The compact high-performance telephoto lens

The new LEICA APO-SUMMICRON-M 75mm f/2 ASPH. extends the range of telephoto lenses in the Leica M system with a fast high-performance model that is simultaneously extremely compact.

75mm - The universal portrait focal length

With its more natural perspective compared to a 90mm focal length, where depth is reproduced with less compression, it is ideally suited for many applications including reportage and portraits - particularly in smaller rooms. Its small dimensions result in not only outstanding handling but also a Leica M viewfinder image that is almost completely free of shadowing, thus allowing totally undisturbed viewing of the subject. Whether you are using full stop to deliberately "isolate" critical parts of the subject or working in high-contrast available light - both very common in applications with these focal lengths - or stopping down for sharp reproduction of more extensive areas of the subject, the LEICA APO-SUMMICRON-M 75mm f/2 ASPH. is convincing in any situation: At full stop, it offers excellent contrast reproduction, even for very fine structures. This performance can only be slightly improved by stopping down. Another outstanding feature is the extremely low distortion of only 1%. The vignetting that is normal for fast lenses at their maximum opening - up to approx. 1 stop in the corners of the image here - is further reduced by stopping down: At f/2.8, it is negligible, except for the extreme corners and at f/5.6 it is negligible even in the corners.

The use of state of the art coating technology and additional measures for dulling the inner parts of the mount also ensure a high degree of freedom from reflection. The optical system comprises seven lens elements in five groups. As on the recently introduced Summilux 50mm ASPH., they are a new version of the double Gauß lens type, with the first three lens elements corresponding to the typical Gauß design. The elements behind the aperture are very similar to those on the Summilux 50mm ASPH. - apart from the use of a single lens instead of one of the two cemented lens element groups.
To achieve the excellent imaging performance, glass with anomalous partial dispersion is used (no. 2/3). Lens element no. 2 is made of a fluorite-type glass, while the glass used for lens element 3 can trace its origins back to the former Leitz glass laboratory. Lens element no. 4 has a pressed aspherical surface. To minimize monochromatic aberrations, as well as having an aspherical shape the glass used is also highly refractive (no. 5/6).

Optimum image quality at close and long range

To maintain the outstanding imaging performance even at the minimum range of 0.7m - the Summilux-M 75mm only achieves 1m - as on the Summilux-M 50mm ASPH., a so-called floating element is used. This final lens element (no. 6/7) changes its position relative to the rest of the optical system during focusing. While the fundamental technology is common in SLR lenses, to achieve this in a compact M lens with its very limited space, the Leica designers had to develop a brand new, extremely precise adjusting mechanism. Its use allows the benefits of this design to be utilized to the full, while at the same time guaranteeing the familiar silky smooth and absolutely accurate focusing of the M lenses.

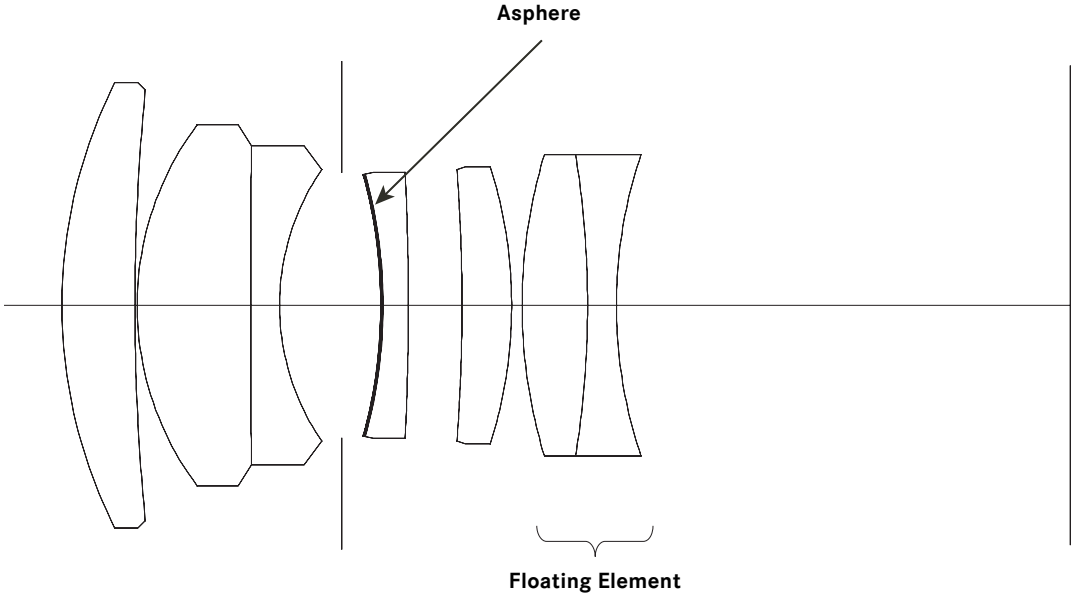
Quality down the finest detail

A feature that has now become a standard for Leica lenses has also been included on the new LEICA APO-SUMMICRON-M 75mm f/2 ASPH.: The built-in lens hood, which protects against stray light and dirt, can be locked in its extended position to prevent it accidentally being pushed back in.

Summary:

By utilizing every means available in lens technology today - an aspherical surface, glass with anomalous partial dispersion and a high refractive index, a floating element including a brand new, high-precision adjusting mechanism, state of the art coating techniques and sophisticated measures to reduce internal reflection - we have created a lens that not only extends the Summicron-M range but also sets new standards in this focal length class. In the group of four fast M telephoto lenses with focal lengths of 75 and 90mm, the new LEICA APO-SUMMICRON-M 75mm f/2 ASPH. represents an ideal combination of several properties: It combines optimum imaging quality with high speed and compact dimensions. In conjunction with its moderated telephoto perspective, this makes it ideal for almost any application, and along with a wide-angle lens it forms a complete and versatile but still very compact equipment set.

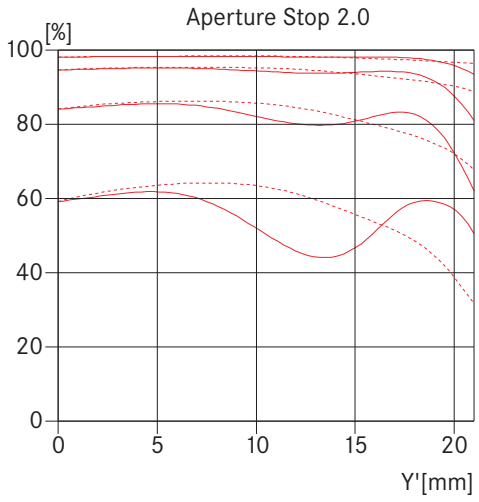
Lens shape

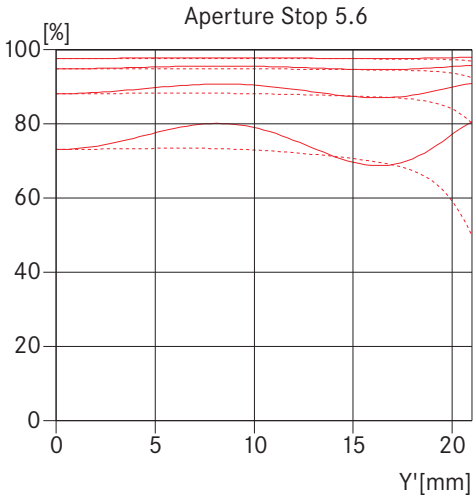


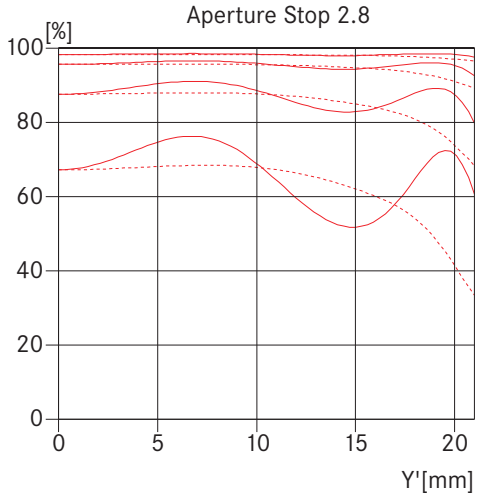
Engineering drawing

Technical Data	
Angle of view (diagonal, horizontal, vertical)	32°, 27°, 18°
Optical design	**Number of elements / groups:** 7/5
	Focal length: 74.98 mm
	Entrance pupil: 30.1 mm (related to the first lens surface in light direction)
Distance setting	**Focusing range:** 0.7 m to Infinity
	Scale: combined meter/feet-increments
	Smallest object field: 169 x 254 mm
	Highest reproduction ratio: 1:7
Diaphragm	**Setting / Type:** Preset, with click-stops, half values available
	Smallest aperture: f/16
Bayonet	Leica M quick-change bayonet
Filter (type)	Internal thread for screw-on filters size E49, non-rotating
Lens hood	Built-in, telescopic, lockable
Dimensions and weight	**Length:** 66.8 mm
	Largest diameter: 58 mm
	Weight: approx. 430 g

MTF graphs





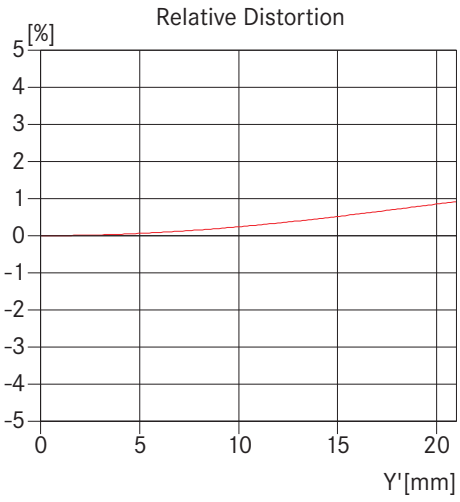


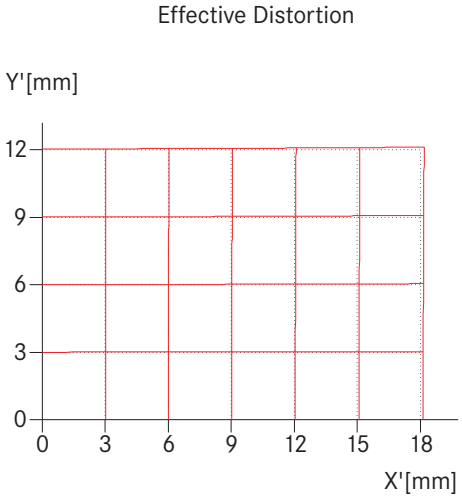
The MTF is indicated both at full aperture and atf/5.6 at long taking distances (infinity). Shownis the contrast in percentage for 5, 10, 20 and40 lp/mm accross the height of the 35 mm filmformat, for tangential (dotted line) and sagittal(solid line) structures, in white light. The 5 and10 lp/mm will give an indication regarding thecontrast ratio for large object structures.The20 and 40 lp/mm records the resolution of finerand finest object structures.

sagittal structures

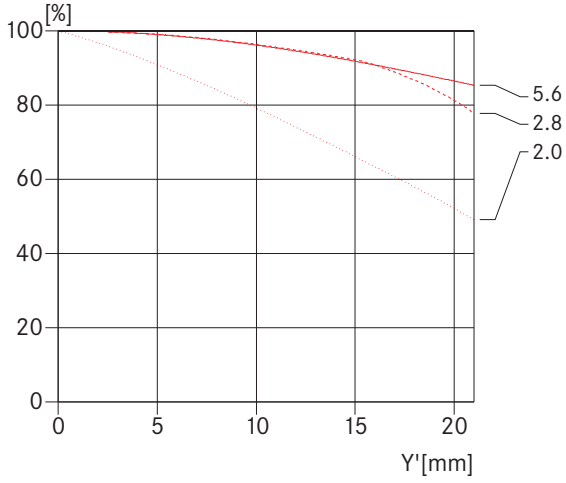
tangential structures

Distortion





Vignetting

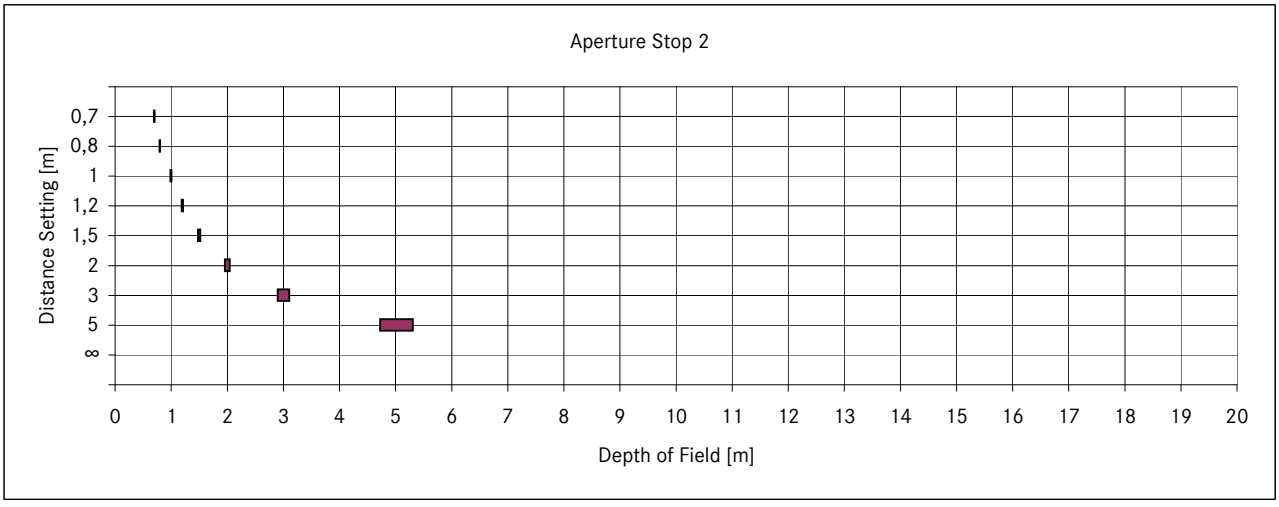


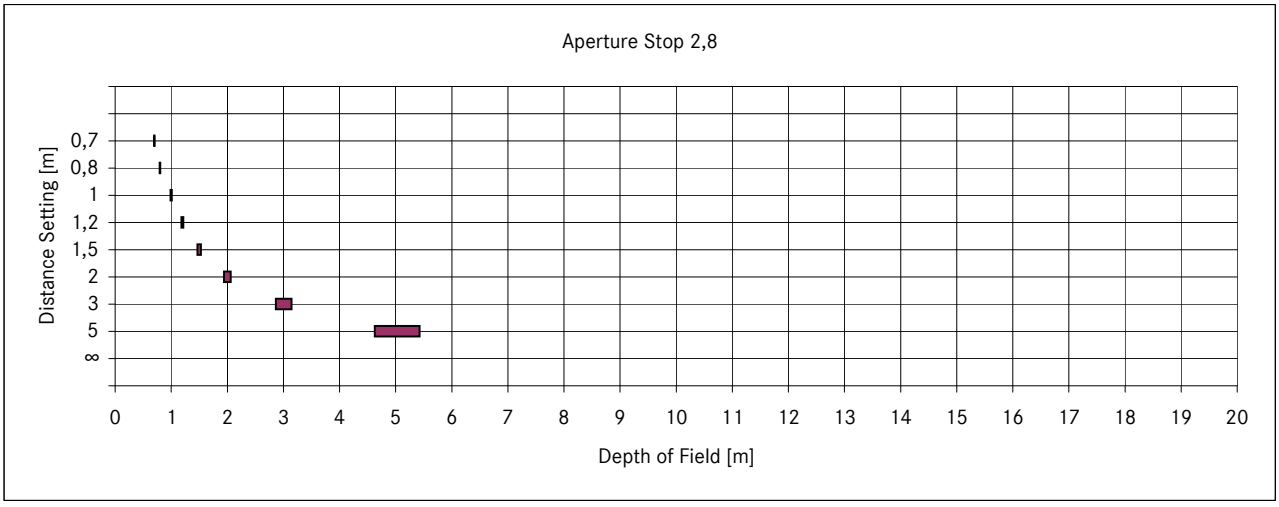
Distortion is the deviation of the real image height(in the picture) from the ideal image height. Therelative distortion is the percentage deviation.The ideal image height results from the objectheight and the magnification. The image height of21.6mm is the radial distance between the edge andthe middle of the image field for the format 24mm x36mm. The graph of the effective distortion illustra-tes the appearance of straight horizontal and verti-cal lines in the picture.

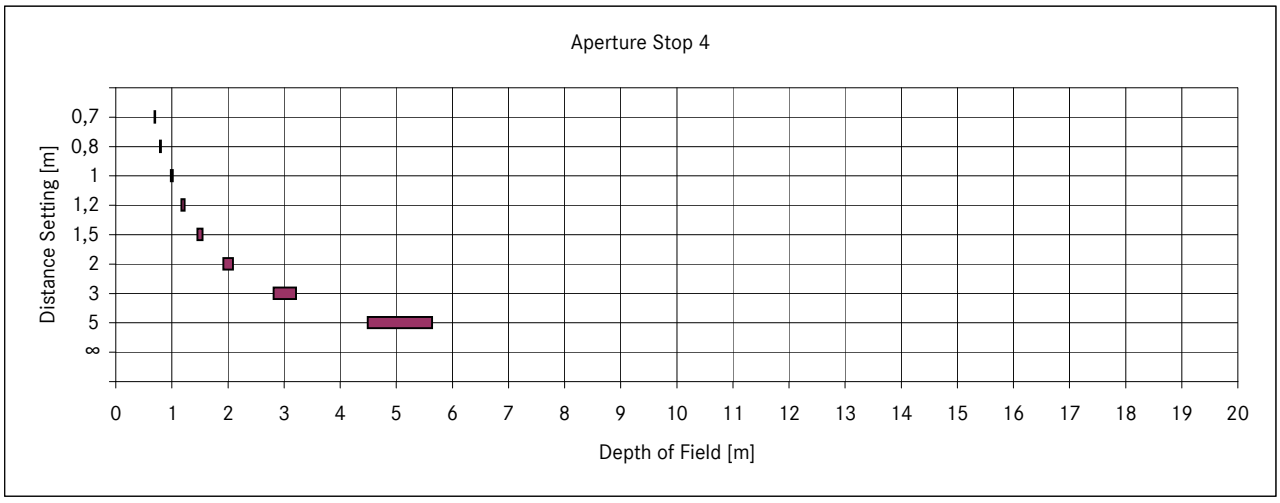
Vignetting is a continous decrease of the illumina-tion to the edges of the image field. The graphshows the percentage lost of illumination over theimage height. 100% means no vignetting.

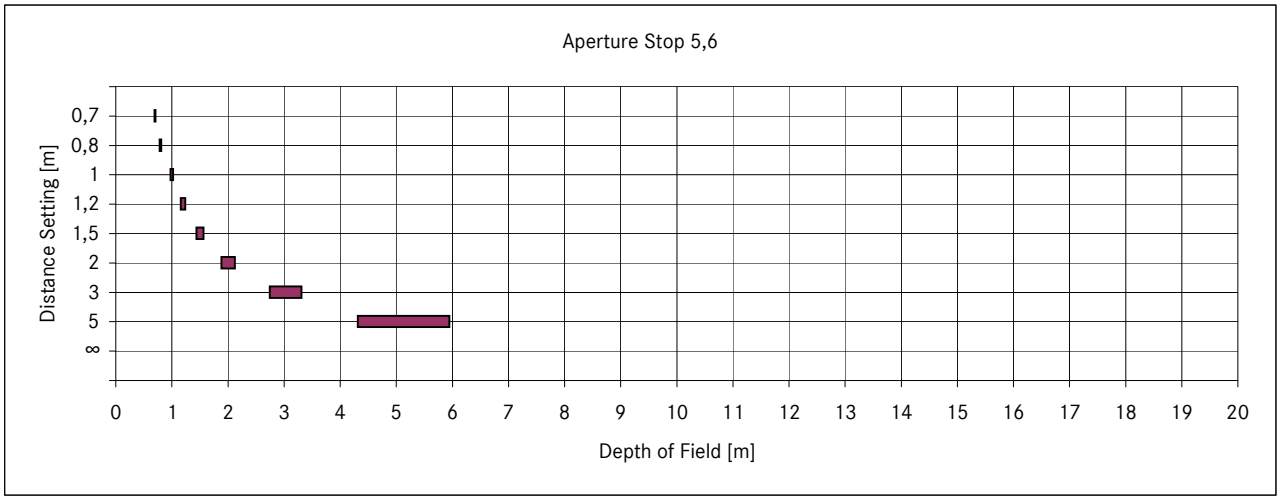
Depth of field table

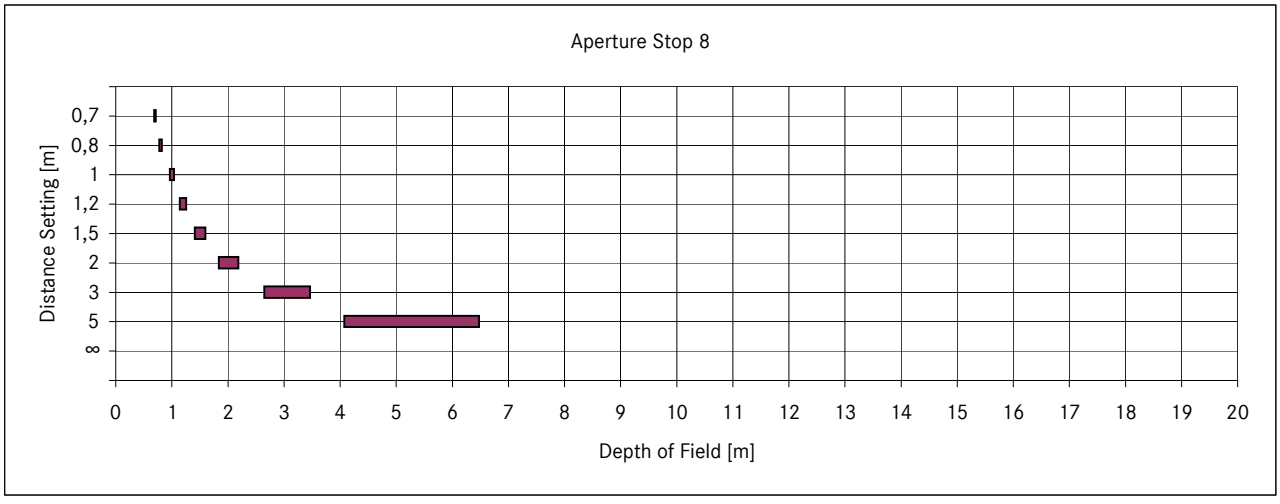
Distance Setting [m]	Aperture Stop 2,0	2,8	4	5,6	8	11	16	Magnification
0,7	0,695 - 0,705	0,694 - 0,706	0,691 - 0,709	0,688 - 0,713	0,683 - 0,719	0,676 - 0,726	0,666 - 0,738	1/7,02
0,8	0,794 - 0,806	0,792 - 0,809	0,788 - 0,812	0,783 - 0,818	0,776 - 0,825	0,768 - 0,835	0,754 - 0,852	1/8,37
1	0,990 - 1,011	0,986 - 1,014	0,980 - 1,021	0,973 - 1,029	0,962 - 1,042	0,948 - 1,059	0,926 - 1,088	1/11,1
1,2	1,185 - 1,216	1,180 - 1,221	1,171 - 1,231	1,160 - 1,243	1,143 - 1,263	1,124 - 1,288	1,092 - 1,333	1/13,8
1,5	1,476 - 1,525	1,467 - 1,534	1,454 - 1,550	1,436 - 1,570	1,410 - 1,603	1,379 - 1,645	1,331 - 1,721	1/17,8
2	1,956 - 2,047	1,941 - 2,063	1,916 - 2,092	1,885 - 2,131	1,840 - 2,192	1,786 - 2,275	1,704 - 2,427	1/24,5
3	2,899 - 3,108	2,865 - 3,148	2,811 - 3,217	2,742 - 3,313	2,645 - 3,468	2,534 - 3,684	2,367 - 4,113	1/37,8
5	4,722 - 5,314	4,630 - 5,435	4,488 - 5,645	4,312 - 5,954	4,073 - 6,485	3,809 - 7,302	3,439 - 9,249	1/64,5
∞	82,78 - ∞	60,91 - ∞	42,65 - ∞	30,48 - ∞	21,35 - ∞	15,55 - ∞	10,71 - ∞	1/∞

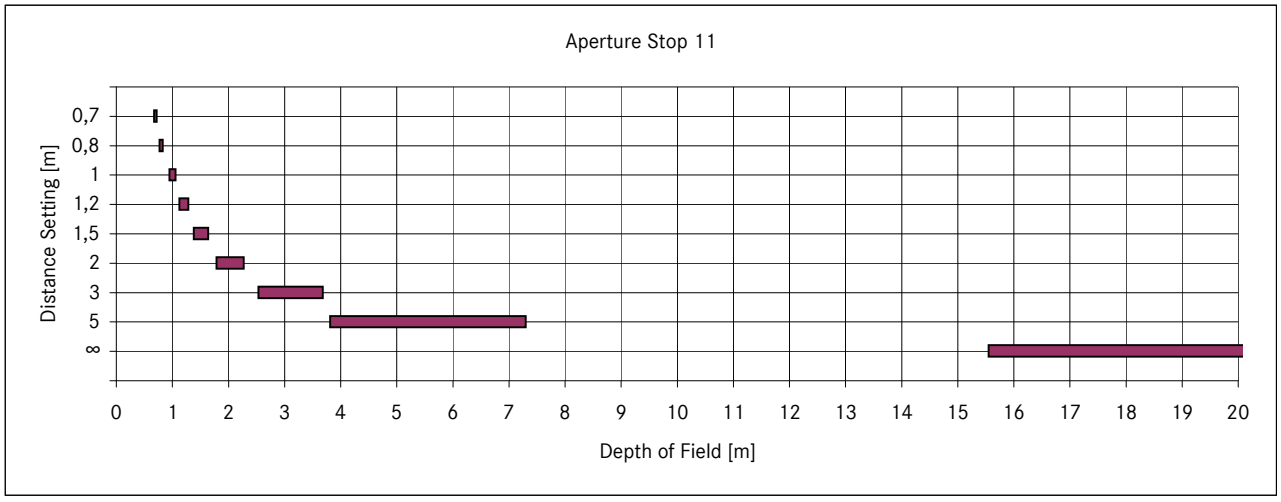


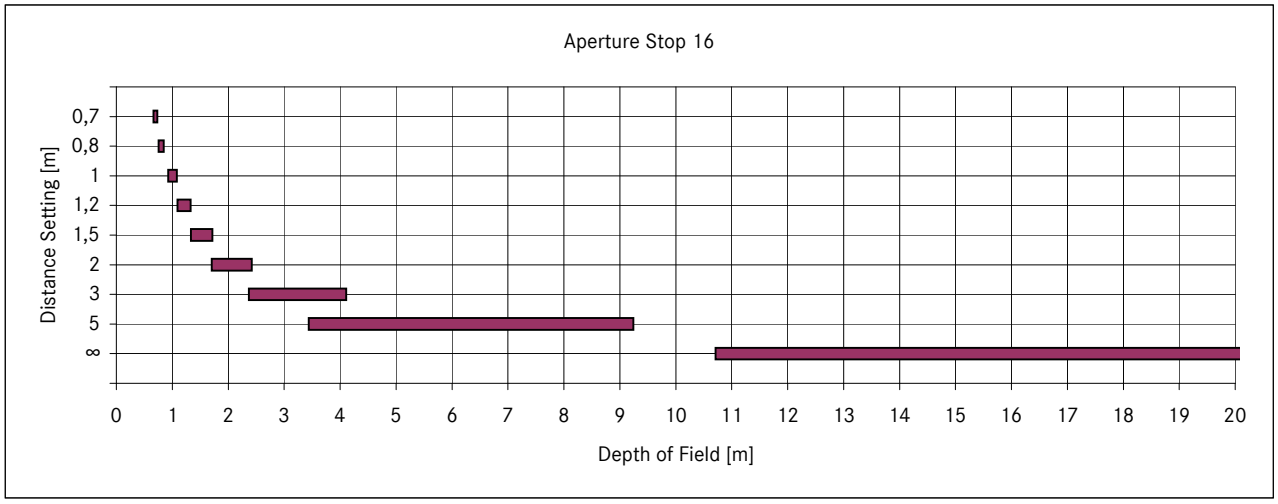



Aperture Stop 4
Distance Setting [m]
0,7
0,8
1
1,2
1,5
2
3
5
∞
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Depth of Field [m]


Aperture Stop 5,6
Distance Setting [m]
0,7
0,8
1
1,2
1,5
2
3
5
∞
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 8
Distance Setting [m]
0,7
0,8
1
1,2
1,5
2
3
5
∞
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]
0,7
0,8
1
1,2
1,5
2
3
5
∞
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]
0,7
0,8
1
1,2
1,5
2
3
5
∞
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]