

**Determination of the resolution (complete system: camera, lens, film/sensor)**

Camera values
Image values
Calculated values

Camera	<b>Minox A Ills</b>	
Lens	<b>Complan</b>	
Focal length	15 mm	<i>lens</i>
KB focal length	47 mm	
Crop factor	3,16	
Film	<b>ADOX CMS 20 (exposed ISO 12)</b>	
Negative/sensor width	11 mm	<i>Minox film negative</i>
Negative/sensor height	8 mm	<i>Minox film negative</i>
Negativesensor size	88 mm <sup>2</sup>	<i>Minox film negative</i>
Digital image width	9504 Pixel	<i>(from image file)</i>
Digital image height	6336 Pixel	<i>(from image file)</i>
Pixel size on negative/sensor	0,00130486 mm	<i>(Negative or sensor width / Digitized negative width)</i>
Image file	Film 1-11.jpg	
Shooting technique	flash, bulb, distance dial 1m	
Object distance	1000 mm	<i>measured with a ruler</i>
Object reference width	400 mm	<i>(object width of the test pattern)</i>
Digitized negative width	8430 Pixel	<i>(negative width in image file)</i>
Image reference width	4583 Pixel	<i>(measured in image file)</i>
Magnification object-negative	66,89	<i>(Object reference width / Image reference width * Digitized negative width / Negative/sensor width)</i>

<b>Siemens star</b>	48 Rays	<a href="https://www.ags.tu-bs.de/?id=produktionen:medientechnik:siemensstern">https://www.ags.tu-bs.de/?id=produktionen:medientechnik:siemensstern</a>
Limiting diameter (scan)	45 Pixel	(measured in scan)
Limiting diameter (negative)	0,06 mm	(Limiting diameter scan * pixel size)
Limiting diameter (object)	3,93 mm	(Limiting diameter negative * magnification)
Circumference on negative	0,18 mm	(Limiting diameter negative * pi)
<b>Line pairs per mm</b>	<b>260</b> LP/mm	(number of rays / circumference on negative)
Lines / picture height	5724 LPH	(Negative height * line pairs * 2)
Photo print up to	572            416	Photo print max. size in mm x mm (at 5 LP/mm eye resolution limit)

<b>USAF 1951</b>	top left	top right	bottom right	bottom left
Group	1	1	0	1
Element	2	1	6	3
Resolution'	2,245 LP/mm	2,000 LP/mm	1,782 LP/mm	2,520 LP/mm
<b>Resolution</b>	<b>150</b> LP/mm	<b>134</b> LP/mm	<b>119</b> LP/mm	<b>169</b> LP/mm

(Resolution': object size)  
 (Resolution = magnification \* resolution')