

CAMERA CALIBRATION CERTIFICATE

CAMERA TYPE : RC20
LENS TYPE : 21/4 NAGA-F
LENS NO. : 7192

Calibration date: 17.03.2004

LEICA AG, HEERBRUGG

 **swissoptic**
SwissOptic AG
Heinrich-Wild-Strasse
CH-9435 Heerbrugg
Schweiz



Aperture: 4.0
 Filter on goniometer: 450 NM
 Filter on camera: --
 Principal distance for focussing distance 900 m : 213.71 mm

Radial distortion (micrometers) referred to principal point of symmetry (PPS)
 (Positive values denote image displacement away from center)

Radius mm	Half - Sides				Mean
	1	3	2	4	
10	1.5	1.1	1.4	1.2	1.3
20	2.1	2.0	2.2	2.5	2.2
30	2.8	2.8	3.2	2.8	2.9
40	4.1	3.9	4.5	3.8	4.0
50	4.3	3.4	5.0	3.8	4.1
60	3.5	2.6	5.2	2.7	3.5
70	3.0	1.4	4.0	1.6	2.5
80	1.2	1.0	2.7	0.8	1.4
90	0.8	0.4	1.2	0.0	0.6
100	-1.7	-0.3	-0.3	-0.6	-0.7
110	-3.4	-1.7	-2.2	-0.8	-2.0
120	-4.7	-4.1	-4.3	-2.3	-3.8
130	-4.4	-3.3	-3.7	-2.1	-3.3
140	-2.1	-2.5	-1.5	-0.6	-1.6
148	1.0	-1.0	1.7	0.0	0.4

Photographic resolution (line pairs per millimeter)

International 3-line test-chart, contrast (log) : 2.0

Aperture: 4.0
 Filter: 450 NM
 Film: KODAK PANATOMIC X 2412
 Developer: KODAK HC110

Angle (deg)	0	5	10	15	20	25	30	35
Radial:	106	106	104	102	56	43	37	61
Tangential:	94	94	92	88	59	62	56	56

AWAR (Area weighted average resolution) in lp/mm: 64

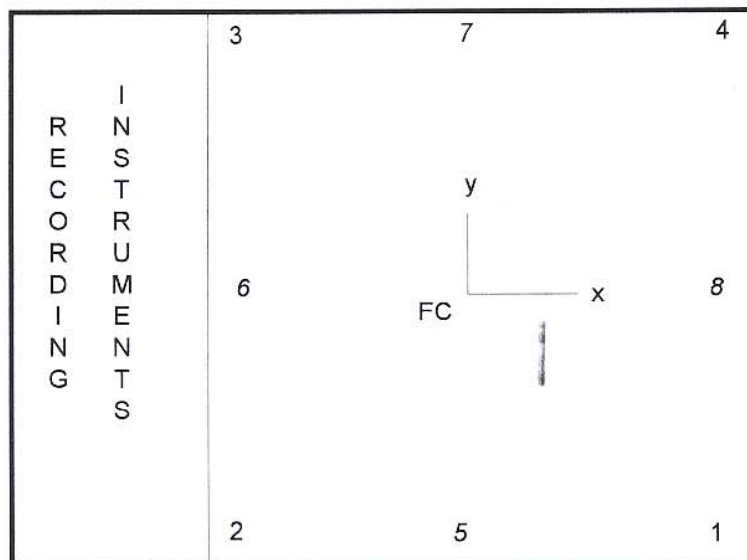
**Principal point of autocollimation (PPA) and
principal point of symmetry (PPS)**

referred to central cross (FC), see diagram

	x (mm)	y (mm)
PPA	-0.010	-0.005
PPS	0.000	-0.004

Fiducial marks, referred to central cross (FC)

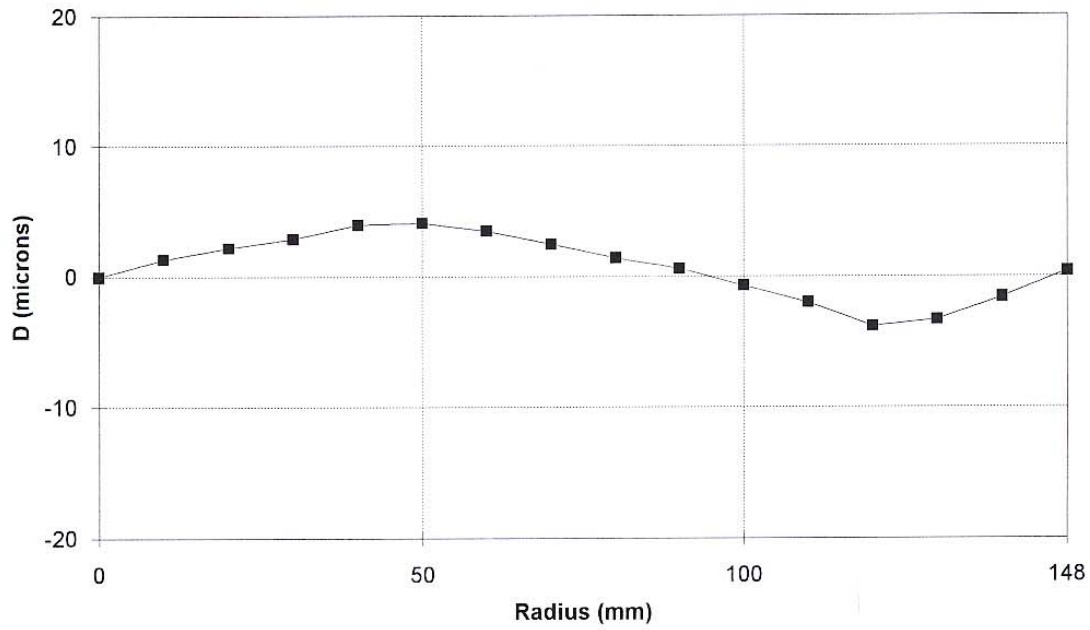
	x (mm)	y (mm)		x (mm)	y (mm)
1	106.004	-106.003	5	0.003	-109.998
2	-106.002	-106.000	6	-110.004	0.001
3	-106.004	106.003	7	-0.003	110.003
4	106.003	106.001	8	110.003	-0.002



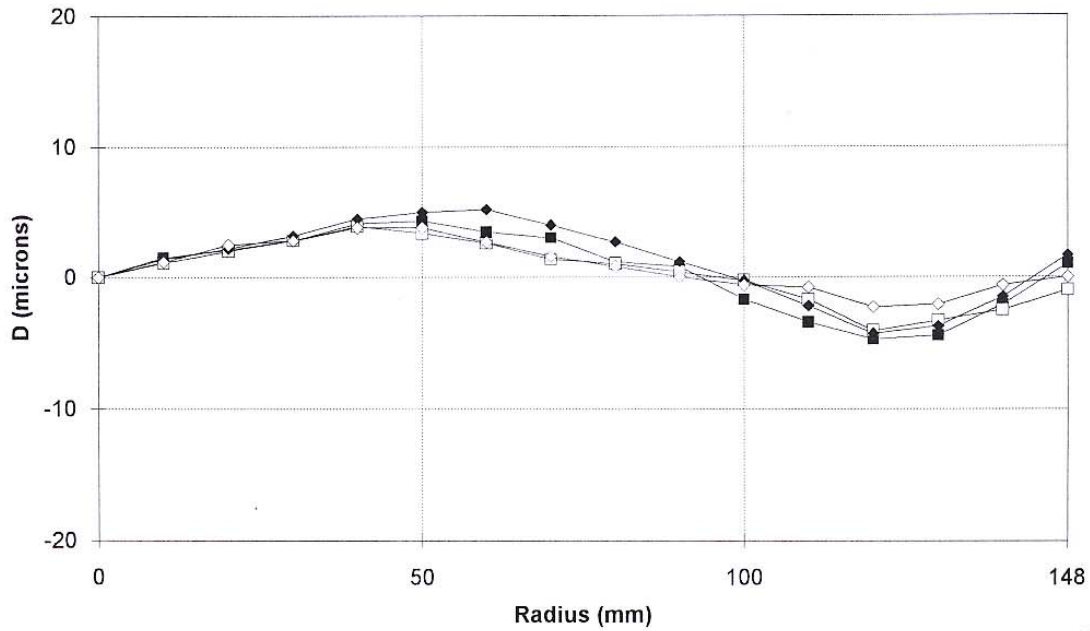
as seen on focal plane frame

Aperture: 4.0
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Filter on camera: --
Principal distance for focussing distance 900 m : 213.71 mm

Mean radial distortion



Radial distortion for semi-diagonals referred to PPS



■ 1 □ 3 ◆ 2 ◇ 4

EM
How