



# LEICA **APO ELMAR-S** 180 mm f/3.5 / CS

Technical Data.



Illustration 1:2

## TECHNICAL DATA

|  |  |
|--|--|
| <b>Order no.</b>                                       | 11071 (CS: 11053)  |
| <b>Image angle</b><br>(diagonal, horizontal, vertical) | approx. 17° / 14° / 10°, corresponds to approx. 144 mm focal length in 35 mm format  |
| <b>Optical design</b>                                  |  |
| Number of lenses / groups                              | 9 / 7  |
| Entrance pupil   | infinity: 16.75 mm (behind bayonet in incident light direction),<br>close focus limit: 37.43 mm (behind bayonet in incident light direction) |
| Focusing range   | 1,5 m to ∞   |
| <b>Distance setting</b>                                |  |
| Scales   | Combined meter/feet graduation   |
| Smallest object field                                  | 203 mm × 304 mm  |
| Largest reproduction ratio                             | 1 : 6,8  |
| <b>Aperture</b>  |  |
| Setting / Function                                     | Electronically controlled diaphragm, set using setting/<br>selection dial on camera, including half values                                   |
| Lowest value   | 32   |
| <b>Bayonet</b>   | Leica S bayonet  |
| <b>Filter mount / Lens hood</b>                        | External bayonet for lens hood (included), internal thread for<br>E72 filter, filter mount does not rotate                                   |
| <b>Dimensions and weight</b>                           |  |
| Length to bayonet mount                                | approx. 151 / 232 mm (without / with lens hood)  |
| Largest diameter                                       | approx. 88 / 96,6 mm (without / with lens hood)  |
| Weight   | approx. 1150 / 1300 g (without / with central shutter)   |



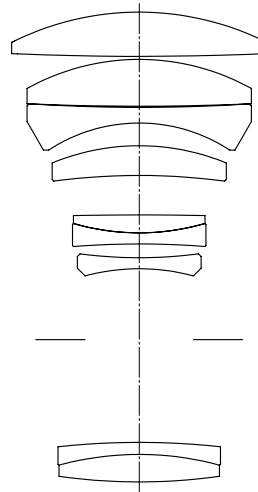
# LEICA **APO ELMAR-S** 180 mm f/3.5 / CS

ENGINEERING DRAWING



Illustration 1:2

LENS SHAPE



The extremely high performance offered by the APO Elmar-S 180 mm f/3.5 makes it an exceptional lens, even when compared to other Leica S-System lenses. With its distinctive telephoto character and very fast initial aperture, it is an invaluable asset for portrait photography, and is also an ideal lens for close-up work, thanks to its close focusing limit of just 1.5 metres (~5 ft).

Suggest change above to Distortion, vignetting or chromatic aberration will not be an issue with this lens, as a result of its elaborate design comprising nine lens elements in seven groups.

Six of these nine lenses are manufactured from glasses with anomalous partial dispersion, and two of these also possess particularly low dispersion characteristics. Thanks to the incorporation of these lenses, Leica's specialists have achieved apochromatic correction with a very well corrected secondary spectrum and almost negligible chromatic aberration. Internal focusing ensures not only that the exceptional imaging performance of this lens remains practically constant throughout its entire focusing range, but also guarantees ideal weight distribution and superior handling of this weather- and dust-sealed lens.

The imaging performance of the APO Elmar-S 180 mm f/3.5, and its extremely high, corner-to-corner contrast, sets entirely new standards, and not only in this camera class. At the same time, its performance remains absolutely constant at all apertures and distances – stopping down with this lens is only really necessary for exposure control and creating greater depth of field. As a result, this lens offers an almost countless range of creative opportunities.



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Lens with lens hood, illustration 1:2



Lens hood in transport position, illustration 1:2

## SCOPE OF DELIVERY

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Lens cover S (Order no. 16018), Rear lens cover (Order no. 16020),  
Lens pouch (Order no. 439-606.102-000), Lens hood (Order no. 12400)

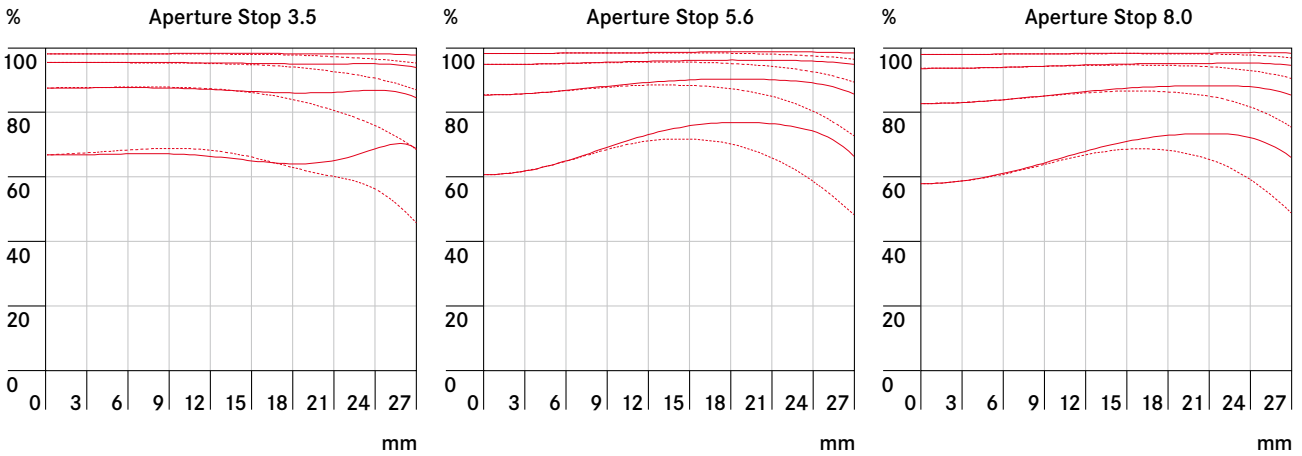
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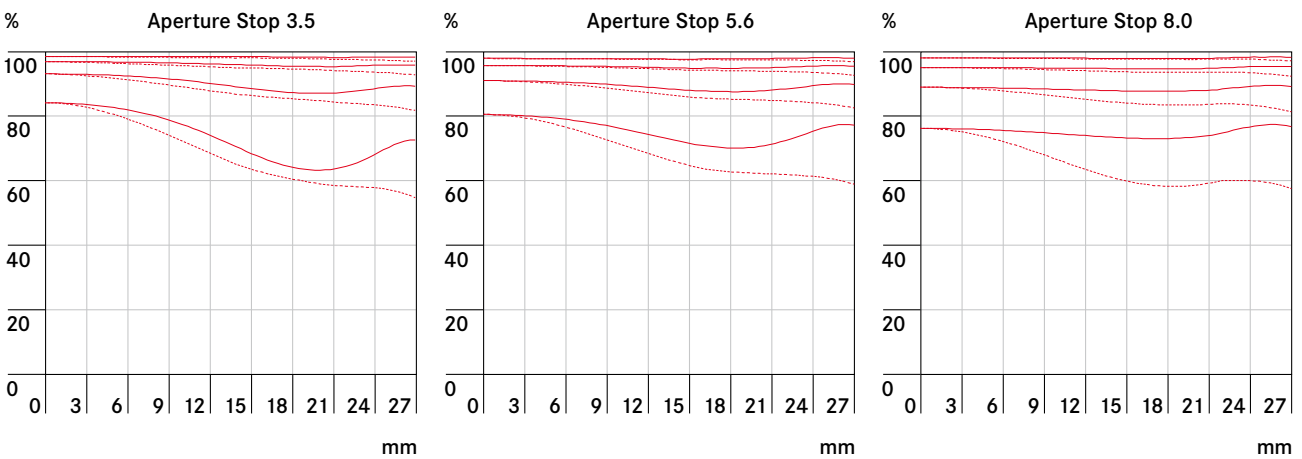
# LEICA APO ELMAR-S 180 mm f/3.5 / CS

## MTF DIAGRAMS

### Focusing distance



### Infinity ( $\infty$ )



— Sagittal structures  
 ..... Tangential structures

## MTF GRAPHS

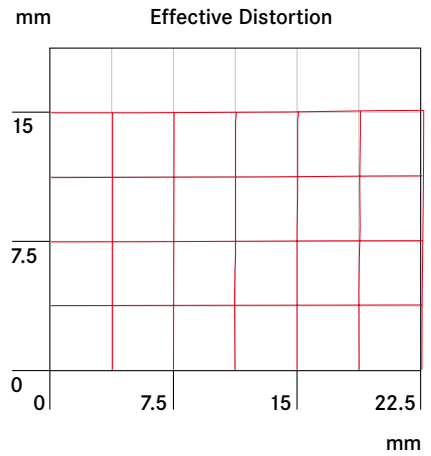
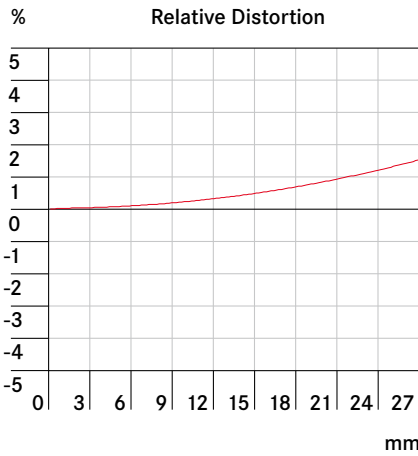
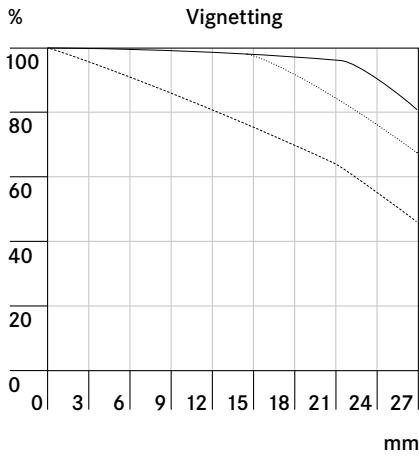
The MTF is indicated both at full aperture and at f/5.6 and f/8 at long taking distances (infinity). Shown is the contrast in percentage for 5, 10, 20 and 40 lp/mm across the height of the 35 mm film format, for tangential (dotted line) and sagittal (solid line) structures, in white light. The 5 and 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.



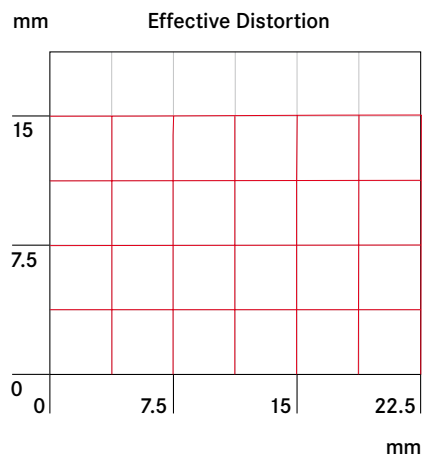
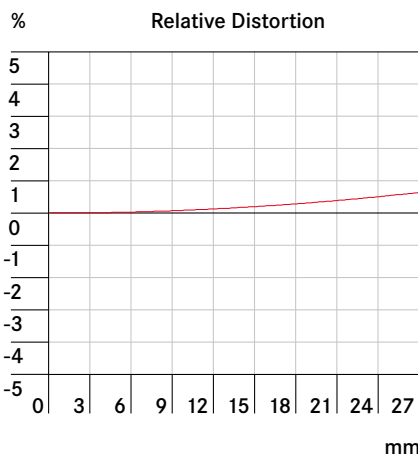
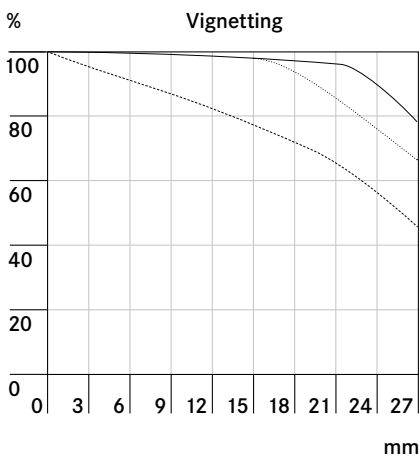
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## VIGNETTING-/DISTORTION DIAGRAM

Focusing distance



Infinity ( $\infty$ )



..... 3.5  
 ..... 5.6  
 ——— 8.0

### 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 27.04 mm is the radial distance between the edge and the middle of the image field for the format 30 mm x 45 mm. 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.



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DEPTH OF FIELD TABLE

| ∞ feet<br>∞ m | Aperture Stop |               |               |               |                |               |               |               | Magnification |
|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|
|               | 3,5           | 4             | 5,6           | 8             | 11             | 16            | 22            | 32            |               |
| 1,5           | 1,493 - 1,507 | 1,492 - 1,508 | 1,489 - 1,511 | 1,485 - 1,515 | 1,479 - 1,521  | 1,470 - 1,531 | 1,459 - 1,543 | 1,446 - 1,559 | 1/2,12        |
| 1,7           | 1,691 - 1,709 | 1,690 - 1,710 | 1,686 - 1,714 | 1,680 - 1,720 | 1,673 - 1,728  | 1,661 - 1,741 | 1,647 - 1,757 | 1,628 - 1,779 | 1/2,46        |
| 2             | 1,987 - 2,013 | 1,986 - 2,014 | 1,980 - 2,020 | 1,972 - 2,029 | 1,962 - 2,040  | 1,945 - 2,058 | 1,925 - 2,081 | 1,897 - 2,116 | 1/3,42        |
| 2,5           | 2,480 - 2,521 | 2,477 - 2,523 | 2,468 - 2,532 | 2,455 - 2,547 | 2,439 - 2,564  | 2,412 - 2,595 | 2,380 - 2,632 | 2,334 - 2,692 | 1/4,33        |
| 3             | 2,970 - 3,030 | 2,967 - 3,034 | 2,954 - 3,048 | 2,934 - 3,069 | 2,910 - 3,095  | 2,872 - 3,141 | 2,826 - 3,197 | 2,757 - 3,290 | 1/5,23        |
| 4             | 3,95 - 4,06   | 3,94 - 4,06   | 3,92 - 4,09   | 3,88 - 4,13   | 3,84 - 4,18    | 3,77 - 4,26   | 3,69 - 4,37   | 3,57 - 4,55   | 1/6,12        |
| 5             | 4,91 - 5,09   | 4,91 - 5,10   | 4,87 - 5,14   | 4,81 - 5,20   | 4,75 - 5,28    | 4,64 - 5,42   | 4,52 - 5,60   | 4,33 - 5,92   | 1/7,84        |
| 7             | 6,83 - 7,18   | 6,81 - 7,20   | 6,74 - 7,28   | 6,63 - 7,41   | 6,50 - 7,58    | 6,30 - 7,87   | 6,07 - 8,26   | 5,73 - 8,99   | 1/10,4        |
| 10            | 9,65 - 10,37  | 9,61 - 10,42  | 9,47 - 10,60  | 9,26 - 10,87  | 9,01 - 11,24   | 8,62 - 11,92  | 8,19 - 12,84  | 7,57 - 14,74  | 1/14,5        |
| 20            | 18,63 - 21,58 | 18,49 - 21,78 | 17,95 - 22,58 | 17,19 - 23,91 | 16,33 - 25,80  | 15,08 - 29,72 | 13,80 - 36,34 | 12,10 - 57,86 | 1/22,8        |
| 50            | 42,19 - 61,36 | 41,45 - 63,00 | 38,80 - 70,30 | 35,40 - 85,13 | 31,91 - 115,60 | 27,40 - 286,8 | 23,43 - ∞     | 18,88 - ∞     | 1/31,1        |
| ∞             | 268,3 - ∞     | 240,8 - ∞     | 172,0 - ∞     | 120,4 - ∞     | 87,59 - ∞      | 60,23 - ∞     | 43,81 - ∞     | 30,13 - ∞     | 1/55,9        |



Set distance [m]