

# CAMERA CALIBRATION CERTIFICATE

CAMERA TYPE : RC30  
LENS TYPE : 15/4 UAG-S  
LENS NO. : 13215

Calibration date: 30.09.2002

LEICA AG, HEERBRUGG

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

FD 017 *Klo*

Aperture: 4.0  
 Filter on goniometer: VIS (400 - 700 NM)  
 Filter on camera: --  
 C.F.L. : 152.86 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	0.2	-0.2	-0.2	0.1	0.0
20	0.1	-0.5	-0.2	0.2	-0.1
30	-0.3	-0.6	-0.1	-0.3	-0.3
40	-0.1	-0.5	-0.3	-0.1	-0.2
50	-0.1	-0.9	-0.5	-0.1	-0.4
60	-0.7	-0.8	0.2	-0.3	-0.4
70	-0.2	-0.8	-0.3	0.0	-0.3
80	-0.1	0.2	0.1	0.8	0.2
90	1.6	1.0	0.2	1.3	1.0
100	2.0	1.8	1.1	1.7	1.6
110	2.8	2.1	1.5	1.7	2.0
120	2.8	2.2	0.4	0.7	1.5
130	1.6	1.8	-0.8	-1.3	0.3
140	0.5	1.7	-2.4	-3.2	-0.8
148	-1.2	-0.9	-4.9	-5.2	-3.0

**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	40	45
Radial:	104	117	129	101	78	95	101	121	101	83
Tangential:	117	116	114	87	103	76	70	79	69	59

AWAR (Area weighted average resolution) in lp/mm: 91

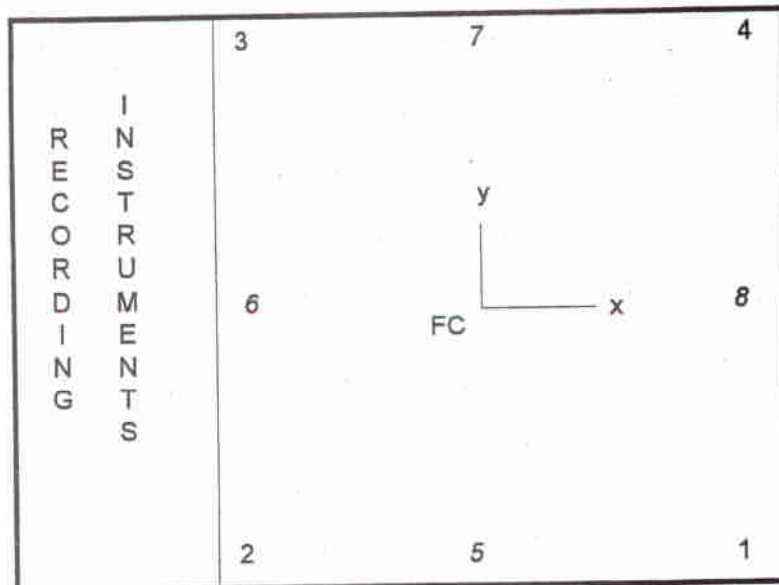
FO 017  
 7/20

**Principal point of autocollimation (PPA) and principal point of symmetry (PPS) referred to central cross (FC), see diagram**

	x (mm)	y (mm)
PPA	-0.001	0.015
PPS	-0.006	0.014

**Fiducial marks, referred to central cross (FC)**

	x (mm)	y (mm)		x (mm)	y (mm)
1	106.001	-105.999	5	0.000	-110.000
2	-106.004	-106.001	6	-110.001	-0.002
3	-106.002	106.000	7	0.000	110.000
4	106.005	106.001	8	110.003	0.000

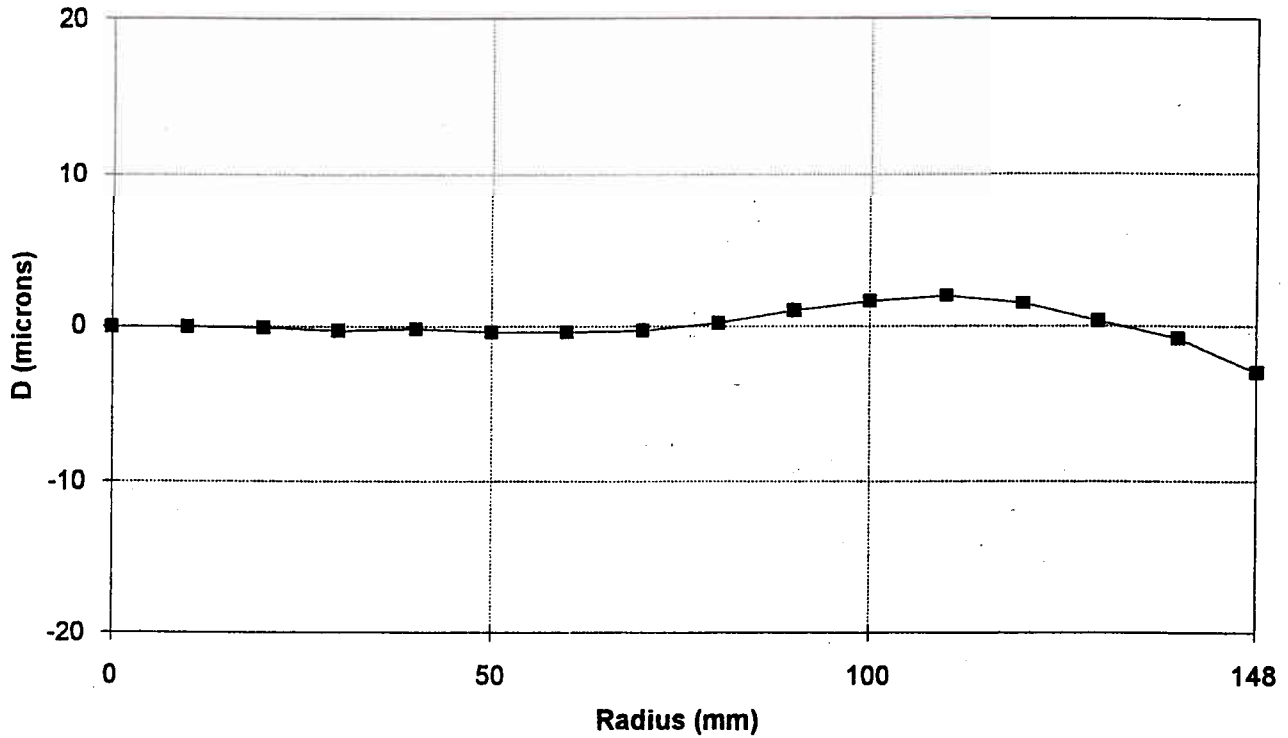


as seen on focal plane frame

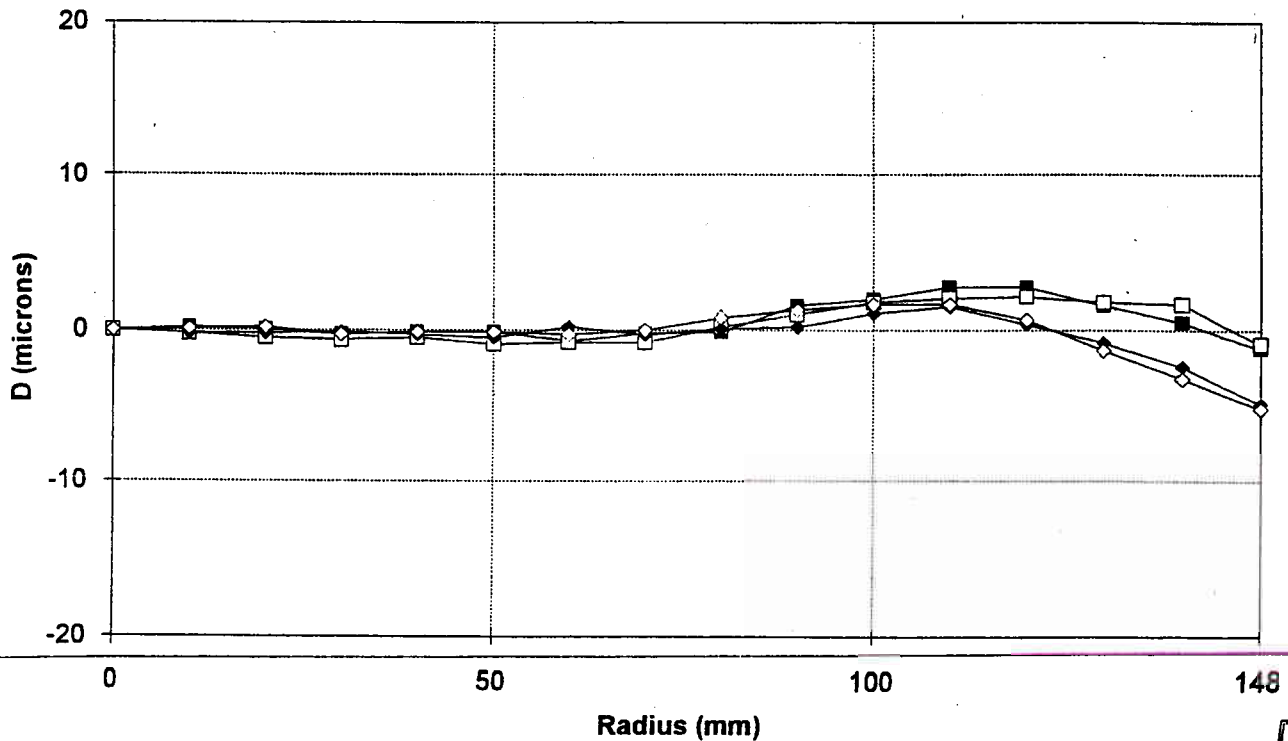
FO 017 *hao*

Aperture: 4.0  
Filter on goniometer: VIS (400 - 700 NM)  
Filter on camera: -  
C.F.L. : 152.86 mm

### Mean radial distortion



### Radial distortion for semi-diagonals referred to PPS



—■— 1 —□— 3 —◆— 2 —◇— 4

PU 017  
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