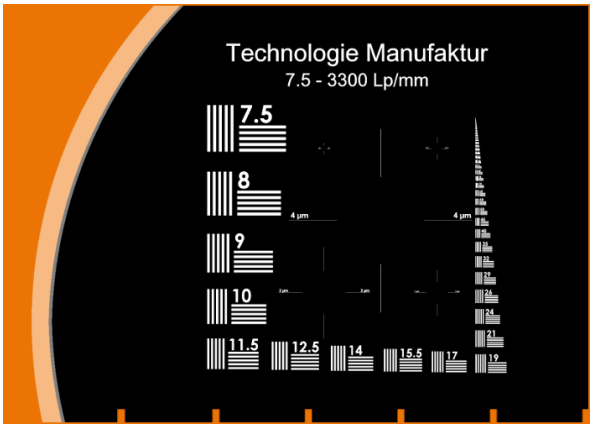
Resolution Chart TC-RT01

Testchart with 7.5 - 3300 line pairs per mm and Pinholes from 4 µm to 0.25 µm



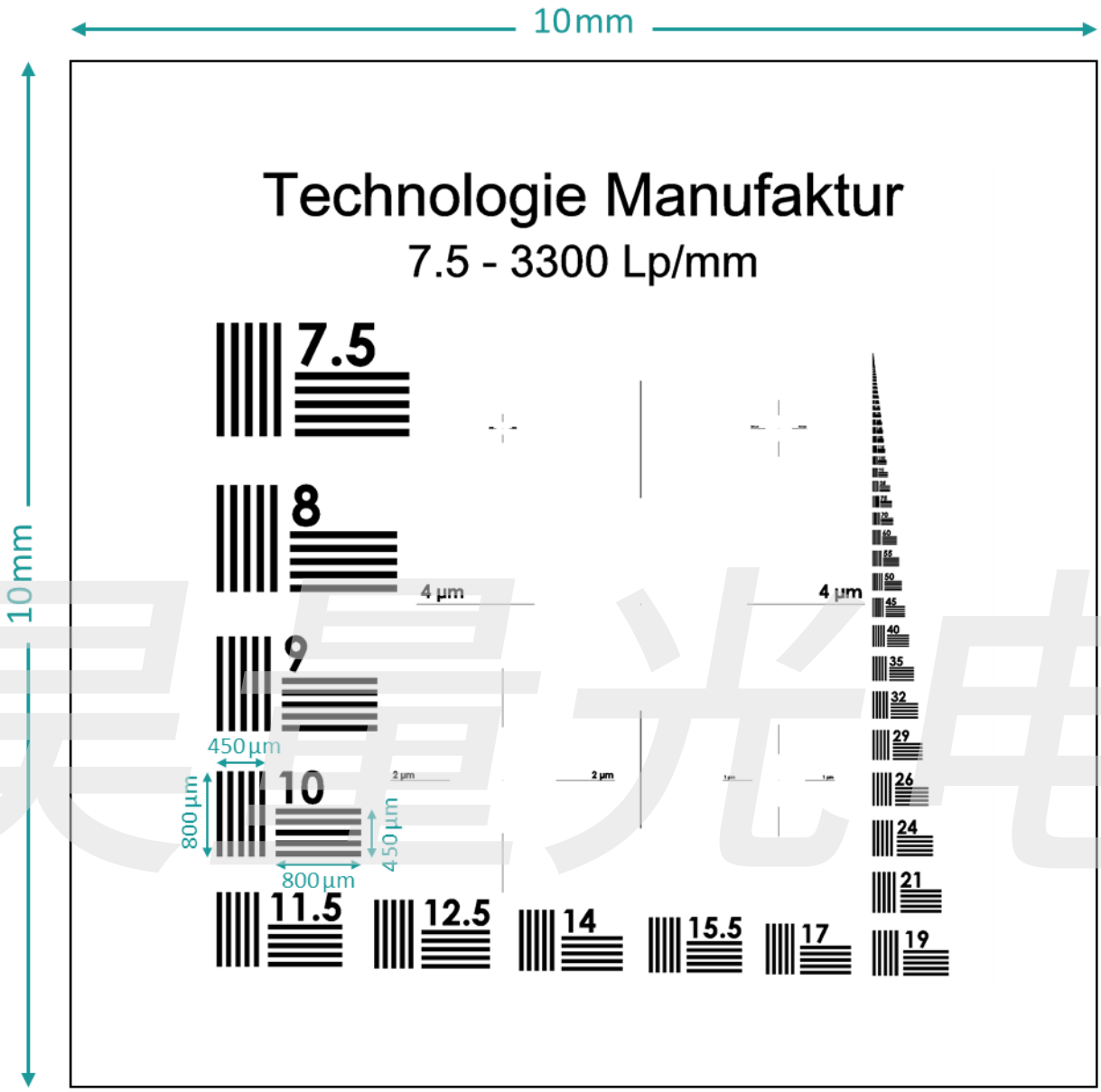
With this resolution test chart, the resolution limit of an objective can be determined very easily and quickly in transmitted light. There are 58 line patterns with 7.5 to 3300 line pairs per mm in horizontal and vertical alignment. The simple arrangement of the structures and direct reading of the structure size on the test ensures intuitive handling. In addition, there are 5 pinholes with diameters between 4.0 µm and 0.25 µm to allow a more detailed characterization of micro-imaging optics. The structures are implemented as negative, i.e. only the structures are transparent, the background is blocked by a chrome layer.

Our high-resolution testcharts are made with high-precision e-beam lithography. A quartz substrate with broad spectral transmission (DUV-VIS-NIR), on which a chromium layer of high optical density is applied, serves as a support. The test structures are produced by ablation of the chromium layer, whereby structural sizes down to 100 nm are possible. At the same time, excellent dimensional tolerances and straightness of the structural edges is ensured.

For use with a microscope objective lens there is a version with a 0.17 mm cover glass available.

Substrate	Quartz wafer (fused silica), 10 mm x 10 mm x 1 mm (layout see next page)
Substrate holder	Microscope slide format 75 mm x 25 mm x 1.5 mm, Stainless steel with laser engraving
Patterned layer	Chrome, optical density OD > 8@400 nm / 6@550 nm / 4.5@750 nm / 3.6@1 µm
Line patterns	58 groups, 7.5 – 3300 lp/mm (line widths 66.7 µm – 0.152 µm, see table on next page)
Pinholes (diameter)	4 µm, 2 µm, 1 µm, 0.5 µm, 0.25 µm
Dimensional tolerance (max. absolute error)	100 nm/cm = 10^{-5}
Spectral transmission range	200 nm – 2000 nm
Cover Glass (optional)	0.17 mm optical thickness

Resolution testchart layout:



Line pattern groups (each of 5 lines horizontal & vertical)
Line pairs/mm:

7.5	8	9	10	11.5	12.5	14	15.5	17	19	21	24	26	29	32
35	40	45	50	55	60	70	75	85	95	105	115	130	140	160
170	190	220	240	270	300	330	360	400	450	500	550	600	700	850
950	1050	1150	1300	1400	1600	1800	2000	2200	2400	2700	3000	3300		

Dimensions of pinholes aiming lines

pinhole	line length	line width
4 µm	1100.00 µm	1.00 µm
2 µm	550.00 µm	0.50 µm
1 µm	275.00 µm	0.25 µm
0.5 µm	137.50 µm	0.25 µm
0.25 µm	68.75 µm	0.25 µm

Electron microscopy micrograph of the finest resolution patterns