

Medium Format Lens Tests

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Below are the results of some tests of medium format (6x6cm, 6x7cm, and 6x9cm) film camera lenses. The best way to test a lens would be to use an MTF measurement setup like the Zeiss K8, but since this is not an option for me, I made test chart images and evaluated negatives with a microscope. Of course, one has to keep in mind that all these tests test the whole system, from focusing to development procedures. To get any meaningful data on one component of this system like the lens, one needs to be very diligent in keeping everything else as constant as possible. Possible error sources range from focusing errors, rangefinder alignment, parallelism of the object, lens, and film planes, shutter vibration, to development temperature and agitation. In addition, numbers from different test setups should not be compared. Medium format roll film cameras are especially prone to problems with film flatness, as one can see in some of the results below for older medium format folders where the center has worse resolution than the corners or an intermediate position, likely due to bulging of the film. The bulging of roll film and the possible countermeasures of the camera manufacturers are also something to keep in mind when trying to check focus with a ground glass. Examples are the Super-Ikontas where the film gate opening is in front of the film guide rails, allowing the film to bulge forward, the Certo Six where the pressure plate has a raised rim and a sunk area to allow the film bulge backward, or the Olympus Six that employs spring loaded film tensioners (“film plane corrector”) on both the film spool and the take up spool to keep the film taught. Especially older lenses might also show some focal plane shift upon stopping down due to zonal spherical aberration – a good indicator is a reduced resolution one or two stops down from wide open, e.g. a lower resolution at f/4 compared to f/3.5.

My present test setup is the following: As test object I chose the patterns of the Norman Koren lens test chart (<http://www.normankoren.com/Tutorials/MTF5.html>) which allows a judgement of performance at two contrast levels, 50% MTF, and 10% MTF. It is different from a pure bar chart, and gives slightly worse results in lp/mm for the 10% MTF than a standard USAF bar chart. The text at the linked web site is worth reading to understand the concept. I printed out 16 of these charts, and mounted them on a stiff 4x8 ft foam board indoors, with one chart in the center, and the remaining ones

in pairs for sagittal (radial) and tangential orientation in two corners, edges and at intermediate positions. The “Center”, “Corner”, and “Intermediate” positions used to determine the resolution values are marked in red in fig. 1.

Lighting was by 1500W of halogen lighting. I took these on 120 Kodak TMAX 100 (TMX) or Fuji Acros film at magnifications between 1: 1:28 (6x9cm) to 1:45 (6x6cm) and at an EI of 80, resulting in the following exposures: f/2.8: 1/250s, f/4: 1/125s, f/5.6: 1/60s, f/8: 1/30s, f/11: 1/15s, f16: 1/8s, f/22: ¼s, f/32: ½s. The numbers on Koren's charts are calibrated for 1:50, but since I am trying to fill the negative area, the magnification changes for each film format. After determining the size of the chart (250mm long in reality) on the negative with a caliper, I determine the actual magnification m , listed in the last column of each table, and use that as a correction factor for the numbers on the Koren chart (10, 15, 20, 30, 40, 50....200lp/mm). As an example, if my magnification is 1:40, I have to multiply the numbers read off of the chart by $40/50=0.8$. Focusing is done by a combination of the rangefinder (if available) focus, measured distance, a ground glass on the film gate, or the screen for the TLR's.

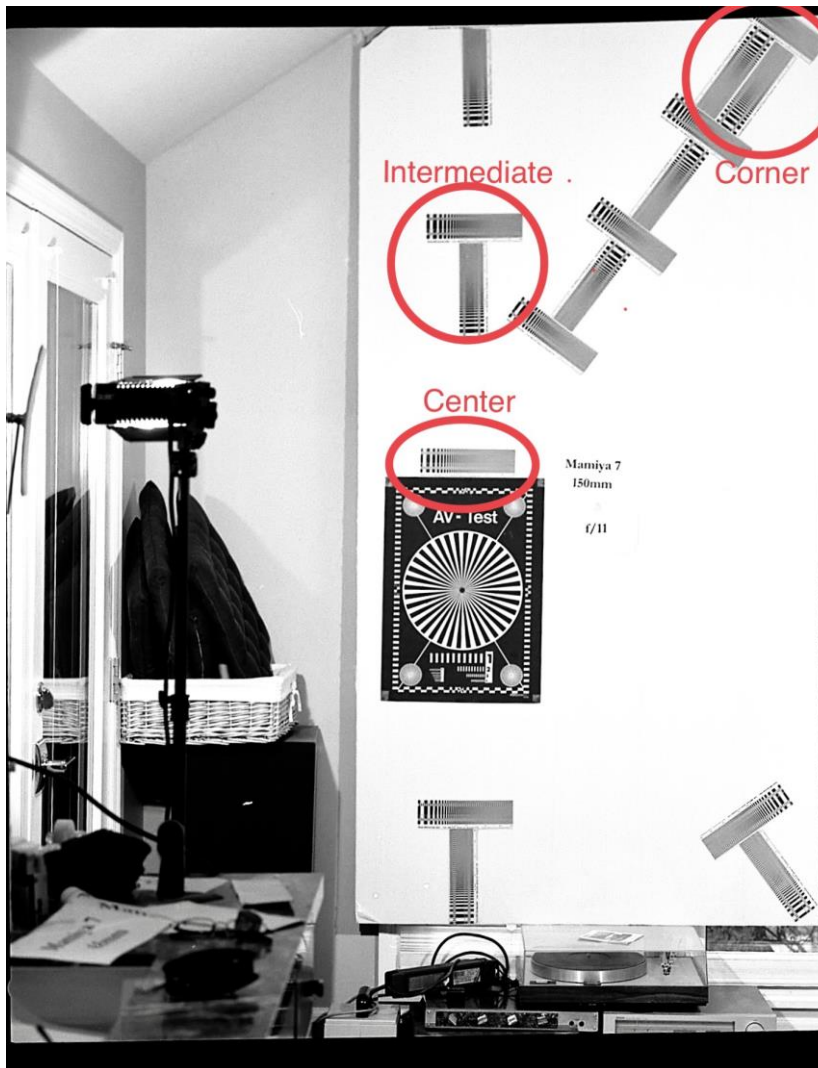


Fig. 1: One of the 6x7cm test negatives showing the setup.

an example, there are 60 numbers for an f/5.6 lens (10 values/aperture x 6 different apertures).

The values in the tables below show the resolution in lp/mm at the stated MTF's, 50% and 10%. A regular bar graph is also part of the test pattern; as a rule of thumb, the lp/mm resolution numbers for the bar graph are about 10% higher than the 10%MTF values.

For interpreting the results it is useful to have some knowledge about the general characteristics of a lens type. As an example, Tessar types, and to a lesser extent Plasmats, tend to have a slump in their MTF curve at about $\frac{1}{2}$ to $\frac{3}{4}$ of the image height, with a subsequent increase in performance. A comparison with published MTF data, where available, is also helpful in assessing the characteristics.

6x6cm: Rangefinder Folders (1)

| Camera/Lens | f stop | | Open | | 4 | | 5.6 | | 8 | | 11 | | 16 | | 22 | | 32 | | Remarks |
|---|--------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| | MTF | | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | |
| Zeiss Ikon Super Ikonta B 532/16 Carl Zeiss Jena Tessar 8cm f/2.8 | Center | | 13 | 26 | 13 | 26 | 26 | 44 | 35 | 53 | 44 | 70 | 44 | 79 | 39 | 61 | - | - | m=0.0228 (1:44) 4/3 Tessar type Front focusing uncoated |
| | Corner | sagittal | 10 | 14 | 14 | 22 | 18 | 31 | 31 | 39 | 35 | 53 | 35 | 61 | 35 | 57 | - | - | |
| | | tangential | 5 | 10 | 5 | 10 | 11 | 13 | 12 | 14 | 13 | 18 | 18 | 22 | 18 | 26 | - | - | |
| | Intermediate | sagittal | 10 | 13 | 16 | 22 | 26 | 35 | 35 | 48 | 40 | 57 | 44 | 70 | 39 | 61 | - | - | |
| tangential | | 10 | 13 | 18 | 26 | 18 | 31 | 22 | 35 | 26 | 39 | 31 | 44 | 31 | 44 | - | - | | |
| Zeiss Ikon Super Ikonta B 532/16 Zeiss-Opton Tessar 80mm f/2.8 T | Center | | 16 | 28 | 20 | 32 | 20 | 36 | 28 | 52 | 40 | 56 | 40 | 64 | 40 | 56 | - | - | m=0.025 (1:40) 4/3 Tessar type Front focusing |
| | Corner | sagittal | 8 | 12 | 8 | 12 | 8 | 12 | 8 | 12 | 8 | 12 | 14 | 20 | 24 | 28 | - | - | |
| | | tangential | 5 | 6 | 6 | 8 | 6 | 8 | 13 | 24 | 14 | 20 | 16 | 28 | 24 | 40 | - | - | |
| | Intermediate | sagittal | 16 | 24 | 13 | 16 | 12 | 20 | 14 | 20 | 20 | 28 | 28 | 40 | 32 | 56 | - | - | |
| tangential | | 24 | 32 | 16 | 20 | 20 | 32 | 28 | 36 | 32 | 44 | 36 | 56 | 36 | 52 | - | - | | |
| Zeiss Ikon Super Ikonta B 532/16 Zeiss-Opton Tessar 80mm f/2.8 T | Center | | 17 | 33 | 21 | 33 | 33 | 50 | 42 | 62 | 42 | 66 | 42 | 71 | 37 | 54 | - | - | m=0.024 (1:42) 4/3 Tessar type Front focusing |
| | Corner | sagittal | 15 | 33 | 15 | 21 | 17 | 21 | 21 | 29 | 29 | 46 | 37 | 58 | 33 | 50 | - | - | |
| | | tangential | 8 | 25 | 12 | 21 | 17 | 25 | 25 | 33 | 29 | 54 | 33 | 50 | 29 | 42 | - | - | |
| | Intermediate | sagittal | 17 | 29 | 21 | 29 | 29 | 42 | 42 | 58 | 42 | 62 | 42 | 58 | 33 | 50 | - | - | |
| tangential | | 15 | 17 | 17 | 25 | 25 | 29 | 33 | 50 | 37 | 54 | 42 | 58 | 33 | 46 | - | - | | |
| Zeiss Ikon Super-Ikonta III 531/16 Carl Zeiss Tessar 75mm f/3.5 | Center | | 26 | 43 | 19 | 43 | 39 | 60 | 39 | 69 | 47 | 78 | 43 | 69 | 34 | 52 | - | - | m=0.023 (1:43) 4/3 Tessar type Front focusing |
| | Corner | sagittal | 13 | 26 | 16 | 19 | 16 | 26 | 30 | 60 | 43 | 60 | 39 | 52 | 34 | 52 | - | - | |
| | | tangential | 16 | 26 | 16 | 19 | 14 | 16 | 17 | 26 | 26 | 34 | 30 | 39 | 30 | 39 | - | - | |
| | Intermediate | sagittal | 13 | 16 | 13 | 17 | 17 | 34 | 22 | 39 | 34 | 60 | 34 | 60 | 34 | 47 | - | - | |
| tangential | | 19 | 26 | 16 | 19 | 16 | 22 | 22 | 30 | 34 | 52 | 39 | 60 | 34 | 47 | - | - | | |
| Certo Certo Six Carl Zeiss Jena Tessar 80mm f/2.8 T | Center | | 25 | 37 | 29 | 41 | 29 | 45 | 29 | 41 | 16 | 25 | 25 | 37 | 33 | 49 | - | - | m=0.0244 (1:41) 4/3 Tessar type Unit focusing |
| | Corner | sagittal | 20 | 27 | 16 | 25 | 20 | 29 | 25 | 33 | 29 | 37 | 33 | 45 | 33 | 45 | - | - | |
| | | tangential | 16 | 27 | 15 | 25 | 16 | 25 | 25 | 33 | 20 | 29 | 29 | 37 | 25 | 33 | - | - | |
| | Intermediate | sagittal | 20 | 27 | 15 | 16 | 20 | 37 | 25 | 33 | 29 | 37 | 29 | 49 | 33 | 49 | - | - | |
| tangential | | 20 | 33 | 33 | 41 | 41 | 57 | 29 | 33 | 20 | 33 | 29 | 49 | 33 | 49 | - | - | | |
| Mamiya Mamiya 6 Automat 2 Sekor 75mm f/3.5 | Center | | 21 | 29 | 21 | 29 | 25 | 33 | 25 | 37 | 21 | 29 | 33 | 49 | 37 | 53 | - | - | m=0.0244 (1:41) 4/3 Tessar type Film plane focusing |
| | Corner | sagittal | 16 | 21 | 13 | 25 | 15 | 21 | 15 | 25 | 21 | 33 | 33 | 49 | 33 | 45 | - | - | |
| | | tangential | 25 | 33 | 16 | 29 | 21 | 29 | 25 | 37 | 25 | 40 | 25 | 37 | 29 | 41 | - | - | |
| | Intermediate | sagittal | 16 | 29 | 21 | 25 | 21 | 29 | 29 | 40 | 33 | 49 | 37 | 53 | 33 | 45 | - | - | |
| tangential | | 25 | 33 | 21 | 33 | 25 | 33 | 29 | 45 | 33 | 49 | 37 | 56 | 33 | 45 | - | - | | |

6x6cm: Rangefinder Folders (2)

| Camera/Lens | f stop | | Open | | 4 | | 5.6 | | 8 | | 11 | | 16 | | 22 | | 32 | | Remarks |
|--|--------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| | MTF | | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | |
| Fuji Photo Film Super Fujica 6 Fujinar 75mm f/3.5 | Center | | 17 | 21 | 17 | 23 | 17 | 23 | 19 | 24 | 21 | 30 | 30 | 38 | 34 | 51 | - | - | m=0.0244 (1:42.4) 4/3 Tessar type Unit focusing |
| | Corner | sagittal | 3 | 4 | 3 | 5 | 5 | 7 | 13 | 21 | 15 | 17 | 21 | 30 | 30 | 47 | - | - | |
| | | tangential | 13 | 17 | 13 | 17 | 9 | 13 | 13 | 17 | 17 | 26 | 21 | 30 | 26 | 34 | - | - | |
| | Intermediate | sagittal | 17 | 21 | 17 | 23 | 21 | 26 | 26 | 30 | 26 | 30 | 30 | 43 | 34 | 51 | - | - | |
| tangential | | 17 | 21 | 17 | 23 | 21 | 30 | 21 | 30 | 21 | 26 | 26 | 43 | 34 | 47 | - | - | | |
| Olympus Six RIIa D. Zuiko F.C. 75mm f/3.5 | Center | | 29 | 46 | 37 | 50 | 37 | 54 | 33 | 50 | 37 | 54 | 42 | 58 | 42 | 58 | - | - | m=0.025 (1:40) 4/3 Tessar type Front focusing |
| | Corner | sagittal | 15 | 25 | 15 | 25 | 15 | 25 | 17 | 29 | 21 | 29 | 29 | 37 | 33 | 46 | - | - | |
| | | tangential | 12 | 25 | 17 | 25 | 17 | 25 | 29 | 37 | 33 | 42 | 29 | 42 | 29 | 37 | - | - | |
| | Intermediate | sagittal | 21 | 33 | 21 | 25 | 33 | 42 | 42 | 58 | 46 | 66 | 46 | 62 | 42 | 58 | - | - | |
| tangential | | 29 | 37 | 33 | 42 | 33 | 50 | 42 | 54 | 42 | 66 | 42 | 58 | 42 | 54 | - | - | | |
| Barnet Ensign Ensign Autorange 220 Ensar 75mm f/4.5 | Center | | 17 | 25 | - | - | 20 | 30 | 25 | 42 | 21 | 34 | 30 | 38 | 34 | 42 | - | - | m=0.025 (1:40) 4/3 Tessar type Unit focusing |
| | Corner | sagittal | 17 | 25 | - | - | 15 | 21 | 25 | 38 | 30 | 38 | 30 | 42 | 30 | 38 | - | - | |
| | | tangential | 17 | 21 | - | - | 13 | 17 | 21 | 34 | 25 | 34 | 25 | 34 | 25 | 34 | - | - | |
| | Intermediate | sagittal | 20 | 25 | - | - | 17 | 21 | 25 | 38 | 25 | 30 | 30 | 38 | 30 | 42 | - | - | |
| tangential | | 20 | 25 | - | - | 13 | 17 | 30 | 42 | 30 | 42 | 34 | 47 | 38 | 51 | - | - | | |
| Barnet Ensign Ensign Commando Ensar 75mm f/3.5 | Center | | 12 | 25 | 16 | 33 | 16 | 25 | 25 | 33 | 33 | 53 | 37 | 62 | 37 | 57 | 29 | 37 | m=0.0236 (1:42) 4/3 Tessar type Film plane focusing uncoated |
| | Corner | sagittal | 5 | 8 | 5 | 8 | 8 | 12 | 8 | 12 | 8 | 12 | 15 | 21 | 29 | 39 | 25 | 29 | |
| | | tangential | 8 | 12 | 5 | 8 | 8 | 12 | 8 | 12 | 8 | 12 | 12 | 16 | 21 | 29 | 16 | 21 | |
| | Intermediate | sagittal | 25 | 41 | 29 | 37 | 29 | 37 | 37 | 45 | 41 | 57 | 41 | 57 | 37 | 49 | 25 | 33 | |
| tangential | | 21 | 33 | 25 | 37 | 29 | 37 | 29 | 41 | 33 | 45 | 33 | 49 | 33 | 41 | 25 | 33 | | |
| Shanghai Camera Seagull 203 S-111-02 75mm f/3.5 | Center | | 28 | 40 | 20 | 40 | 28 | 35 | 32 | 56 | 32 | 56 | 32 | 56 | 32 | 44 | - | - | m=0.0248 (1:40) 3/3 Triplet type Unit focusing |
| | Corner | sagittal | 12 | 20 | 10 | 14 | 14 | 20 | 14 | 16 | 16 | 20 | 20 | 32 | 24 | 36 | - | - | |
| | | tangential | 8 | 12 | 6 | 10 | 10 | 16 | 14 | 24 | 16 | 20 | 20 | 28 | 14 | 24 | - | - | |
| | Intermediate | sagittal | 16 | 32 | 14 | 28 | 16 | 24 | 24 | 32 | 28 | 44 | 32 | 48 | 32 | 40 | - | - | |
| tangential | | 12 | 28 | 12 | 20 | 16 | 24 | 20 | 32 | 28 | 40 | 28 | 40 | 28 | 32 | - | - | | |
| KM3 Искра (KMZ Iskra) Индустар-58 (Industar-58) 75mm f/3.5 | Center | | 16 | 26 | 18 | 35 | 35 | 57 | 35 | 70 | 35 | 53 | 35 | 61 | 39 | 61 | - | - | m=0.0228 (1:44) 4/3 Tessar type Unit focusing |
| | Corner | sagittal | 9 | 17 | 9 | 14 | 12 | 18 | 16 | 31 | 16 | 31 | 26 | 35 | 35 | 48 | - | - | |
| | | tangential | 16 | 26 | 18 | 26 | 22 | 35 | 26 | 39 | 26 | 35 | 22 | 26 | 22 | 26 | - | - | |
| | Intermediate | sagittal | 14 | 18 | 16 | 22 | 22 | 31 | 26 | 35 | 26 | 39 | 26 | 35 | 35 | 53 | - | - | |
| tangential | | 22 | 31 | 22 | 26 | 31 | 39 | 39 | 61 | 44 | 57 | 31 | 39 | 35 | 53 | - | - | | |

6x6cm: TLR Cameras

| Camera/Lens | f stop | | Open | | 4 | | 5.6 | | 8 | | 11 | | 16 | | 22 | | 32 | | Remarks |
|--|--------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | MTF | | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | |
| Rollei Fototechnik Rolleiflex 2.8 GX HFT Planar 80mm f/2.8 | Center | | 27 | 53 | 36 | 63 | 45 | 94 | 49 | 98 | 50 | 89 | 45 | 71 | 36 | 63 | - | - | m=0.022 (1:45) |
| | Corner | sagittal | 27 | 53 | 36 | 63 | 45 | 71 | 45 | 89 | 45 | 76 | 45 | 67 | 36 | 54 | - | - | |
| | | tangential | 36 | 53 | 31 | 54 | 36 | 58 | 36 | 54 | 36 | 58 | 36 | 58 | 36 | 45 | - | - | |
| | Intermediate | sagittal | 27 | 40 | 36 | 67 | 40 | 80 | 54 | 89 | 45 | 76 | 40 | 71 | 36 | 54 | - | - | |
| tangential | | 27 | 49 | 36 | 67 | 40 | 80 | 40 | 80 | 40 | 71 | 36 | 63 | 31 | 54 | - | - | | |
| Rollei Fototechnik Rolleiflex 2.8 GX Edition HFT Planar 80mm f/2.8 | Center | | 45 | 80 | 36 | 58 | 45 | 80 | 54 | 80 | 54 | 80 | 40 | 71 | 40 | 58 | - | - | 5/4 Planar type |
| | Corner | sagittal | 36 | 63 | 45 | 63 | 45 | 76 | 49 | 80 | 54 | 71 | 45 | 67 | 40 | 54 | - | - | |
| | | tangential | 27 | 45 | 31 | 45 | 36 | 54 | 36 | 54 | 36 | 54 | 40 | 54 | 36 | 45 | - | - | |
| | Intermediate | sagittal | 27 | 40 | 40 | 58 | 36 | 54 | 45 | 67 | 45 | 80 | 54 | 71 | 40 | 54 | - | - | |
| tangential | | 36 | 54 | 40 | 63 | 45 | 71 | 54 | 80 | 54 | 76 | 45 | 63 | 36 | 54 | - | - | | |
| Mamiya C 330 S Mamiya-Sekor 55mm f/4.5 | Center | | 46 | 88 | - | - | 42 | 79 | 46 | 93 | 51 | 83 | 47 | 74 | 37 | 56 | - | - | m=0.022 (1:45) |
| | Corner | sagittal | 37 | 56 | - | - | 46 | 65 | 46 | 79 | 56 | 83 | 51 | 74 | 46 | 56 | - | - | |
| | | tangential | 32 | 42 | - | - | 37 | 46 | 37 | 56 | 37 | 46 | 37 | 51 | 28 | 46 | - | - | |
| | Intermediate | sagittal | 32 | 46 | - | - | 32 | 42 | 32 | 56 | 42 | 69 | 37 | 65 | 32 | 51 | - | - | |
| tangential | | 32 | 65 | - | - | 37 | 65 | 37 | 69 | 37 | 65 | 32 | 60 | 32 | 51 | - | - | | |
| Mamiya C 330 S Mamiya-Sekor DS 105mm f/3.5 | Center | | 40 | 70 | 40 | 65 | 50 | 80 | 50 | 80 | 40 | 70 | 40 | 65 | 40 | 60 | 40 | 55 | m=0.02 (1:50) |
| | Corner | sagittal | 35 | 45 | 25 | 40 | 35 | 45 | 45 | 70 | 40 | 70 | 45 | 70 | 40 | 55 | 40 | 60 | |
| | | tangential | 25 | 40 | 25 | 40 | 30 | 50 | 40 | 55 | 40 | 60 | 40 | 65 | 40 | 50 | 40 | 50 | |
| | Intermediate | sagittal | 30 | 45 | 30 | 45 | 35 | 60 | 45 | 70 | 45 | 70 | 45 | 70 | 40 | 60 | 40 | 55 | |
| tangential | | 25 | 40 | 35 | 45 | 40 | 60 | 40 | 70 | 40 | 60 | 45 | 70 | 40 | 50 | 40 | 55 | | |
| Mamiya C 330 S Mamiya-Sekor Super 180mm f/4.5 | Center | | 20 | 40 | - | - | 50 | 80 | 50 | 85 | 50 | 80 | 45 | 70 | 40 | 60 | 35 | 45 | m=0.02 (1:50) 5/4 Ernostar type |
| | Corner | sagittal | 35 | 55 | - | - | 35 | 60 | 40 | 60 | 45 | 70 | 50 | 70 | 40 | 55 | 35 | 45 | |
| | | tangential | 25 | 35 | - | - | 25 | 40 | 40 | 50 | 35 | 50 | 35 | 50 | 30 | 45 | 30 | 40 | |
| | Intermediate | sagittal | 25 | 45 | - | - | 45 | 80 | 50 | 85 | 45 | 80 | 40 | 65 | 40 | 60 | 30 | 45 | |
| tangential | | 18 | 25 | - | - | 40 | 50 | 40 | 65 | 35 | 55 | 40 | 55 | 35 | 55 | 30 | 45 | | |

6x7cm: Cosina-Voigtländer / Fuji Rangefinder Cameras

| Camera/Lens | f stop | | Open | | 4 | | 5.6 | | 8 | | 11 | | 16 | | 22 | | 32 | | Remarks |
|--|--------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| | MTF | | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | |
| Fuji GF 670/ Fujinon 80mm f/3.5 | Center | | 43 | 64 | 43 | 79 | 57 | 86 | 43 | 64 | 43 | 64 | 36 | 61 | 36 | 50 | - | - | m=0.028 (1:35.7) 6/4 Planar type |
| | Corner | sagittal | 29 | 46 | 36 | 43 | 39 | 57 | 36 | 50 | 36 | 50 | 32 | 43 | 29 | 43 | - | - | |
| | | tangential | 21 | 36 | 29 | 36 | 29 | 39 | 32 | 43 | 29 | 43 | 29 | 39 | 29 | 36 | - | - | |
| | Intermediate | sagittal | 36 | 64 | 29 | 43 | 43 | 71 | 50 | 71 | 43 | 71 | 36 | 61 | 36 | 57 | - | - | |
| | | tangential | 29 | 43 | 29 | 46 | 36 | 64 | 43 | 71 | 36 | 64 | 32 | 50 | 29 | 43 | - | - | |
| | Center | | 41 | 64 | 43 | 64 | 43 | 71 | 36 | 57 | 36 | 57 | 36 | 54 | 32 | 50 | - | - | |
| Corner | sagittal | 21 | 29 | 21 | 29 | 21 | 36 | 29 | 39 | 36 | 46 | 36 | 50 | 36 | 50 | - | - | | |
| | tangential | 18 | 25 | 18 | 29 | 18 | 32 | 18 | 32 | 21 | 32 | 29 | 36 | 29 | 32 | - | - | | |
| Intermediate | sagittal | 36 | 57 | 36 | 61 | 36 | 57 | 43 | 71 | 49 | 71 | 43 | 64 | 32 | 46 | - | - | | |
| | tangential | 36 | 57 | 36 | 64 | 43 | 61 | 43 | 64 | 43 | 64 | 36 | 57 | 36 | 46 | - | - | | |
| Voigtländer Bessa III W 667 Color-Skopar 55mm f/4.5 | Center | | 56 | 96 | - | - | 56 | 88 | 56 | 96 | 56 | 96 | 48 | 72 | 36 | 56 | - | - | m=0.025 (1:40) 10/8 Biogon type |
| | Corner | sagittal | 24 | 36 | - | - | 24 | 28 | 32 | 40 | 36 | 48 | 40 | 56 | 36 | 56 | - | - | |
| | | tangential | 32 | 40 | - | - | 32 | 36 | 32 | 44 | 40 | 56 | 40 | 48 | 32 | 40 | - | - | |
| | Intermediate | sagittal | 56 | 88 | - | - | 48 | 64 | 56 | 88 | 56 | 84 | 48 | 72 | 40 | 56 | - | - | |
| | | tangential | 40 | 80 | - | - | 44 | 64 | 56 | 88 | 56 | 80 | 44 | 64 | 36 | 48 | - | - | |

6x7cm: Mamiya 7 II lenses

| Lens | f stop | Open | | 4 | | 5.6 | | 8 | | 11 | | 16 | | 22 | | 32 | | Remarks | |
|------------------|--------------|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------|--|
| | MTF | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | | |
| 43mm L f/4.5 | Center | | 67 | 104 | - | - | 67 | 104 | 67 | 96 | 59 | 81 | 44 | 78 | 33 | 46 | - | - | m=0.027 (1:37) 10/6 Biogon type |
| | Corner | sagittal | 37 | 67 | - | - | 41 | 78 | 37 | 59 | 44 | 67 | 44 | 56 | 30 | 48 | - | - | |
| | | tangential | 30 | 44 | - | - | 30 | 41 | 33 | 44 | 30 | 41 | 37 | 44 | 26 | 33 | - | - | |
| | Intermediate | sagittal | 33 | 74 | - | - | 67 | 104 | 61 | 104 | 59 | 89 | 44 | 67 | 30 | 48 | - | - | |
| tangential | | 52 | 96 | - | - | 52 | 96 | 52 | 96 | 52 | 81 | 44 | 67 | 33 | 52 | - | - | | |
| 50mm L f/4.5 | Center | | 57 | 100 | - | - | 57 | 86 | 64 | 100 | 57 | 86 | 43 | 71 | 36 | 57 | - | - | m=0.028 (1:35.7) 10/6 Biogon type |
| | Corner | sagittal | 39 | 62 | - | - | 43 | 57 | 43 | 54 | 43 | 64 | 39 | 57 | 32 | 43 | - | - | |
| | | tangential | 29 | 46 | - | - | 36 | 50 | 36 | 50 | 36 | 50 | 32 | 43 | 29 | 39 | - | - | |
| | Intermediate | sagittal | 21 | 36 | - | - | 43 | 71 | 57 | 75 | 57 | 79 | 39 | 64 | 39 | 50 | - | - | |
| tangential | | 36 | 50 | - | - | 50 | 79 | 46 | 79 | 50 | 79 | 43 | 61 | 36 | 50 | - | - | | |
| 65mm L f/4 | Center | | 53 | 98 | 53 | 98 | 45 | 83 | 49 | 91 | 53 | 83 | 53 | 76 | 38 | 61 | - | - | m=0.0264 (1:38) 9/5 Biogon type |
| | Corner | sagittal | 38 | 53 | 38 | 53 | 38 | 53 | 38 | 53 | 34 | 61 | 38 | 61 | 38 | 53 | - | - | |
| | | tangential | 30 | 45 | 30 | 45 | 34 | 45 | 34 | 45 | 38 | 53 | 34 | 53 | 30 | 45 | - | - | |
| | Intermediate | sagittal | 45 | 106 | 45 | 106 | 53 | 106 | 45 | 91 | 45 | 83 | 53 | 76 | 38 | 61 | - | - | |
| tangential | | 45 | 98 | 45 | 98 | 53 | 106 | 53 | 83 | 45 | 83 | 45 | 68 | 38 | 61 | - | - | | |
| 80mm L f/4 | Center | | 39 | 86 | 39 | 86 | 55 | 102 | 55 | 102 | 47 | 86 | 47 | 78 | 39 | 59 | - | - | m=0.0256 (1:39) 6/4 Plasmat type |
| | Corner | sagittal | 31 | 39 | 31 | 39 | 27 | 35 | 31 | 35 | 35 | 47 | 39 | 63 | 35 | 55 | - | - | |
| | | tangential | 16 | 23 | 16 | 23 | 14 | 20 | 14 | 20 | 20 | 27 | 31 | 43 | 31 | 43 | - | - | |
| | Intermediate | sagittal | 39 | 55 | 39 | 55 | 47 | 78 | 55 | 86 | 47 | 82 | 43 | 70 | 39 | 55 | - | - | |
| tangential | | 31 | 63 | 31 | 63 | 39 | 70 | 47 | 86 | 51 | 82 | 43 | 66 | 39 | 51 | - | - | | |
| 150mm L f/4.5 | Center | | 45 | 90 | - | - | 60 | 97 | 60 | 104 | 60 | 82 | 45 | 75 | 37 | 56 | 30 | 45 | m=0.0268 (1:37) 6/5 Sonnar/Ernostar type |
| | Corner | sagittal | 45 | 82 | - | - | 52 | 82 | 52 | 82 | 52 | 82 | 45 | 60 | 34 | 45 | 30 | 37 | |
| | | tangential | 37 | 60 | - | - | 37 | 56 | 37 | 56 | 45 | 63 | 37 | 52 | 30 | 45 | 30 | 34 | |
| | Intermediate | sagittal | 60 | 104 | - | - | 60 | 90 | 60 | 97 | 52 | 90 | 45 | 75 | 37 | 52 | 30 | 45 | |
| tangential | | 60 | 97 | - | - | 52 | 82 | 52 | 97 | 52 | 75 | 45 | 67 | 37 | 52 | 30 | 41 | | |
| 210mm L f/8 | Center | | 45 | 82 | - | - | - | - | 45 | 82 | 52 | 75 | 52 | 67 | 34 | 56 | 30 | 45 | m=0.0268 (1:37) 7/5 (Miniature Plasmat+ negative meniscus) |
| | Corner | sagittal | 34 | 41 | - | - | - | - | 34 | 41 | 34 | 52 | 45 | 60 | 34 | 45 | 30 | 41 | |
| | | tangential | 37 | 52 | - | - | - | - | 37 | 52 | 37 | 52 | 37 | 49 | 34 | 45 | 30 | 37 | |
| | Intermediate | sagittal | 45 | 67 | - | - | - | - | 45 | 67 | 52 | 67 | 45 | 60 | 37 | 56 | 30 | 45 | |
| tangential | | 52 | 90 | - | - | - | - | 52 | 90 | 52 | 82 | 45 | 60 | 37 | 56 | 26 | 37 | | |

6x9cm: Voigtländer Folders and Rangefinder Folders

| Lens | f stop | | Open | | 4 | | 5.6 | | 8 | | 11 | | 16 | | 22 | | 32 | | Remarks |
|--|---|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | MTF | | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | |
| Voigtländer Bessa Voigtar 10.5cm f/6.3 | Center | | 17 | 31 | - | - | - | - | 12 | 33 | 17 | 25 | 19 | 33 | 28 | 50 | - | - | m=0.035 (1:28.4) 3/3 Triplet type Front focusing uncoated |
| | Corner | sagittal | 17 | 28 | - | - | - | - | 17 | 33 | 19 | 33 | 28 | 47 | 28 | 44 | - | - | |
| | | tangential | 14 | 22 | - | - | - | - | 12 | 22 | 14 | 22 | 19 | 33 | 22 | 33 | - | - | |
| | Intermediate | sagittal | 11 | 22 | - | - | - | - | 14 | 22 | 17 | 22 | 22 | 31 | 25 | 44 | - | - | |
| | | tangential | 11 | 17 | - | - | - | - | 14 | 19 | 14 | 25 | 17 | 25 | 22 | 33 | - | - | |
| | Voigtländer Bessa Voigtar 11cm f/4.5 | Center | | 14 | 22 | - | - | 14 | 22 | 14 | 22 | 12 | 19 | 17 | 33 | 25 | 39 | - | |
| Corner | | sagittal | 11 | 17 | - | - | 8 | 9 | 11 | 25 | 17 | 22 | 19 | 28 | 25 | 39 | - | - | |
| | | tangential | 9 | 10 | - | - | 7 | 8 | 9 | 11 | 11 | 17 | 14 | 22 | 17 | 28 | - | - | |
| Intermediate | | sagittal | 14 | 22 | - | - | 17 | 22 | 17 | 28 | 17 | 25 | 22 | 39 | 28 | 50 | - | - | |
| | | tangential | 12 | 19 | - | - | 14 | 17 | 14 | 25 | 19 | 25 | 22 | 25 | 22 | 39 | - | - | |
| Voigtländer Rangefinder Bessa Helomar 10.5cm f/3.5 | | Center | | 22 | 44 | 25 | 42 | 20 | 39 | 17 | 25 | 17 | 33 | 31 | 47 | 28 | 47 | - | - |
| | Corner | sagittal | 8 | 10 | 10 | 11 | 10 | 12 | 10 | 11 | 14 | 17 | 19 | 25 | 28 | 39 | - | - | |
| | | tangential | 11 | 33 | 11 | 33 | 12 | 31 | 22 | 33 | 25 | 33 | 28 | 39 | 22 | 33 | - | - | |
| | Intermediate | sagittal | 8 | 22 | 9 | 25 | 14 | 33 | 14 | 25 | 22 | 33 | 31 | 50 | 33 | 44 | - | - | |
| | | tangential | 19 | 33 | 17 | 28 | 17 | 31 | 28 | 42 | 22 | 33 | 28 | 44 | 33 | 47 | - | - | |
| | Voigtländer Rangefinder Bessa Skopar 10.5cm f/3.5 | Center | | 11 | 22 | 10 | 19 | 11 | 22 | 17 | 33 | 25 | 36 | 25 | 42 | 28 | 44 | - | - |
| Corner | | sagittal | 5 | 6 | 5 | 6 | 5 | 6 | 8 | 10 | 9 | 11 | 10 | 12 | 17 | 22 | - | - | |
| | | tangential | 11 | 17 | 9 | 11 | 8 | 17 | 19 | 25 | 17 | 25 | 11 | 17 | 22 | 28 | - | - | |
| Intermediate | | sagittal | 10 | 11 | 9 | 11 | 11 | 17 | 11 | 22 | 17 | 28 | 22 | 36 | 28 | 47 | - | - | |
| | | tangential | 11 | 25 | 11 | 22 | 17 | 31 | 19 | 28 | 22 | 33 | 19 | 25 | 25 | 42 | - | - | |
| Voigtländer Bessa II Color-Skopar 105mm f/3.5 | | Center | | 11 | 23 | 14 | 28 | 11 | 28 | 23 | 43 | 28 | 51 | 28 | 43 | 23 | 40 | - | - |
| | Corner | sagittal | 20 | 28 | 20 | 28 | 20 | 34 | 28 | 45 | 28 | 40 | 26 | 34 | 23 | 34 | - | - | |
| | | tangential | 11 | 23 | 14 | 26 | 10 | 11 | 11 | 17 | 11 | 17 | 17 | 23 | 14 | 23 | - | - | |
| | Intermediate | sagittal | 8 | 11 | 8 | 11 | 8 | 11 | 11 | 20 | 20 | 31 | 23 | 34 | 23 | 43 | - | - | |
| | | tangential | 28 | 45 | 28 | 45 | 28 | 45 | 34 | 51 | 21 | 40 | 34 | 51 | 28 | 43 | - | - | |
| | Voigtländer Bessa II Color-Heliar 105mm f/3.5 | Center | | 7 | 8 | 8 | 11 | 8 | 13 | 10 | 14 | 11 | 14 | 11 | 20 | 20 | 34 | - | - |
| Corner | | sagittal | 7 | 8 | 8 | 11 | 8 | 13 | 10 | 14 | 11 | 14 | 11 | 20 | 20 | 34 | - | - | |
| | | tangential | 23 | 28 | 17 | 26 | 26 | 34 | 26 | 34 | 28 | 40 | 23 | 37 | 23 | 34 | - | - | |
| Intermediate | | sagittal | 10 | 17 | 8 | 11 | 14 | 23 | 14 | 28 | 28 | 45 | 26 | 40 | 23 | 40 | - | - | |
| | | tangential | 28 | 51 | 26 | 40 | 34 | 57 | 40 | 63 | 34 | 51 | 40 | 57 | 34 | 48 | 28 | 51 | |

6x9cm: Rangefinder Folders

| Lens | f stop | | Open | | 4 | | 5.6 | | 8 | | 11 | | 16 | | 22 | | 32 | | Remarks |
|--|--------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| | MTF | | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | 50% | 10% | |
| Zeiss Ikon Super-Ikonta C 531/2 Tessar 10.5cm f/3.5 | Center | | 14 | 28 | 17 | 33 | 22 | 36 | 17 | 39 | 19 | 42 | 28 | 44 | 33 | 47 | 31 | 42 | m=0.035 (1:28.4) 4/3 Tessar type Front focusing uncoated |
| | Corner | sagittal | 11 | 19 | 14 | 19 | 19 | 25 | 17 | 19 | 19 | 31 | 22 | 36 | 33 | 44 | 33 | 42 | |
| | | tangential | 14 | 22 | 17 | 22 | 17 | 19 | 17 | 31 | 22 | 36 | 22 | 42 | 28 | 39 | 22 | 33 | |
| | Intermediate | sagittal | 14 | 28 | 14 | 28 | 19 | 36 | 19 | 44 | 28 | 42 | 28 | 44 | 33 | 55 | 31 | 44 | |
| | | tangential | 17 | 31 | 19 | 36 | 22 | 39 | 33 | 47 | 33 | 50 | 33 | 58 | 33 | 55 | 28 | 42 | |
| | Center | | 17 | 24 | 17 | 29 | 17 | 24 | 15 | 29 | 19 | 29 | 24 | 39 | 24 | 41 | 24 | 41 | |
| Corner | sagittal | 22 | 24 | 10 | 15 | 7 | 10 | 10 | 17 | 15 | 27 | 19 | 29 | 24 | 34 | 24 | 39 | | |
| | tangential | 9 | 15 | 7 | 10 | 7 | 10 | 7 | 10 | 8 | 12 | 9 | 12 | 12 | 19 | 19 | 32 | | |
| Intermediate | sagittal | 15 | 22 | 15 | 19 | 17 | 24 | 15 | 29 | 19 | 39 | 24 | 39 | 27 | 44 | 24 | 39 | | |
| | tangential | 10 | 19 | 12 | 19 | 10 | 17 | 10 | 19 | 12 | 19 | 15 | 19 | 22 | 32 | 24 | 34 | | |