



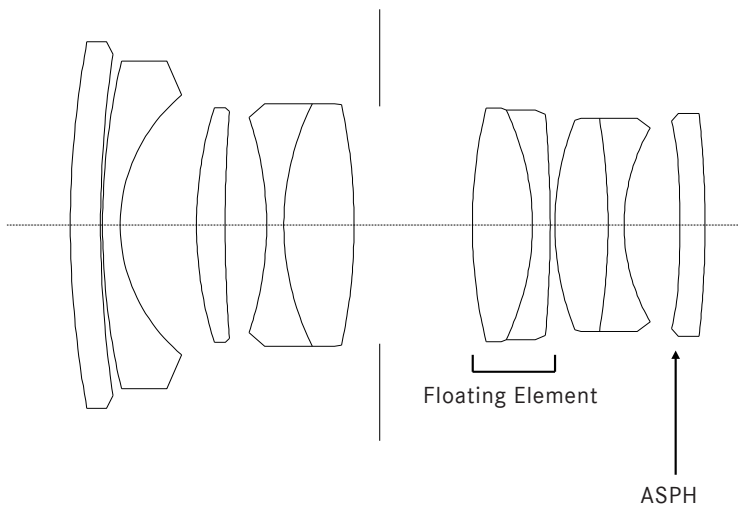
# LEICA SUMMILUX-M 28mm f/1.4 ASPH.



The Leica Summilux-M 28mm f/1.4 ASPH. rounds off the range of high-speed M wide angle focal lengths. It offers excellent image performance over the entire image field even at full aperture and in the close-up range thanks to a „floating element“. With its exceptional contrast, the lens delivers the same recognized high performance level as the Leica Summilux-M 35mm f/1.4 ASPH., and in some respects actually outperforms it. The vignetting that is typical of every optical system is naturally more defined on a wide angle lens, particularly a high speed one like this, than on standard lenses or those with a long focal length. At full aperture in 35mm format it is a maximum, i.e. in the corners of the image, of around 3.4 stops, around 2 stops on Leica M8 models with their slightly smaller format. Stopping down to 5.6 visibly reduces this light falloff – to 1.8 and 0.8 stops respectively. Stopping down further does not bring about any notable reduction as essentially only the natural vignetting remains. Distortion is extremely low for a wide angle lens at a maximum of 1.1% , which is rarely noticeable in practice. A total of ten lens elements are used to achieve this exceptional performance. To correct color defects, seven of these are made of glass types with anomalous partial dispersion, while one has an aspherical surface. To maintain performance in the close-up range, one element 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 28mm 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 combined with large field angles.

## — Optical design





# LEICA SUMMILUX-M 28mm f/1.4 ASPH.

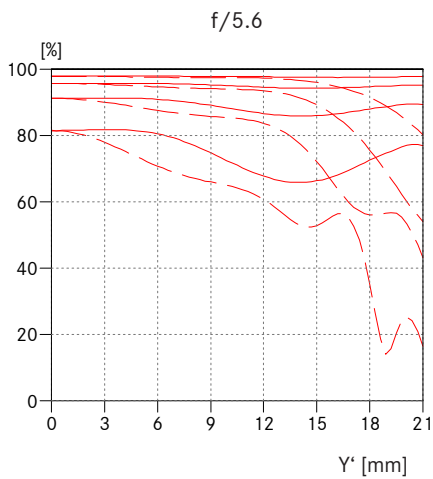
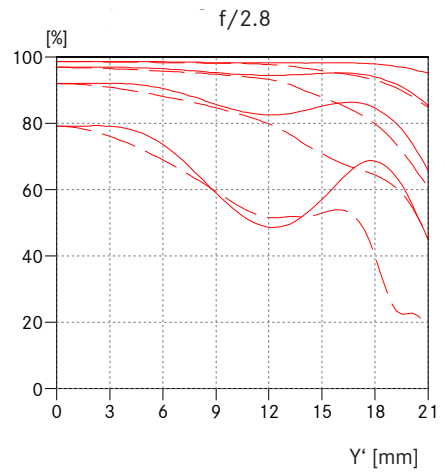
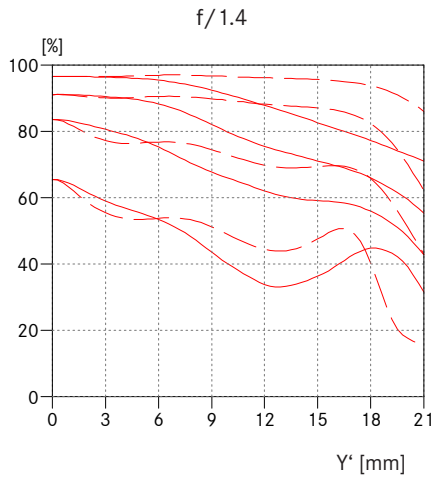


— Engineering drawing

## Technical Data

<b>Angle of view</b> (diagonal, horizontal, vertical)	75° / 65° / 46° (M8: 60° / 51° / 35°)
<b>Optical design</b>	<b>Number of lenses/groups:</b> 10 / 7 <b>Position of entrance pupil</b> (from bayonet flange): 31,9 mm <b>Focus range:</b> 0.7 m to ∞
<b>Distance setting</b>	<b>Scales:</b> Combined meter / graduation <b>Smallest object field:</b> 526 mm x 789 mm (M8: 395 mm x 592 mm) <b>Largest reproduction ratio:</b> 1 : 21,9
<b>Aperture</b>	<b>Setting / Function:</b> prefix with click-stops, half steps <b>Lowest value:</b> 16
<b>Bayonet</b>	Leica M quick-change bayonet
<b>Lens hood</b>	External thread with stop for screw on lens hood (included)
<b>Filter mount</b>	E49
<b>Dimensions and weight</b>	<b>Length:</b> approx. 81 mm / 67 mm (with / without lens hood) <b>Largest diameter:</b> approx. 61 mm <b>Weight:</b> approx. 440 g

— MTF-graphs

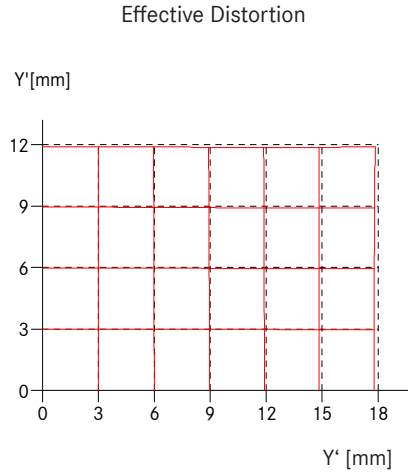
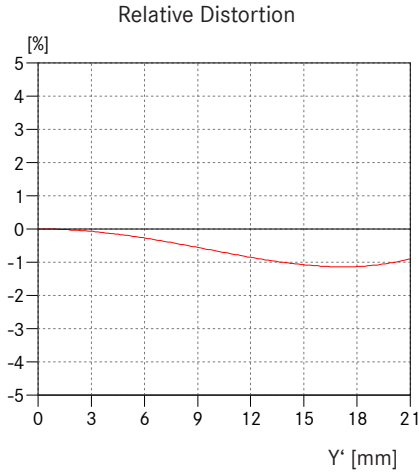


The MTF is indicated at full aperture, at f/2,8 and f/5,6 at long taking distances (infinity). Shown is the contrast in percentage for 5, 10, 20 and 40 lp/mm across the height of the 35 mm film format, for tangential (dotted line) and sagittal (solid line) structures, in white light. The 5 and 10 lp/mm 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.

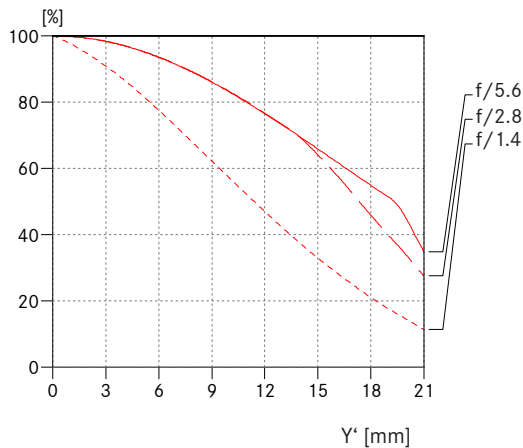
— tangential structures  
 - - - sagittal structures



## — 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 21.6 mm is the radial distance between the edge and the middle of the image field for the 24 mm x 36 mm format. 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 towards the edges of the image field. The graph shows the percentage lost of illumination over the image height. 100% means no vignetting.



## — Depth of field table

		Aperture Stop								Magnification
		1,4	2,0	2,8	4,0	5,6	8,0	11,0	16,0	
Distance Setting [m]	0,7	0,676 - 0,726	0,668 - 0,736	0,656 - 0,751	0,639 - 0,775	0,618 - 0,811	0,589 - 0,871	0,557 - 0,961	0,511 - 1,165	1/21,9
	0,8	0,769 - 0,834	0,758 - 0,848	0,742 - 0,869	0,718 - 0,903	0,692 - 0,952	0,655 - 1,038	0,615 - 1,172	0,559 - 1,503	1/25,5
	1	0,950 - 1,056	0,933 - 1,079	0,908 - 1,114	0,874 - 1,172	0,833 - 1,260	0,778 - 1,422	0,719 - 1,697	0,641 - 2,529	1/32,6
	1,2	1,127 - 1,284	1,102 - 1,318	1,068 - 1,378	1,020 - 1,464	0,963 - 1,607	0,889 - 1,886	0,812 - 2,419	0,711 - 4,648	1/39,6
	1,5	1,386 - 1,636	1,347 - 1,694	1,295 - 1,787	1,224 - 1,948	1,141 - 2,217	1,036 - 2,802	0,931 - 4,209	0,799 - 28,68	1/50,2
	2	1,798 - 2,255	1,732 - 2,370	1,645 - 2,560	1,530 - 2,913	1,400 - 3,574	1,243 - 5,448	1,092 - 16,21	0,911 - ∞	1/67,9
	3	2,560 - 3,628	2,426 - 3,941	2,255 - 4,512	2,040 - 5,769	1,810 - 9,220	1,552 - 98,2	1,318 - ∞	1,060 - ∞	1/103,3
	5	3,873 - 7,074	3,570 - 8,399	3,205 - 11,57	2,782 - 26,8	2,380 - ∞	1,938 - ∞	1,584 - ∞	1,219 - ∞	1/174
	∞	16,78 - ∞	12,18 - ∞	8,714 - ∞	6,119 - ∞	4,388 - ∞	3,089 - ∞	2,263 - ∞	1,575 - ∞	1/∞

