetting



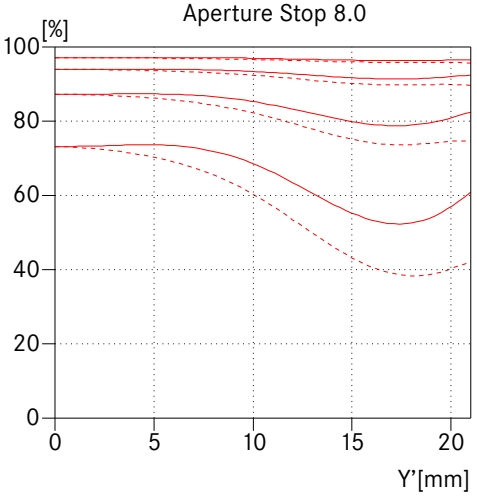
Aperture Stop 5.6



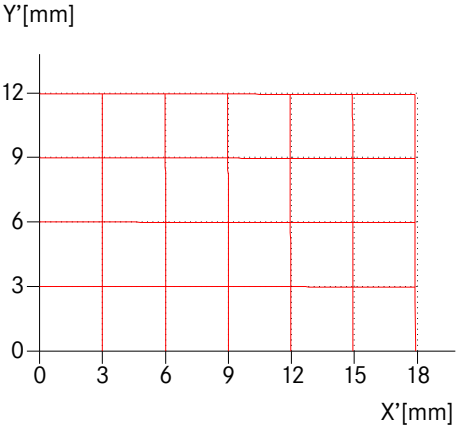
Relative Distortion



Aperture Stop 8.0

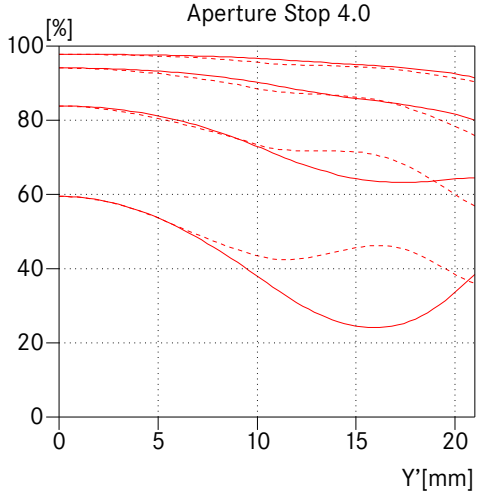


Effective Distortion

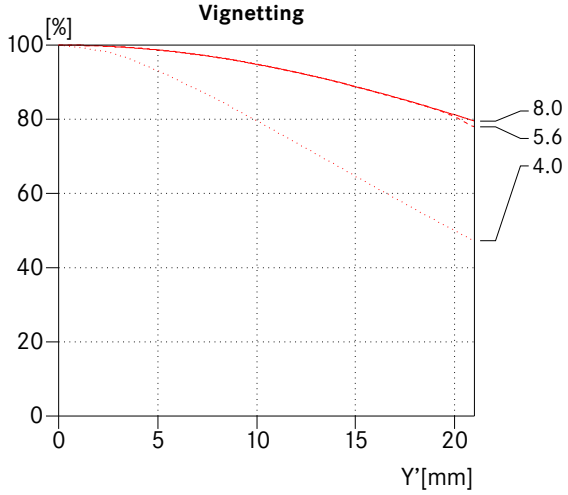


70 mm

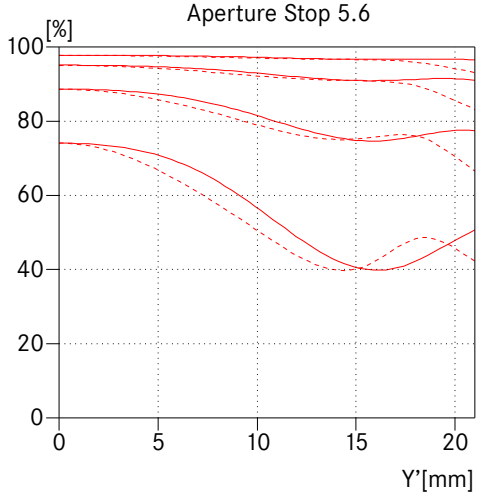
Aperture Stop 4.0



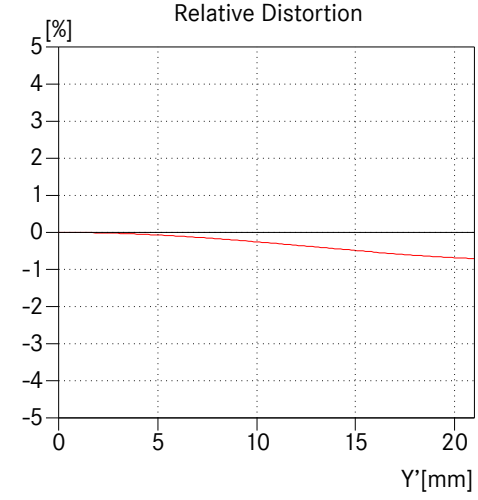
Vignetting



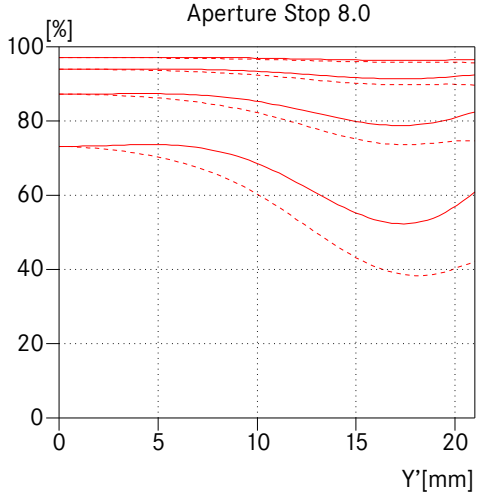
Aperture Stop 5.6



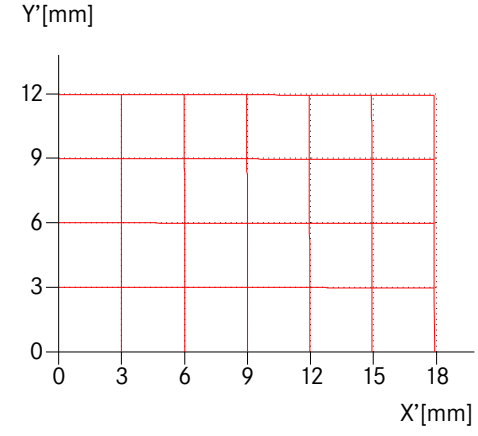
Relative Distortion



Aperture Stop 8.0

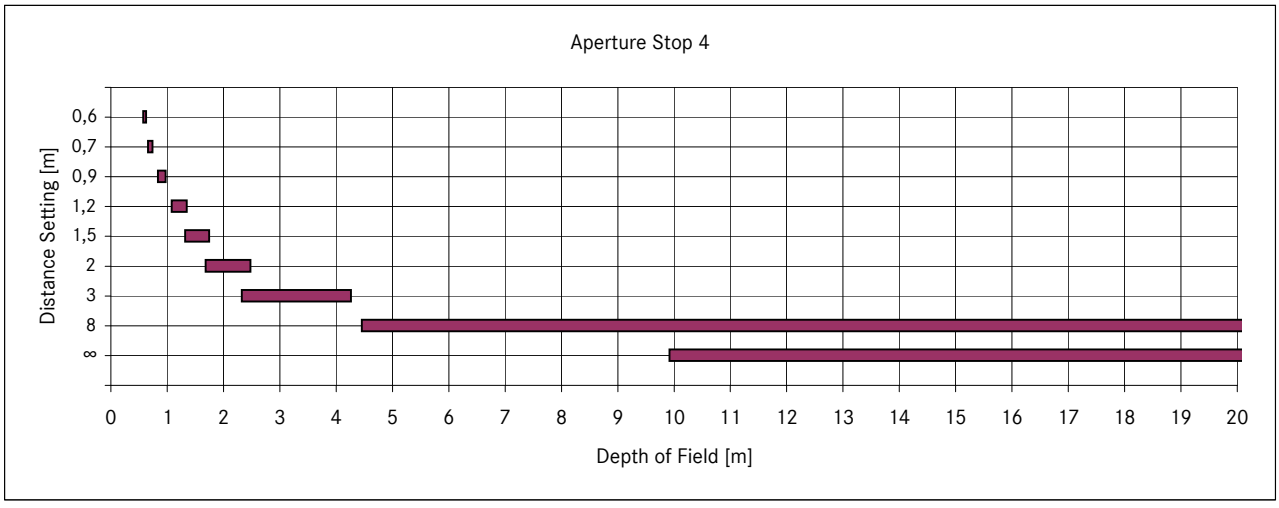


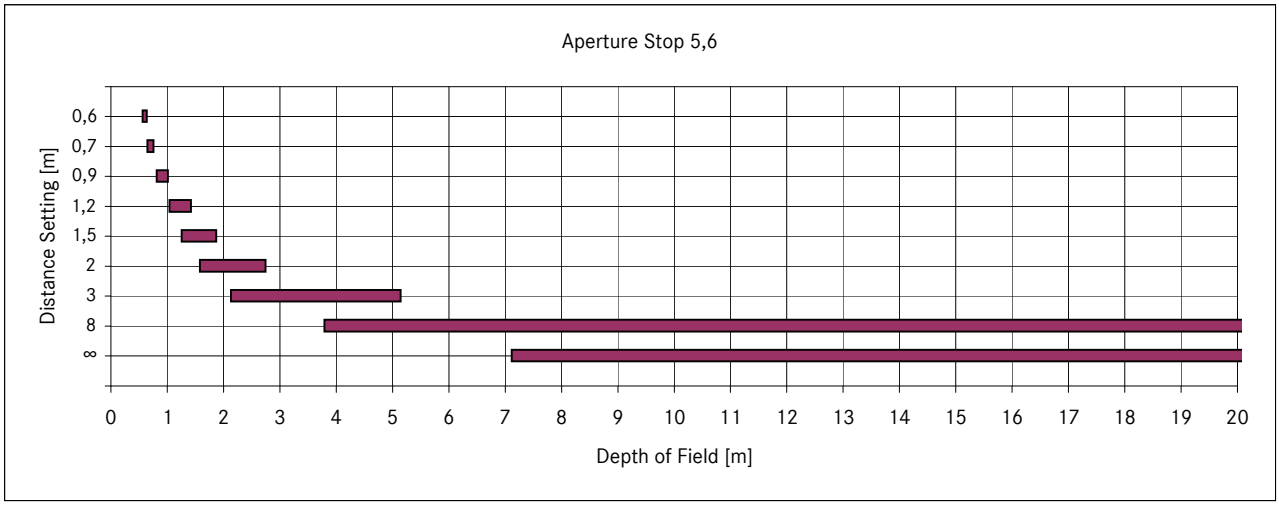
Effective Distortion

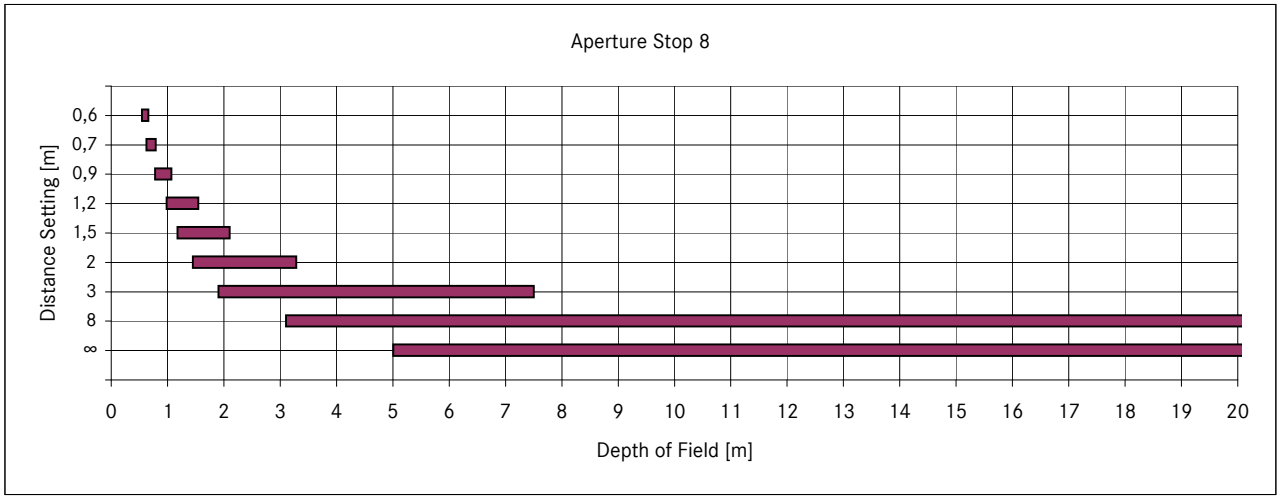


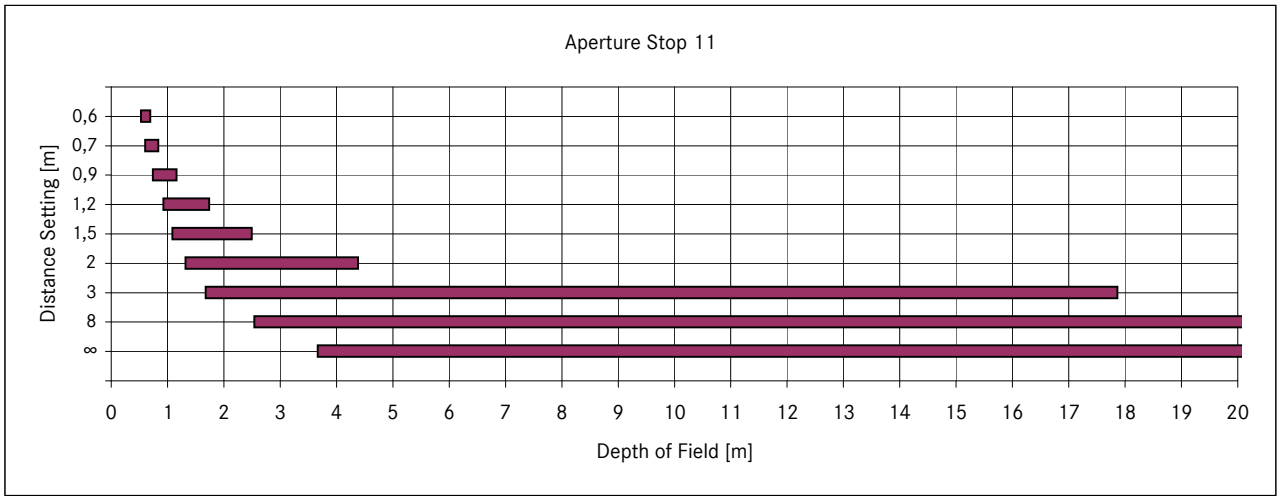
Depth of field table 35 mm

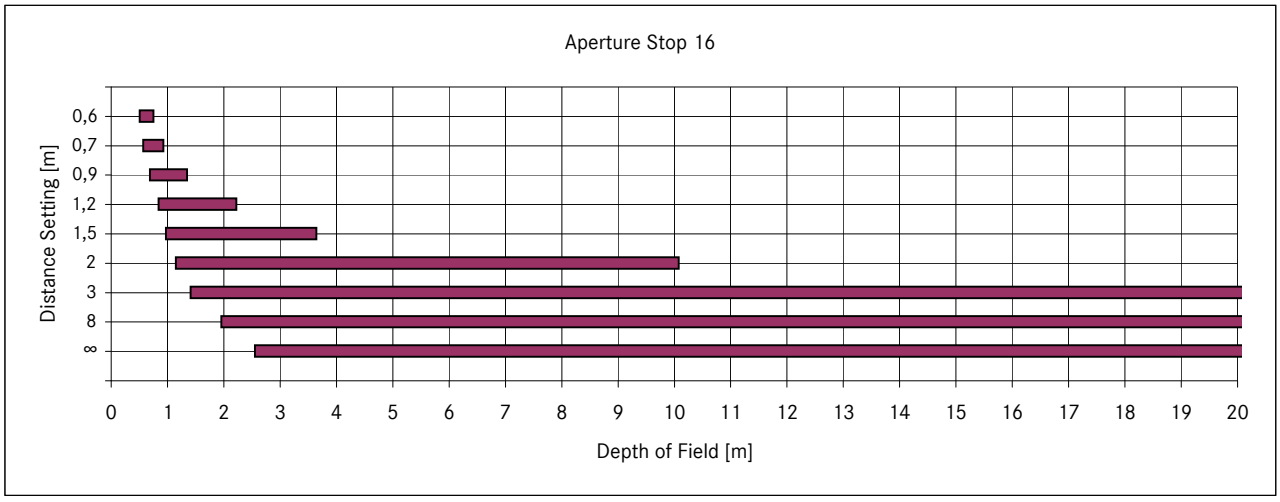
Distance Setting [m]	Aperture Stop 4	5,6	8	11	16	22	Magnification
0,6	0,572 - 0,631	0,562 - 0,645	0,547 - 0,667	0,530 - 0,697	0,505 - 0,754	0,478 - 0,840	1/14,6
0,7	0,661 - 0,745	0,647 - 0,764	0,627 - 0,797	0,604 - 0,841	0,570 - 0,930	0,534 - 1,070	1/17,5
0,9	0,834 - 0,979	0,811 - 1,015	0,778 - 1,076	0,741 - 1,163	0,688 - 1,350	0,635 - 1,684	1/23,1
1,2	1,081 - 1,351	1,041 - 1,424	0,986 - 1,550	0,926 - 1,747	0,842 - 2,228	0,761 - 3,375	1/31,4
1,5	1,316 - 1,750	1,255 - 1,876	1,174 - 2,108	1,088 - 2,499	0,972 - 3,649	0,863 - 8,459	1/39,8
2	1,680 - 2,482	1,580 - 2,751	1,452 - 3,292	1,320 - 4,385	1,149 - 10,08	0,998 - ∞	1/53,7
3	2,323 - 4,269	2,133 - 5,152	1,902 - 7,508	1,678 - 17,87	1,407 - ∞	1,183 - ∞	1/81,5
8	4,455 - 42,47	3,792 - ∞	3,105 - ∞	2,538 - ∞	1,954 - ∞	1,540 - ∞	1/220
∞	9,920 - ∞	7,114 - ∞	5,007 - ∞	3,668 - ∞	2,551 - ∞	1,882 - ∞	1/∞

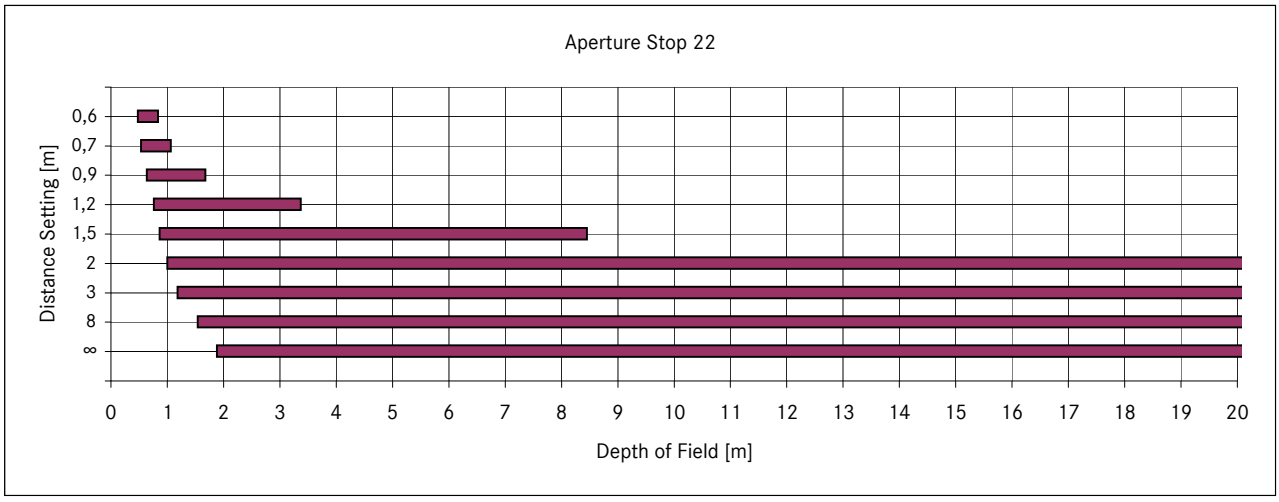





Aperture Stop 8
Distance Setting [m]
0,6
0,7
0,9
1,2
1,5
2
3
8
∞
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Depth of Field [m]

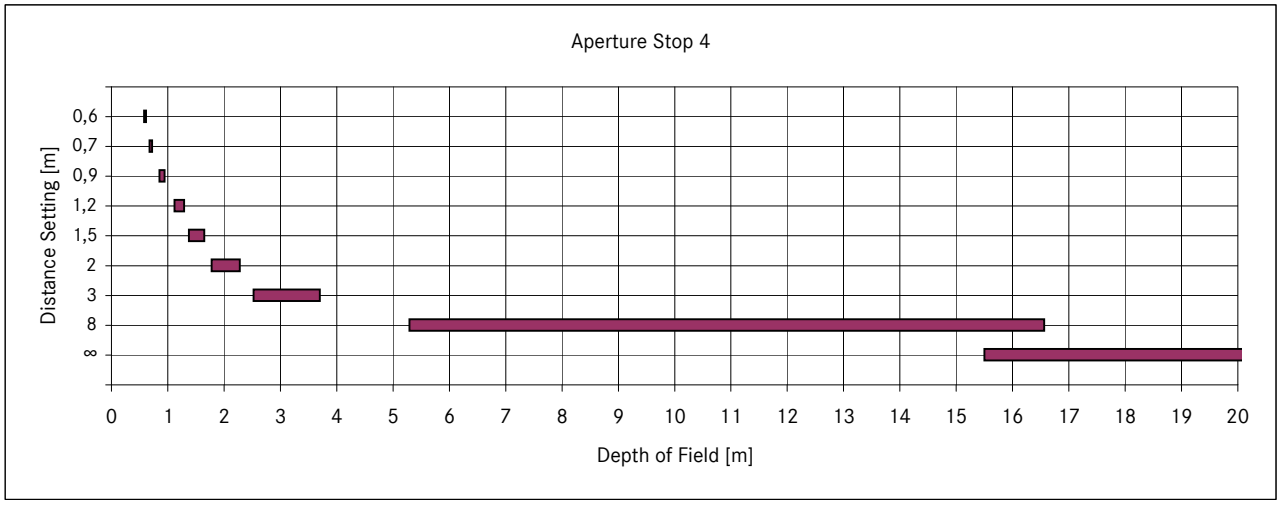

Aperture Stop 11
Distance Setting [m]
0,6
0,7
0,9
1,2
1,5
2
3
8
∞
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Depth of Field [m]

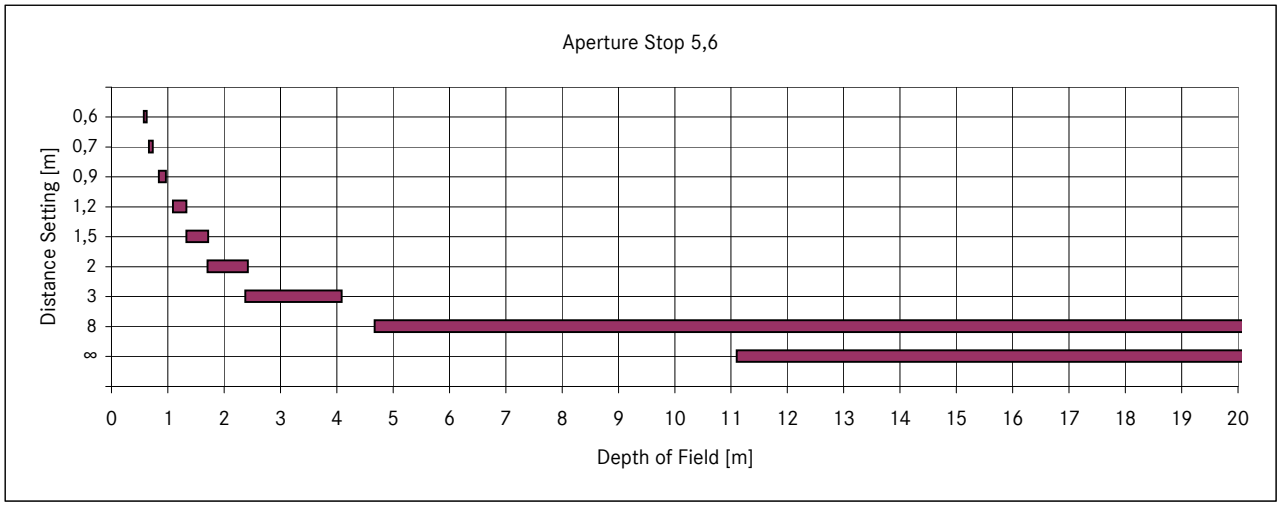

Aperture Stop 16
Distance Setting [m]
0,6
0,7
0,9
1,2
1,5
2
3
8
∞
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Depth of Field [m]

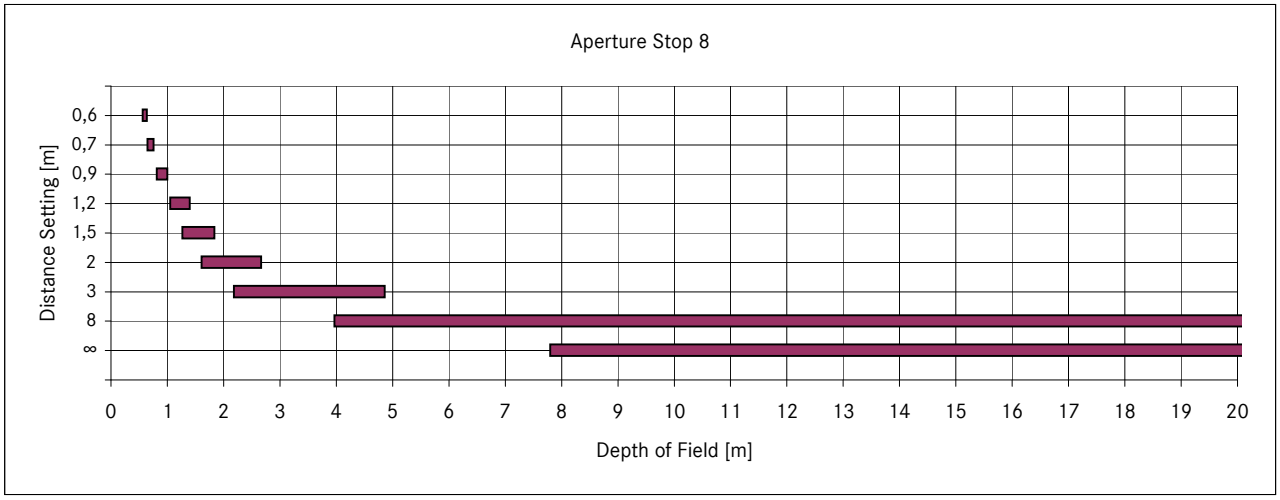

Aperture Stop 22
Distance Setting [m]
0,6
0,7
0,9
1,2
1,5
2
3
8
∞
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Depth of Field [m]

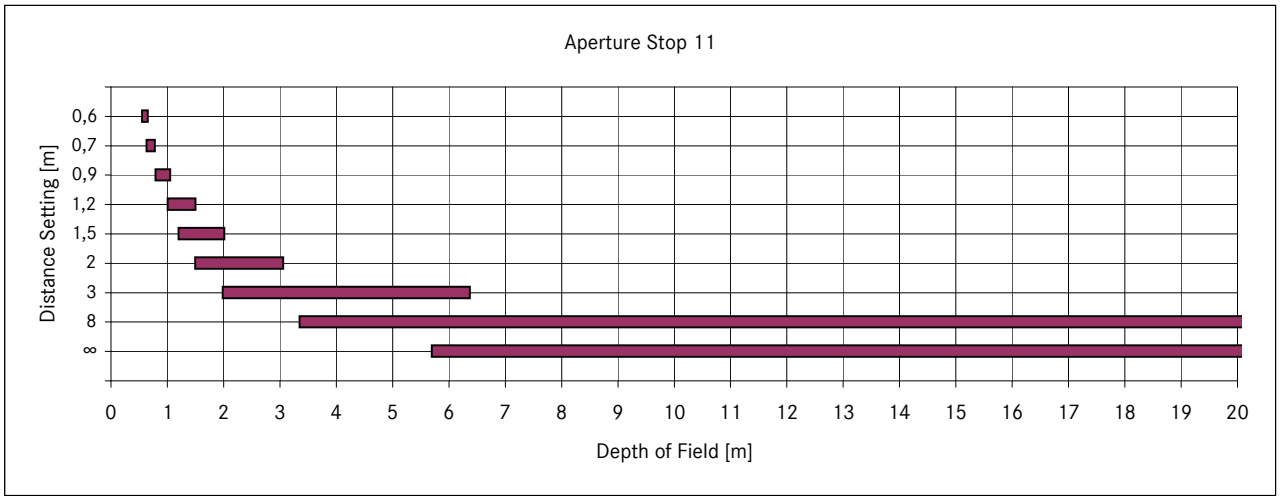
Depth of field table 50 mm

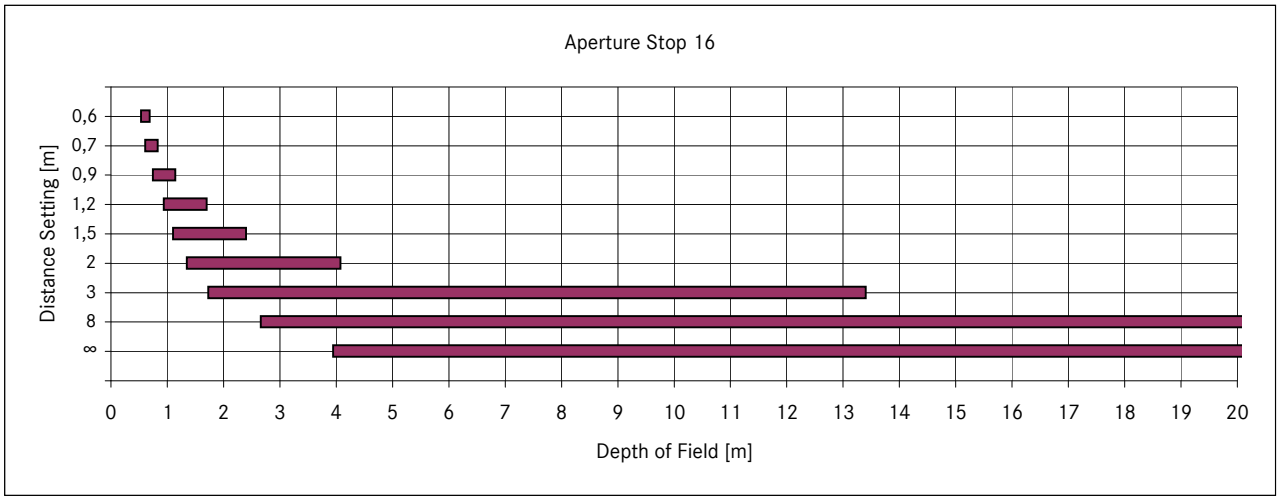
Distance Setting [m]	Aperture Stop 4	5,6	8	11	16	22	Magnification
0,6	0,581 - 0,620	0,574 - 0,629	0,563 - 0,643	0,551 - 0,661	0,532 - 0,693	0,511 - 0,738	1/11,9
0,7	0,674 - 0,729	0,664 - 0,741	0,649 - 0,761	0,633 - 0,787	0,607 - 0,835	0,579 - 0,903	1/14,1
0,9	0,855 - 0,950	0,839 - 0,972	0,815 - 1,007	0,788 - 1,055	0,747 - 1,148	0,703 - 1,285	1/18,6
1,2	1,120 - 1,294	1,091 - 1,336	1,050 - 1,405	1,004 - 1,504	0,936 - 1,705	0,867 - 2,038	1/25,3
1,5	1,375 - 1,653	1,331 - 1,723	1,270 - 1,842	1,202 - 2,018	1,104 - 2,405	1,008 - 3,141	1/32,0
2	1,780 - 2,286	1,706 - 2,426	1,606 - 2,673	1,497 - 3,066	1,346 - 4,080	1,204 - 6,839	1/43,1
3	2,525 - 3,706	2,376 - 4,094	2,183 - 4,864	1,984 - 6,376	1,725 - 13,41	1,494 - ∞	1/65,3
8	5,294 - 16,57	4,669 - 29,15	3,969 - ∞	3,346 - ∞	2,659 - ∞	2,140 - ∞	1/176
∞	15,50 - ∞	11,10 - ∞	7,795 - ∞	5,694 - ∞	3,942 - ∞	2,892 - ∞	1/∞

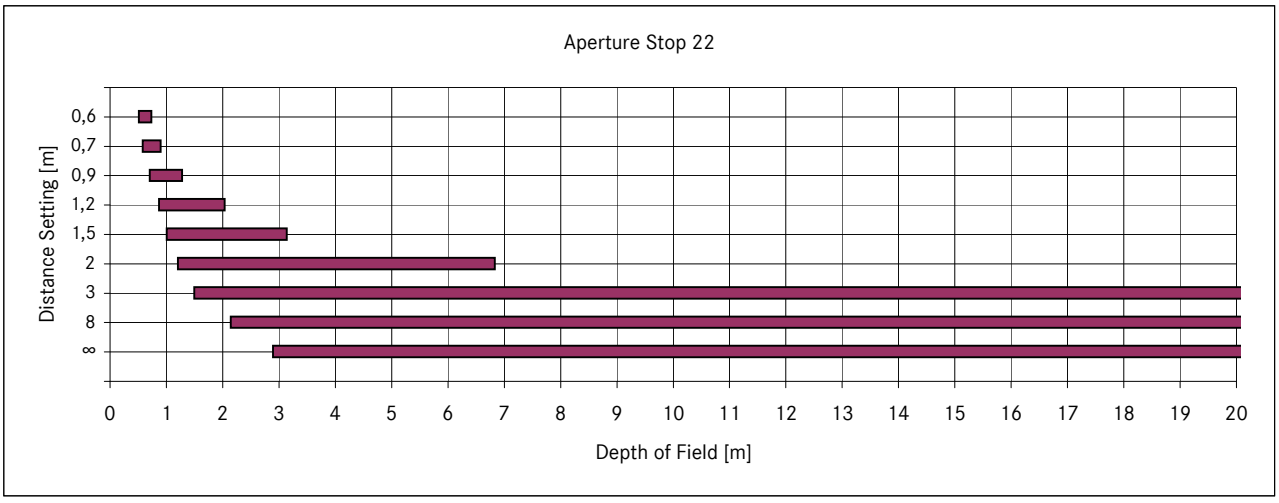





Aperture Stop 8
Distance Setting [m]
0,6
0,7
0,9
1,2
1,5
2
3
8
∞
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Depth of Field [m]

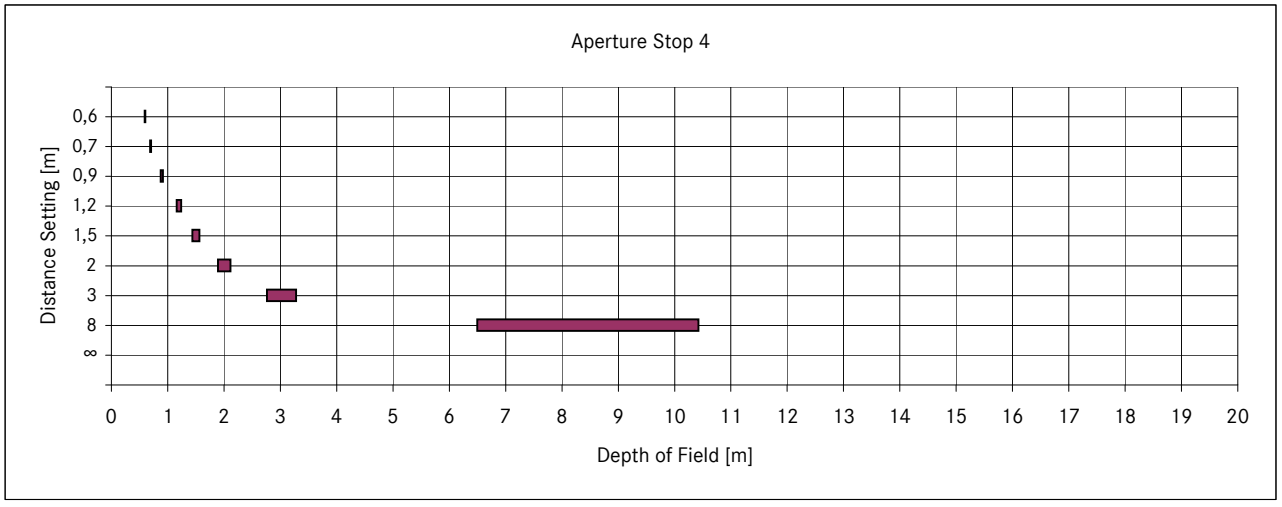

Aperture Stop 11
Distance Setting [m]
0,6
0,7
0,9
1,2
1,5
2
3
8
∞
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Depth of Field [m]

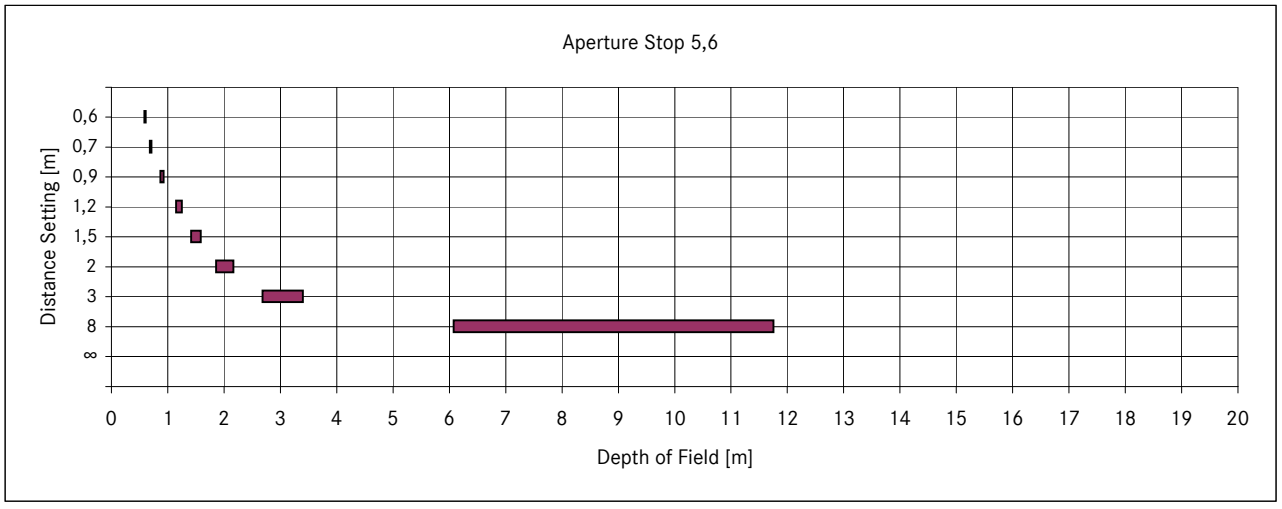

Aperture Stop 16
Distance Setting [m]
0,6
0,7
0,9
1,2
1,5
2
3
8
∞
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Depth of Field [m]


Aperture Stop 22
Distance Setting [m]
0,6
0,7
0,9
1,2
1,5
2
3
8
∞
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Depth of Field [m]

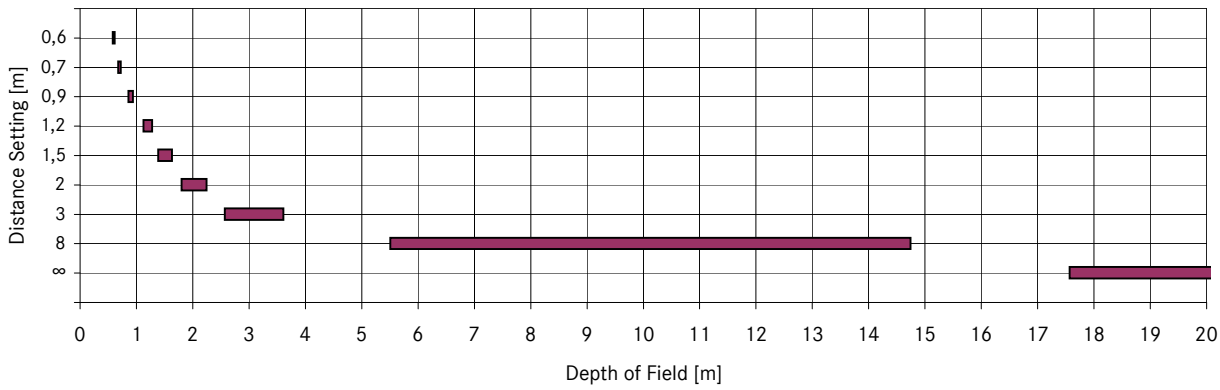
Depth of field table 70 mm

Distance Setting [m]	Aperture Stop 4	5,6	8	11	16	22	Magnification
0,6	0,591 - 0,610	0,587 - 0,613	0,582 - 0,619	0,576 - 0,627	0,566 - 0,640	0,554 - 0,656	1/7,97
0,7	0,687 - 0,713	0,683 - 0,718	0,675 - 0,727	0,667 - 0,737	0,653 - 0,756	0,637 - 0,780	1/9,46
0,9	0,878 - 0,923	0,871 - 0,932	0,859 - 0,946	0,844 - 0,965	0,822 - 0,997	0,796 - 1,040	1/12,4
1,2	1,161 - 1,242	1,148 - 1,258	1,127 - 1,285	1,101 - 1,320	1,062 - 1,384	1,019 - 1,469	1/16,9
1,5	1,439 - 1,567	1,418 - 1,593	1,386 - 1,636	1,348 - 1,695	1,289 - 1,802	1,225 - 1,952	1/21,3
2	1,892 - 2,121	1,856 - 2,170	1,800 - 2,253	1,736 - 2,366	1,638 - 2,583	1,536 - 2,906	1/28,7
3	2,762 - 3,284	2,684 - 3,404	2,569 - 3,614	2,438 - 3,917	2,249 - 4,558	2,058 - 5,681	1/43,4
8	6,494 - 10,43	6,073 - 11,76	5,507 - 14,75	4,934 - 21,66	4,209 - 100,9	3,582 - ∞	1/117
∞	34,30 - ∞	25,07 - ∞	17,57 - ∞	12,80 - ∞	8,829 - ∞	6,446 - ∞	1/∞

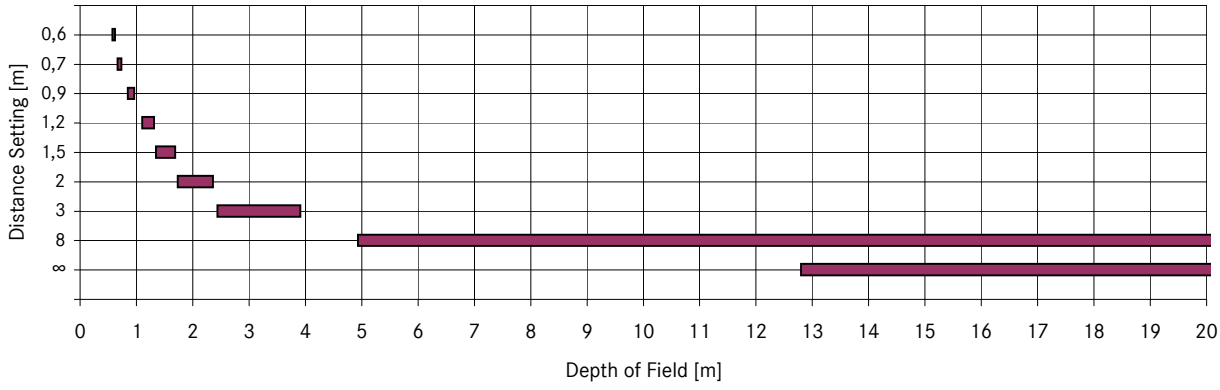




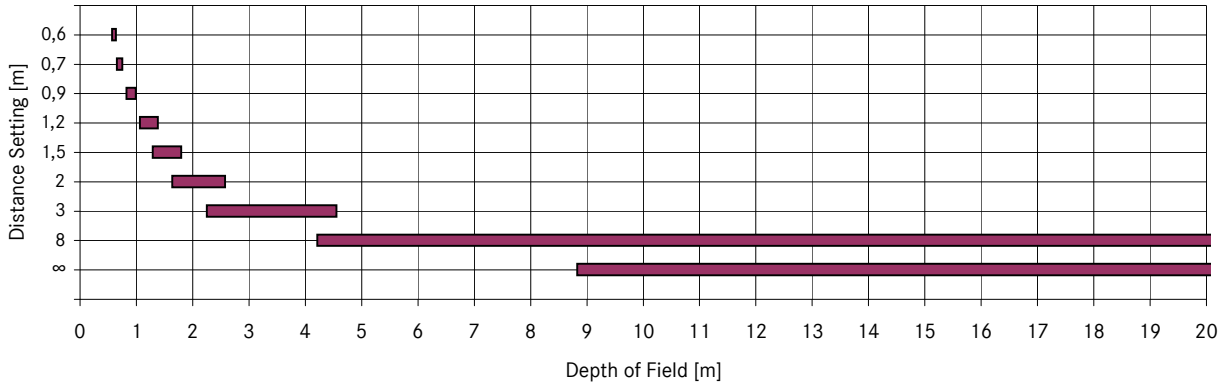
Aperture Stop 8

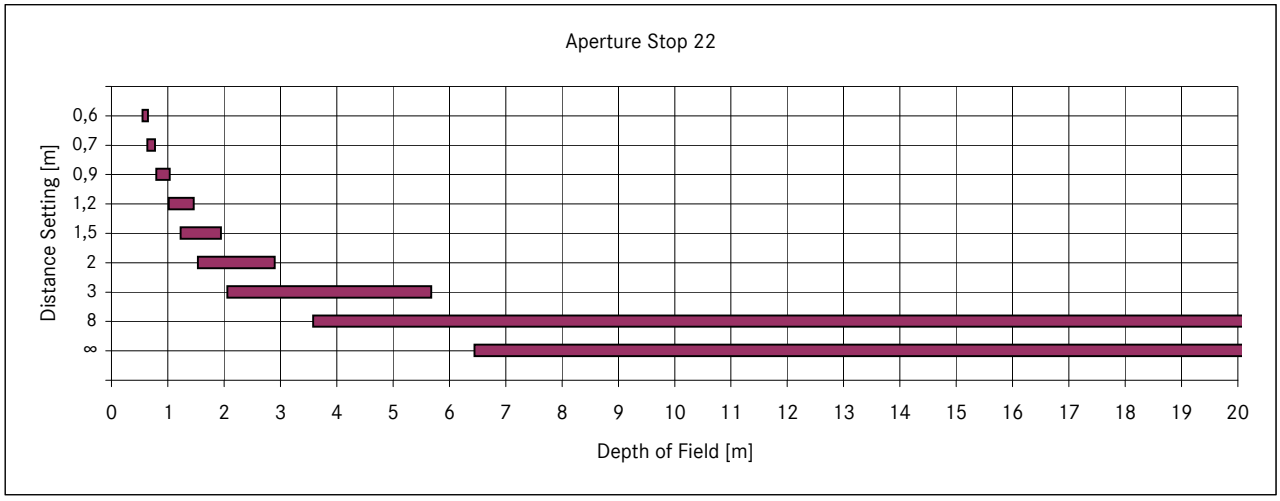


Aperture Stop 11



Aperture Stop 16




Aperture Stop 22
Distance Setting [m]
0,6
0,7
0,9
1,2
1,5
2
3
8
∞
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Depth of Field [m]