

The report on laboratory work №4
Optical resolution of F'

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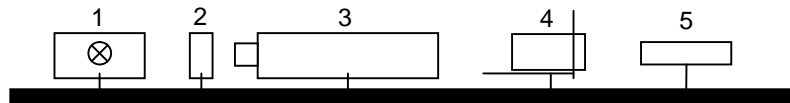
Tested objective: Carl Zeiss T* Planar 80mm F2.8

Yusuf Aslanyurek
VGIK 2004

The description

For measurement of resolution of an objective we have established an objective on an optical bench on the one hand of collimator and shaped to the chart with another. Observing for the image the worlds through a microscope standing up for an objective, we determine last shaped group in which borders between strokes are distinct and thus we determine resolution of a tested objective.

Measurements were spent on an optical bench under the following circuit:



- 1 - A light source
- 2 - Shaped the world
- 3 - Collimator
- 4 - The rotary support, a tested objective
- 5 - A microscope

Results

F stop	Chart	Group	N0	line / mm
2.8	3	17	31.25	625
4	3	11	22.5	450
5.6	3	5	15.75	315
8	4	11	11.25	225
11	4	6	8.12	162,4
16	5	12	5.94	118,8
22	5	5	3.94	78,8

For calculation of resolution of an objective we use the following formula:

$$N = N0 * f_{call} / F_{lens}$$

$$31.25 * 1600 / 80 = 625 \text{ lpmm}$$

Conclusion

By results of calculations it is possible to conclude, that the greatest resolution of a tested objective is observed at the most open F-stop (2.8) - 625 lines per mm.