

# Data Sheet

High-performance lens for infinity up to a scale of 1:5

## HR Digaron-SW float 138 mm f/6.5

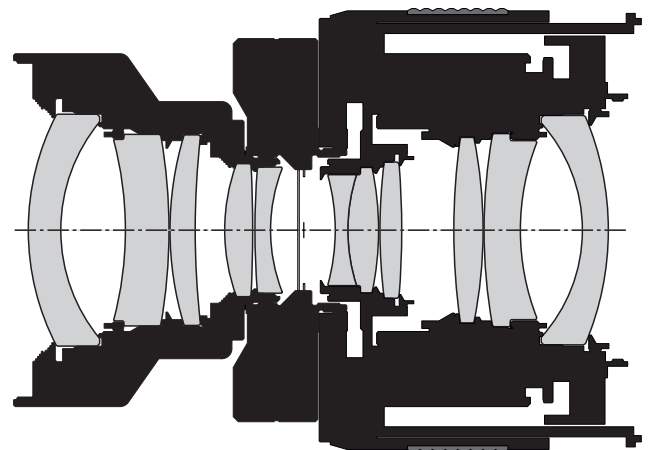
The Rodenstock **HR Digaron-SW float 138 mm f/6.5** is an exceptional sharp long focal length lens for adjustable technical cameras intended for a wide distance range from infinity up to an image scale 1:5 ( $B' = -0,2$ ). The optical design with eleven lens elements in ten groups is very complex for a prime lens. It has the highest possible resolving power extremely close to the diffraction limit. This is not only achieved across the entire field of the largest digital sensors – but also to the edge of the large 110mm image circle to allow for lens shifts and tilts. The rotation of the focusing ring automatically controls the floating elements group and all aberrations are therefore minimized throughout the whole focusing range. Even with extreme camera movements (shift and tilt) this lens provides an unprecedented sharpness to the corners as proven by the MTF curves given up to 80 lp/mm on the following pages 4 to 6. It provides negligible distortion (almost always below 1‰) and a total suppression of the chromatic aberration for perfect freedom from color fringing.

The image circle of the **HR Digaron-SW float 138 mm f/6.5** has a constant diameter of 110 mm throughout its entire image scale range. For professional technical cameras, even with the largest sensor formats, this gives ample clearance for parallel shifts for perspective corrections (avoiding or reducing converging vertical lines). This also allows swing and tilt for extended depth of field without excessive stopping down of the aperture according to the Scheimpflug rule.

Instead of a shutter, the lens has an integrated diaphragm body and is ideally suited for all camera systems with an integrated shutter or digital backs with a global shutter.

The broad focusing ring of the helical mount allows sensitive and precise focusing and automatically controls the adjustment of the floating elements group mentioned above.

The lens will not be fixed at the camera with a lens plate just behind the shutter as usual, but with a special adapter provided by the camera manufacturer. When used with a bellows camera the extension of the bellows must initially be adjusted and fixed according to the description on page 2 before focusing can be adjusted via the focusing ring of the lens.



Highest performance digital lens for all sensor formats up to 40x54 mm or 36x56 mm with a helical focusing mount that automatically controls a floating elements group.

# Rodenstock Photo Optics

a brand of the Qioptiq Photonics GmbH & Co. KG

## HR Digaron-SW float 138 mm f/6.5

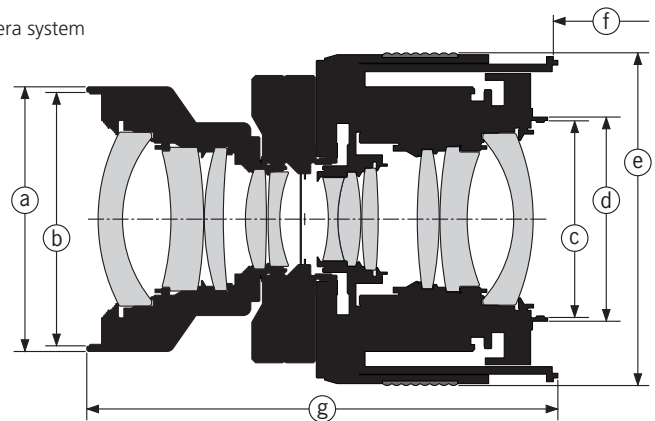
### Dimensions and weight

Push-on mount diameter (a)	Filter thread (frontal) (b)	Filter thread (rear) (c)	Rear barrel diameter (d)	Maximum diameter (e)	Free distance <sup>1)</sup> from flange plane (f)	Length (g)	Weight without adapter
70.0 mm	67 x 0.75	52 x 0.75	54.0 mm	88.0 mm	81.32 mm	124.6 mm	ca. 1400 g

<sup>1)</sup> If related to the adapter flange the free distance varies according to the camera system

The connection of the lens to different camera systems is made by specific camera adapters provided by the respective camera manufacturers. The lens has a helical focusing mount with a range from infinity up to almost 1 m. This helical mount also controls the axial shift of the floating elements group for a constant optimum correction of all lens aberrations within this range.

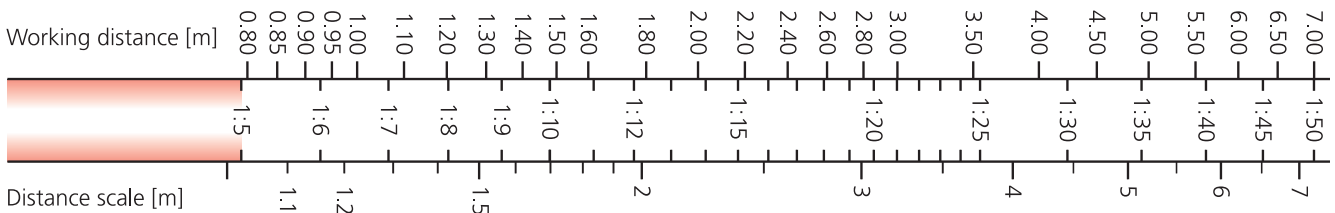
If your camera has bellows for focusing an initial procedure must be used before the helical mount can be focused: Find a distant subject ("infinity" = many kilometers away would be best), rotate the focusing ring to set its exact distance and focus with the bellows of the camera only. Mark and fix this position. If there is no subject at infinity for this procedure any shorter distances used must be measured from the image/sensor plane. From then on only the helical mount must be used for focusing.



### Outstanding image quality from infinity to close distances (about 1 meter)

With a very complex optical design and thanks to a floating elements group automatically controlled by the rotating focusing ring of the helical mount, the image quality of the new HR Digaron-SW float 138 mm f/6.5 is increased to a constant and exceptional high level very close to the diffraction limit within the whole range from infinity to almost 1 m corresponding to an image scale of 1:5 ( $\beta' = -0.2$ ). The relative long focal length of this lens results in a generous free working distance (measured from the front end of the lens barrel). The larger space between the camera lens and the motif makes it easier to work with still life subjects and to illuminate them especially from the front side without producing irritating shadows.

**Free working distance [mm]** measured from the front end of the lens for image scales up to 1:50 as mostly used in the studio



Please keep in mind that the distance values on the scale of the focusing ring are always measured from the image/sensor plane.

**Thanks to the automatically controlled floating elements the extremely high resolution all over the image circle remains constant for all distances from near to infinity.**

## HR Digaron-SW float 138 mm f/6.5

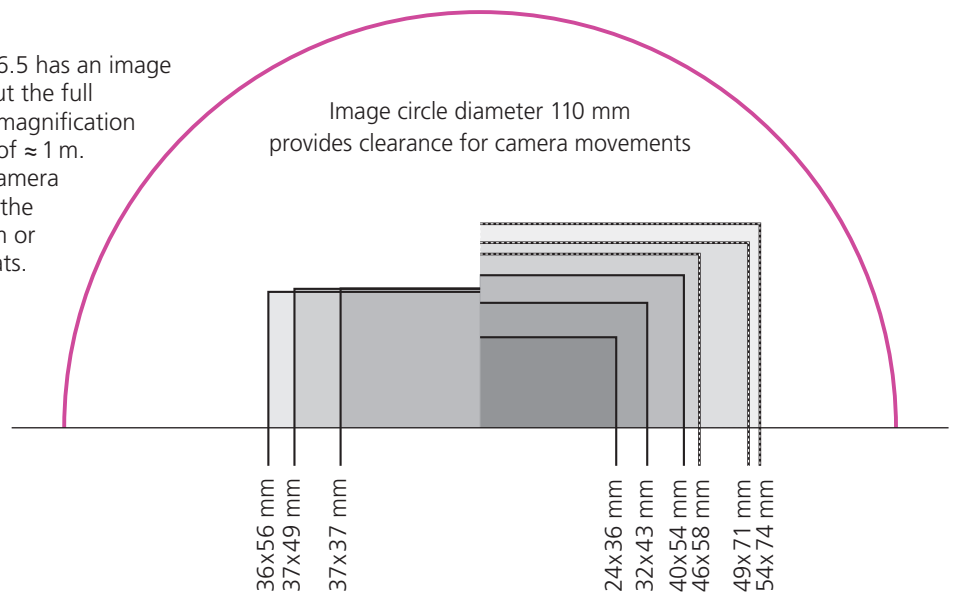
### Working apertures, image angles, image circles and movement ranges

Magnification scale given as $\beta'$	given as a ratio	Recommended working apertur	Image angle	Image circle diameter	Movement range [mm] vertical/horizontal (landscape format) <sup>2</sup>					
					24x36 mm	37x37 mm	33x44 mm	37x49 mm	36x56 mm	40x54 mm
0	1:∞	6.5	43.5°	110 mm	40 / 36	33 / 33	34 / 30	31 / 27	29 / 24	28 / 24
-0.05	1:20	6.5	41.6°	110 mm	40 / 36	33 / 33	34 / 30	31 / 27	29 / 24	28 / 24
-0.1	1:10	6.5	39.9°	110 mm	40 / 36	33 / 33	34 / 30	31 / 27	29 / 24	28 / 24
-0.2	1:5	6.5	36.8°	110 mm	40 / 36	33 / 33	34 / 30	31 / 27	29 / 24	28 / 24

<sup>2)</sup> For portrait format the given values for the maximum vertical and horizontal movements have to be swapped

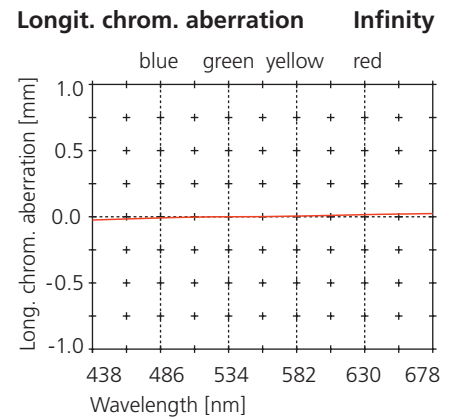
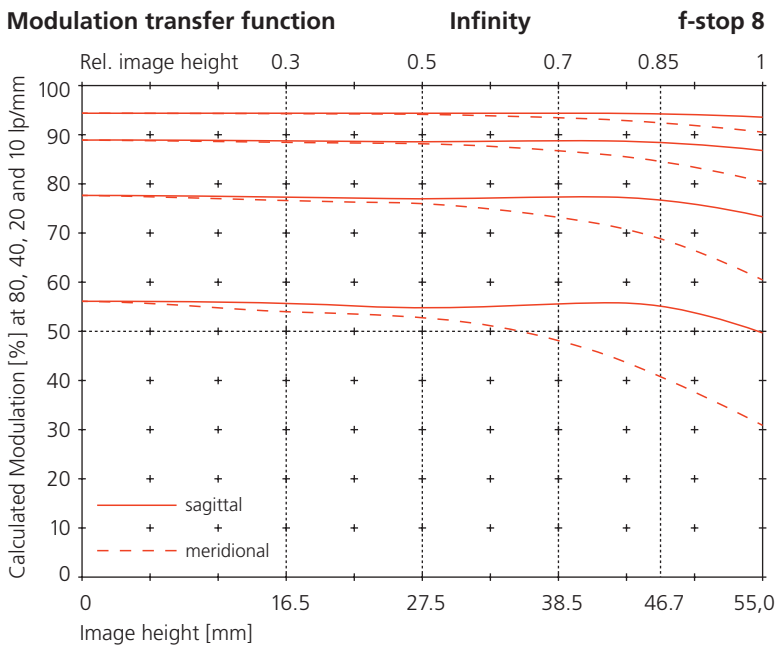
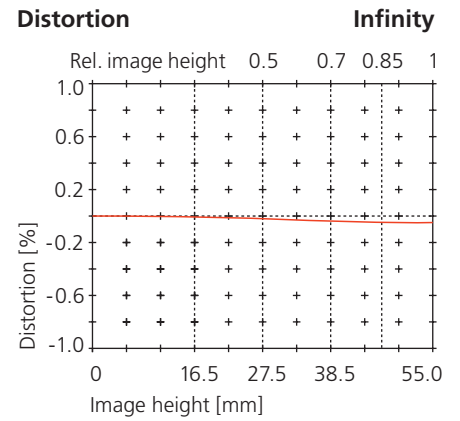
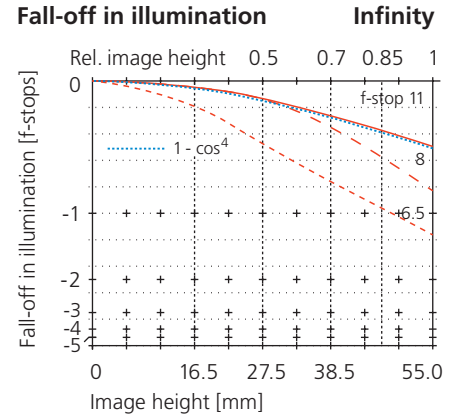
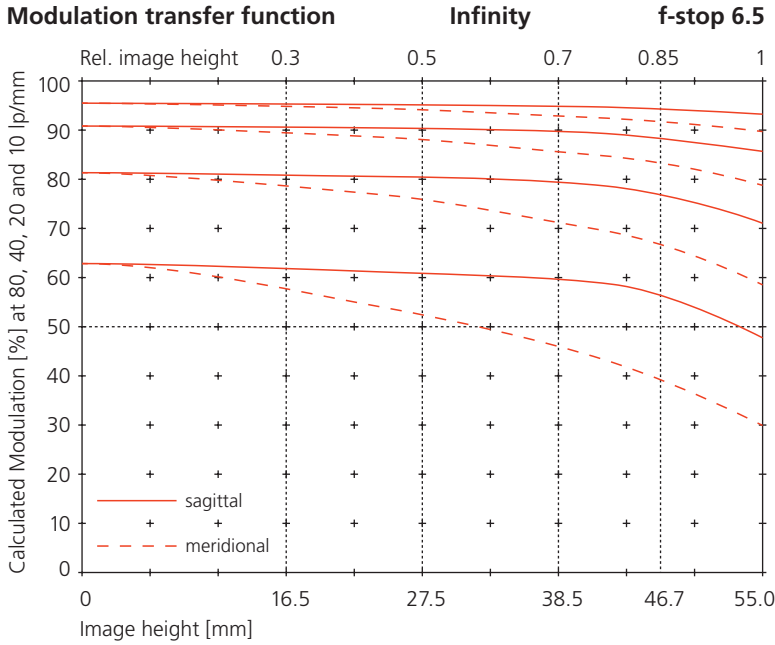
### Image circle in natural size

The HR Digaron-SW float 138 mm f/6.5 has an image circle diameter of 110 mm throughout the full focusing range from infinity up to a magnification scale of 1:5 ( $\beta' = -0,2$ ) at a distance of  $\approx 1$  m. This results in a huge clearance for camera movements (shift and tilt) even with the largest digital sensors like 36x56 mm or 40x54 mm or still larger stitch formats.



The large image circle allows parallel shift for correcting converging vertical lines as well as swing and tilt for more depth of field without blur from diffraction.

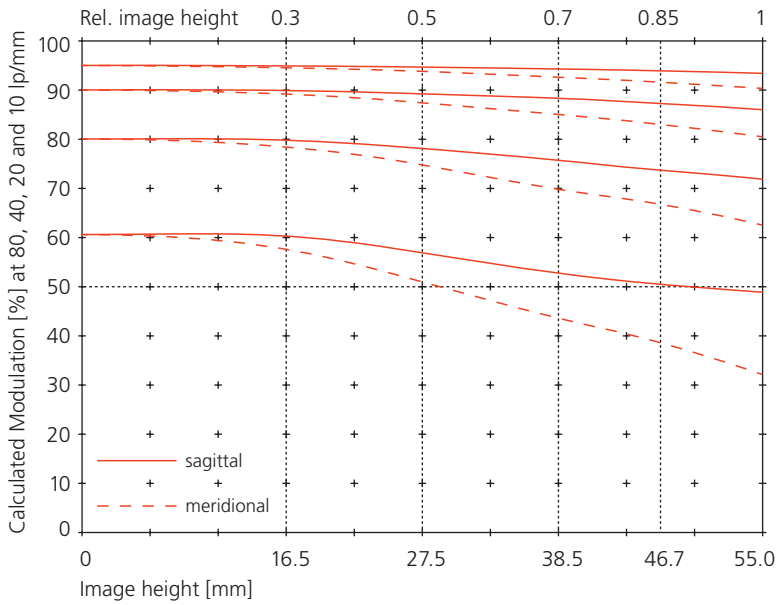
**HR Digaron-SW float 138 mm f/6.5**



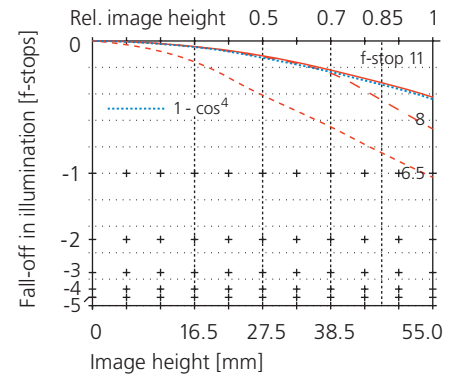
**All spatial frequencies [line pairs/mm],  
image heights [mm] and scales  
are related to the film or sensor side**

**HR Digaron-SW float 138 mm f/6.5**

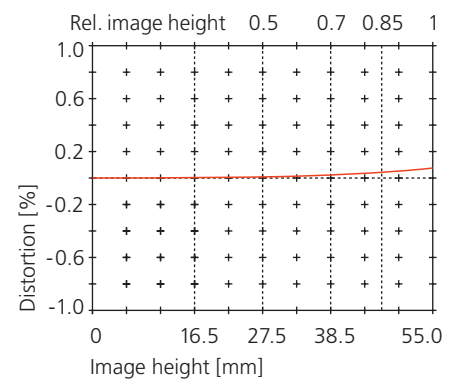
**Modulation transfer function Scale 0.1x f-stop 6.5**



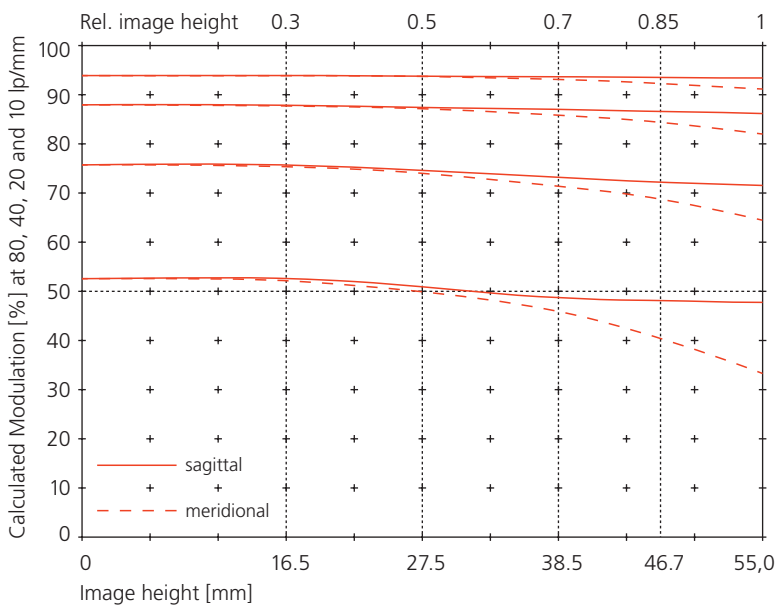
**Fall-off in illumination Scale 0.1x**



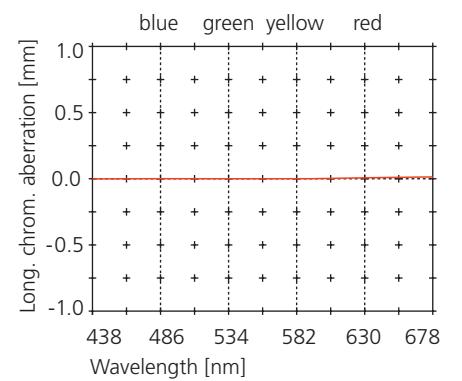
**Distortion Scale 0.1x**



**Modulation transfer function Scale 0.1x f-stop 8**



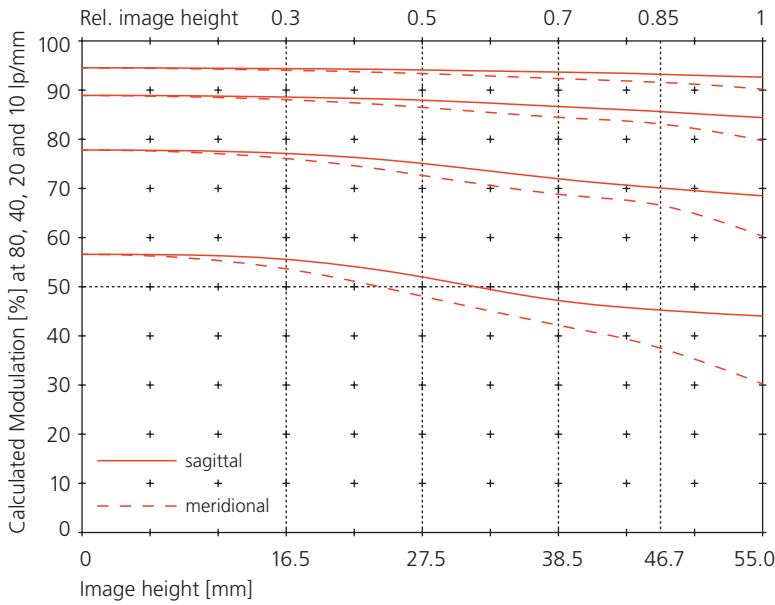
**Longit. chrom. aberration Scale 0.1x**



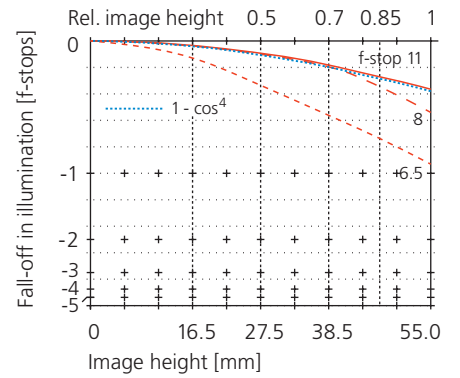
**All spatial frequencies [line pairs/mm], image heights [mm] and scales are related to the film or sensor side**

**HR Digaron-SW float 138 mm f/6.5**

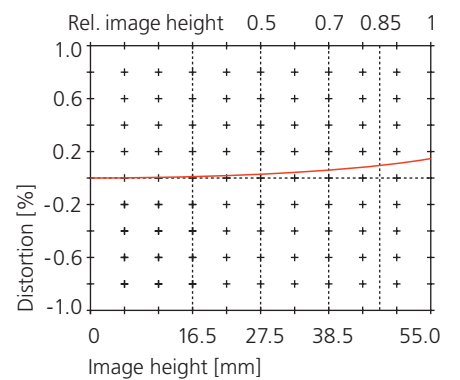
**Modulation transfer function Scale 0.2x f-stop 6.5**



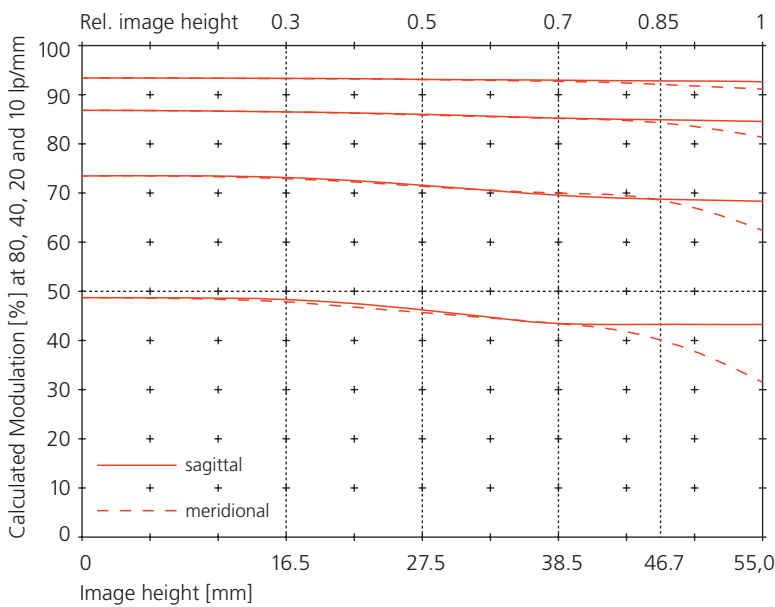
**Fall-off in illumination Scale 0.2x**



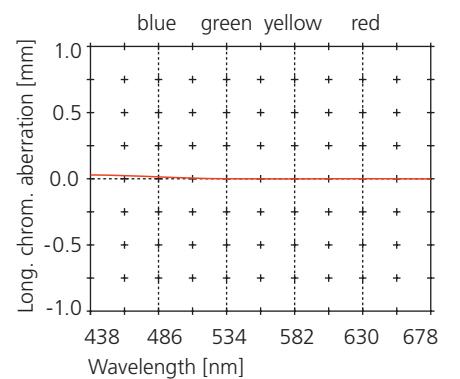
**Distortion Scale 0.2x**



**Modulation transfer function Scale 0.2x f-stop 8**



**Longit. chrom. aberration Scale 0.2x**



**All spatial frequencies [line pairs/mm], image heights [mm] and scales are related to the film or sensor side**

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