

CAMERA CALIBRATION CERTIFICATE

CAMERA TYPE : RC10
LENS TYPE : 15 UAG II
LENS NO. : 3045

Calibration date: 19.02.2004

LEICA AG, HEERBRUGG

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



Aperture: 4.0
 Filter on goniometer: 450 NM
 Filter on camera: --
 C.F.L. : 152.83 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	-2.3	-1.9	-1.9	-1.9
20	-2.4	-3.9	-3.9	-4.0	-3.5
30	-4.0	-5.2	-4.6	-5.7	-4.8
40	-5.1	-5.2	-6.3	-6.0	-5.6
50	-6.0	-5.3	-6.8	-5.5	-5.9
60	-5.9	-4.1	-5.5	-4.9	-5.1
70	-3.3	-2.6	-3.8	-3.5	-3.3
80	-0.5	-0.3	-1.7	-1.9	-1.1
90	1.1	0.9	-0.4	-1.0	0.1
100	2.1	1.3	1.0	-0.5	0.9
110	1.8	1.1	1.3	0.1	1.0
120	2.2	1.5	0.4	0.4	1.1
130	2.4	1.9	1.0	1.0	1.5
140	2.7	3.8	3.0	3.4	3.2
148	5.4	5.5	5.0	6.2	5.5

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	93	129	90	78	75	90	61	20	9
Tangential:	104	82	40	39	33	34	39	39	39	26

AWAR (Area weighted average resolution) in lp/mm: 50

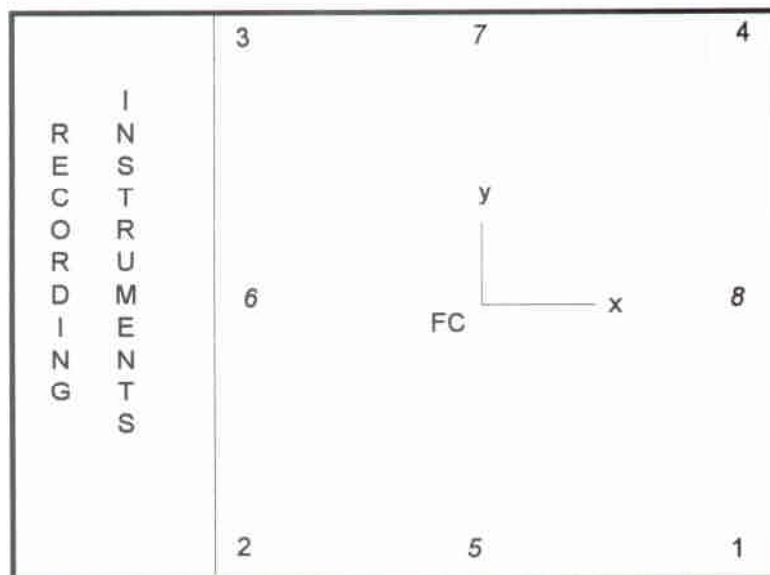
Handwritten signature

**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	0.006
PPS	0.003	0.005

Fiducial marks, referred to central cross (FC)

	x (mm)	y (mm)
1	106.002	-106.000
2	-105.999	-105.997
3	-106.004	106.003
4	106.005	106.003

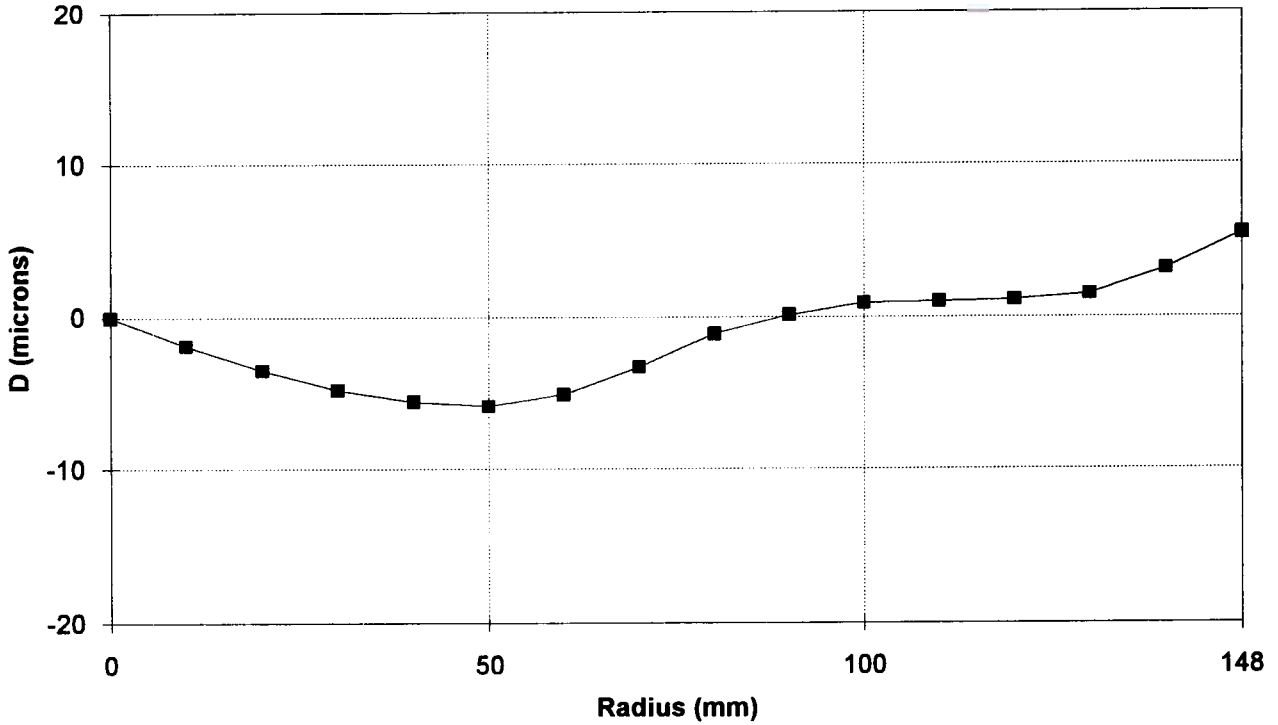


as seen on focal plane frame

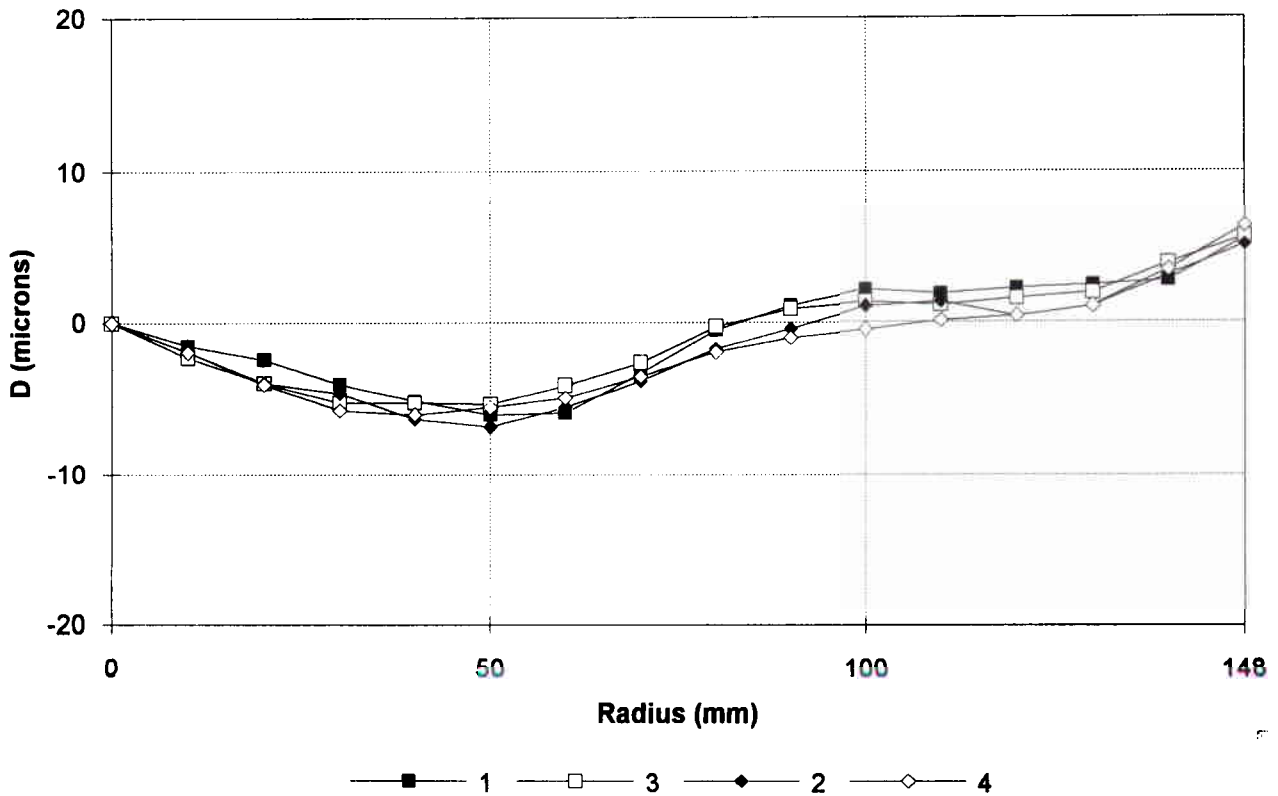
Hao

Aperture: 4.0
Filter on goniometer: 450 NM
Filter on camera: --
C.F.L. : 152.83 mm

Mean radial distortion



Radial distortion for semi-diagonals referred to PPS



Hao

Camera Calibration Certificate

(Cover sheet)

Object	Camera Type	Lens Type	Lens-No (Serial-No)	Remarks
	RC 10	15 UAG II	3045	
	RC 10A			
	RC 20			
	RC 30			

Acceptance	Characteristics	Acceptance	Remarks
	Radial distortion	yes	
	Photographic resolution	yes	
	Principal point of autocollimation [PPA]	yes	
	Principal point of symmetry [PPS]	yes	
	Fiducial marks	yes	
	Mean radial distortion	yes	
	Radial distortion for semi-diagonals referred to PPS	no	2 - 2.5 μm out of range

Inspection			Signature / Remarks
Calibration Date	19.02.2004	Operating hours:	h
Inspector	Name: Oeyvind Hagen	Signature:	<i>Oeyvind Hagen</i>
	Position: Inspector		
	Inspection stamp-No: FO 017		
Inspection plan	487872	(Identification-No)	
	14.04.1989	(Version)	
Lens cone calibration process specification	870105	(Identification-No)	
	19.01.2000	(Version)	

Maintenance			Remarks
The last date, when service/ overhaul of this lens cone was performed.	11.11.1974	Operating hours	h
Overhaul urgently required:	yes	To avoid any malfunctions / damages, it is recommended to perform a complete service / overhaul as soon as possible. See „Lens calibration process specification“ or „RC 10 Technical Reference Manual“	