



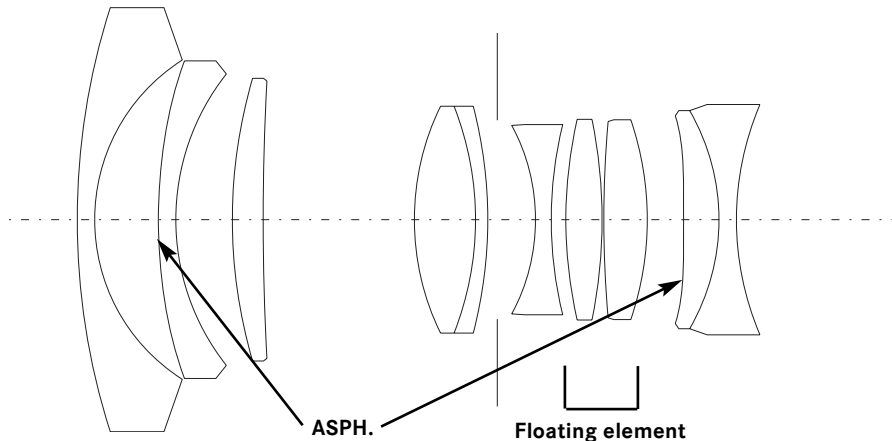
LEICA SUMMILUX-M 21 mm f/1.4 ASPH.



The LEICA SUMMILUX-M 21mm f/1.4 ASPH extends Leica's series of high speed M lenses into the wide-angle range. It offers excellent performance over the entire image field even at full stop and in the close-up range thanks to a "floating element". Stopping down to 2.8 leads to an absolutely outstanding image quality, in fact, in comparison to the Elmarit lens of the same focal length, its rendition is slightly more uniform across the image field. The vignetting typical of every optical system is naturally more apparent with a super wide angle lens, particularly a high speed one like this, than on standard lenses or those with a long focal length. At full stop with the 35mm format, its maximum - i.e. in the corners of the image - is around 3.2 aperture stops or, with the Leica M8 models and their slightly smaller format, around 1.9 aperture stops. Stopping down to 2.8 visibly reduces this light fall-off towards the image edges to 1.7 or 0.8 aperture stops. Stopping down further does not bring any noticeable additional reduction, as all that remains is essentially the natural vignetting. The maximum distortion of the lens is 2.3%, which in practical terms is negligible for the majority of photographic applications. A total of ten lens elements are used to achieve this exceptional performance. To correct color aberrations, five of these are made of glass types with anomalous color dispersion (partial dispersion), while a further two have aspherical surfaces. To maintain performance in the close-up range, one group towards the rear of the optical system is a "floating element" that moves independently of the rest of the mechanism.

Summary: The LEICA SUMMILUX-M 21mm f/1.4 ASPH offers maximum image performance with a focal length / speed combination previously unavailable in the M system. This extends the composition options of M photography, particularly for available light shots, but also thanks to a previously unattainable reduction in the depth of field in combination with large angles of view.

— Lens shape





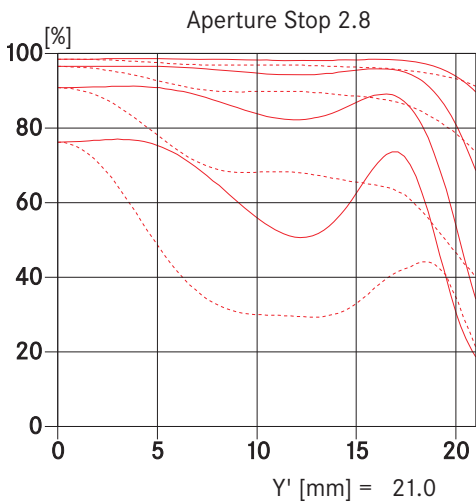
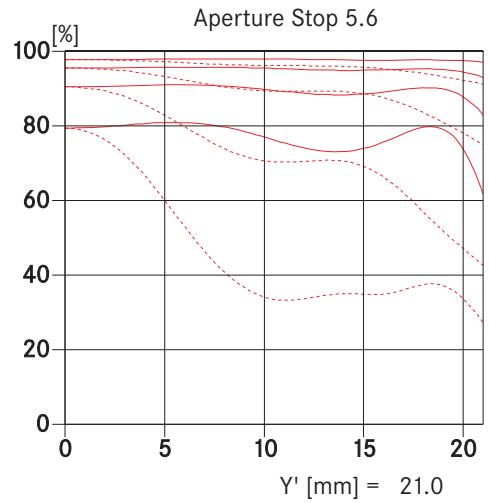
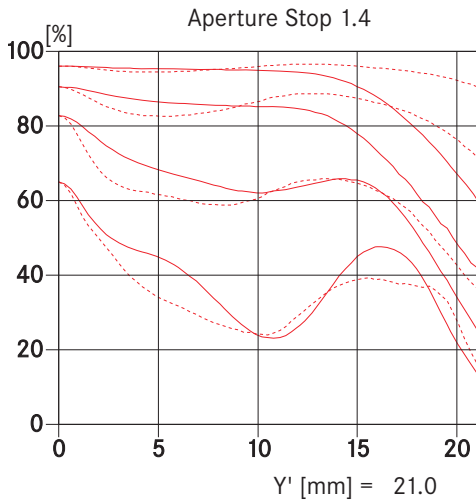
— Engineering drawing

Technical Data

Angle of view (diagonal, horizontal, vertical)	92° / 81° / 59°
Optical design	Number of lenses/groups: 10 / 8 Focal length: 21.6 mm Position of entrance pupil: 24.4 mm (related to the first lens surface in light direction) Focusing range: 0.7 m to infinity
Distance setting	Scales: Combined meter/feet graduation Smallest object field: 685 x 1027 mm Largest reproduction ratio: 1:29
Aperture	Setting/Function: With click-stops, half values available, manual diaphragm Lowest value: 16
Bayonet	Leica M quick-change bayonet with 6 bit lens identification bar code for digital M models
Filter mount	Series filter VIII in lens hood
Lens hood	Separate, screw-on type
Dimension and weight	Length: 66 / 77 mm (without / with lens hood) Largest diameter: approx. 69.5 mm Weight: approx. 580 g



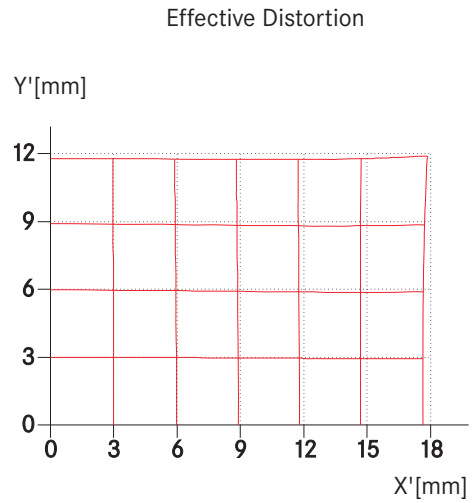
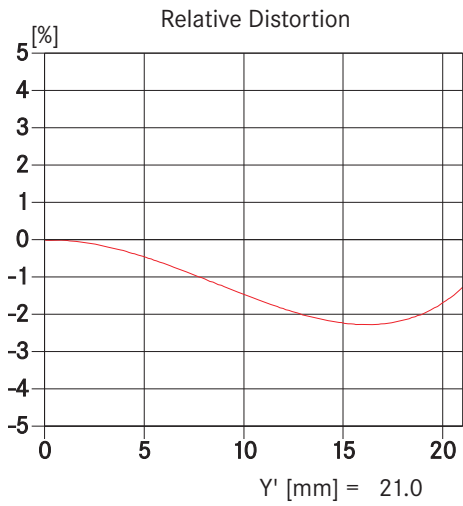
— MTF graphs



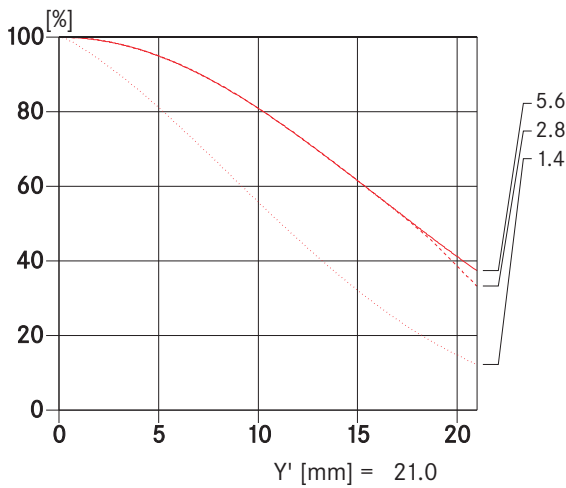
The MTF is indicated both at full aperture and at f/5.6 at long taking distances (infinity). Shown is the contrast in percentage for 5, 10, 20 and 40 lp/mm across the height of the 35 mm film format, for tangential (dotted line) and sagittal (solid line) structures, in white light. The 5 and 10 lp/mm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



— 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 continuous decrease of the illumination to the edges of the image field. The graph shows the percentage loss of illumination over the image height. 100% means no vignetting.



Depth of field table

Distance Setting [m]	Aperture Stop								Magnification
	1,4	2	2,8	4	5,6	8	11	16	
0,7	0,661 - 0,744	0,648 - 0,762	0,630 - 0,790	0,605 - 0,837	0,574 - 0,910	0,534 - 1,050	0,493 - 1,308	0,438 - 2,275	1/28,7
0,8	0,749 - 0,860	0,731 - 0,884	0,708 - 0,924	0,675 - 0,991	0,636 - 1,098	0,586 - 1,316	0,535 - 1,765	0,469 - 4,314	1/33,3
1	0,918 - 1,099	0,892 - 1,142	0,855 - 1,211	0,806 - 1,333	0,749 - 1,545	0,679 - 2,039	0,609 - 3,457	0,523 - ∞	1/42,6
1,2	1,081 - 1,350	1,044 - 1,416	0,993 - 1,527	0,926 - 1,734	0,850 - 2,120	0,759 - 3,219	0,671 - 9,613	0,565 - ∞	1/51,9
1,5	1,315 - 1,749	1,259 - 1,864	1,184 - 2,068	1,087 - 2,477	0,982 - 3,381	0,859 - 7,657	0,746 - ∞	0,615 - ∞	1/65,8
2	1,678 - 2,483	1,585 - 2,729	1,465 - 3,201	1,317 - 4,339	1,162 - 8,347	0,991 - ∞	0,840 - ∞	0,675 - ∞	1/88,9
3	2,318 - 4,277	2,139 - 5,088	1,922 - 7,085	1,670 - 17,48	1,424 - ∞	1,170 - ∞	0,961 - ∞	0,747 - ∞	1/135
5	3,334 - 10,14	2,970 - 16,51	2,560 - 243,7	2,125 - ∞	1,736 - ∞	1,368 - ∞	1,087 - ∞	0,817 - ∞	1/228
∞	9,734 - ∞	7,113 - ∞	5,102 - ∞	3,593 - ∞	2,587 - ∞	1,832 - ∞	1,351 - ∞	0,951 - ∞	1/∞

