

STEPPER 7

COMPANY: Alcatel Mietec

MACHINE NUMBER	#512702
INSTALLATION DATE	22 nd Feb - 26 th March '96
ENGINEER	A. DAY - M. FORDHAM

CLASSIFICATION	ITEM		RESULT		STANDARD	JUDGE
1	EXPOSURE	1	OPEN FRAME		NO PARTICLES	OK
		2	DISTORTION (INCLUDING MAGNIFICATION)		DX um DY um	
2	ILLUMINATION SYSTEM	1	ILLUMINATION INTENSITY		773 mw/cm ²	550 mw/cm ² or more
			ILLUMINATION UNIFORMITY		0.5%	± 1% or less
		2	L. I. CONTROL ACCURACY		0.21%	± 1.2% or less
		3	MASKING BLADE ACCURACY		MAX 70 um	± 110 um or less
3	ALIGNMENT SYSTEM	1	ROC ACCURACY		MAX 0.004 um	3 sig. 0.01 um or less
		2	RET. ROT. ACCURACY		0.0035 um	± 0.02 um or less
			RET. ROT. REPEATABILITY		RANGE 0.001 um	0.03 um or less
		3	OPTICAL	i LINE TV	MAX -12 mrad	± 35 mrad or less
			AXIS	He Ne/B2	ka, kb MAX -14 mrad	± 20 mrad or less
			SYSTEM	TV	kc -2 mrad	± 7 mrad or less
		4	TOC MEASUREMENT	i LINE TV	MAX 0.03 um	3 sig. 0.04 um or less
			STABILITY	He Ne TV	MAX 0.02 um	3 sig. 0.04 um or less
				B2 TV	MAX 0.02 um	3 sig. 0.04 um or less
4	AUTO FOCUS AND TILT SYSTEM	1	MEASUREMENT STABILITY	FOCUSING	3 sig 0.038 um	3 sig. 0.10 um or less
				TILT	X 2.58 ppm	3 sig. 7 ppm or less
				COMP.	Y 2.81 ppm	
		2	REPEATABILITY	FOCUSING	3 sig 0.09 um	3 sig. 0.12 um or less
				TILT	X 3.7 ppm	3 sig. 8 ppm or less
				COMP.	Y 3.4 ppm	
		3	GLOBAL TILT (GTOC) MEASUREMENT STABILITY		X 2.9 ppm Y 3.0 ppm	3 sig. 5 ppm or less
		4	GLOBAL TILT COMP. REPEATABILITY		X 7.9 ppm Y 6.3 ppm	3 sig. 10 ppm or less
5	TTL A/FOCUS	1	TTL A/F MEASUREMENT REP.		0.04 um	3 sig. 0.10 um or less
6	X - Y STAGE	1	ORTHOGONALITY		0.1 ppm	± 0.5 ppm or less
		2	SCALING (STAGE MAGNIFICATION)		X 0.2 ppm Y 0.42 ppm	± 0.5 ppm or less
		3	STEPPING ACCURACY		X 0.030 um Y 0.038 um	3 sig. 0.05 um or less
		4	STEPPING REPEATABILITY	DxD TILT OFF/ON	X 0.038 um Y 0.038 um	3 sig. 0.05 um or less
				DxD TILT OFF/OFF	X 0.031 um Y 0.034 um	3 sig. 0.07 um or less
7	ALIGNMENT SYSTEM	1	He Ne TV AGA (DxD TILT OFF)	MODE 2	X Y	um [m] + 3 sig 0.07 um or less
		2	He Ne TV AGA (DxD TILT ON)	MODE 4	X Y	um [m] + 3 sig 0.07 um or less
		3	B2 TV AGA (DxD TILT OFF)	MODE 4	X Y	um [m] + 3 sig 0.07 um or less
		4	B2 TV AGA (DxD TILT ON)	MODE 2	X Y	um [m] + 3 sig 0.07 um or less
		5	BASE LINE STABILITY	IL MODE 1 IL MODE 3	um um	3 sig. 0.04 um or less
8	PREALIGNMENT SYSTEM	1	MECHANICAL PREALIGNMENT ACCURACY		X 7.25 um YL 8.76 um YR 4.77 um	3 sig. 33 um or less
9	THROUGHPUT	1	He Ne(mode2) AGA 160ms [inch shots]	IL MODE 1 IL MODE 2	wafers/hour wafers/hour	wafers/hour or more
10	RELIABILITY	1	WAFER FEEDING	300 WAFERS	NO TROUBLE	No trouble
		2	RETICLE LOADING	50 TIMES	NO TROUBLE	No trouble

MONO-LITH® ANALYSIS

INTRAFIELD

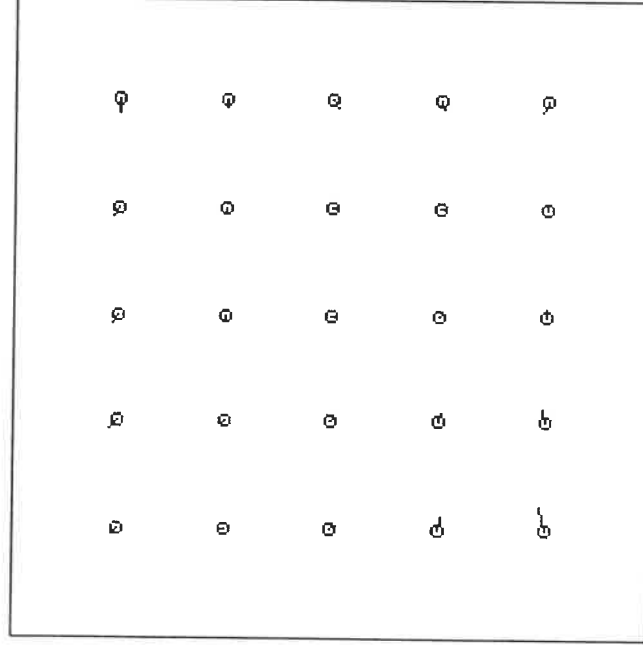
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Ver 3.1.5 S/N 177

ACTIVE: A:\S7150396.REG

CREATED: MAR-15-96

VECTOR MAP

—S7150396 [MOD]



COEFFICIENTS

S7150396

TRANSLATION	X	0 nm.
	Y	-6 nm.
ROTATION		0.7 nm/mm.
REDUCTION		-0.6 nm/mm
TRAPEZOID	1	-0.01 nm/mm
	2	0.12 nm/mm
ANAMORPHISM	1	-0.9 nm/mm
	2	-0.9 nm/mm
DISTORTION	3rd	0.010 nm/mm
	5th	-0.00007 nm/mm

Before Analysis
Crotbls Removed
After Analysis

RESIDUALS	X	16nm	10nm	5nm
	Y	11nm	13nm	9nm

SCALE: 0.10 um.

MONO-LITH® ANALYSIS

INTRAFIELD

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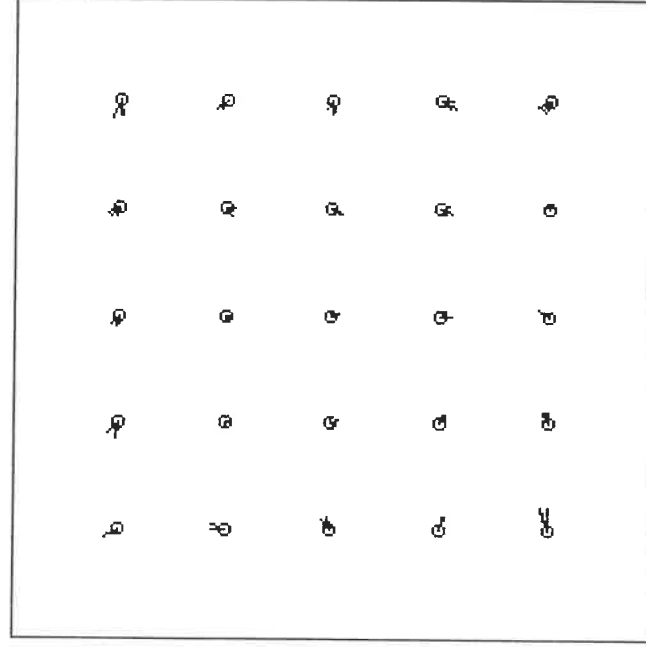
Ver 3.1.5 S/N 177

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CREATED: MAR-15-96

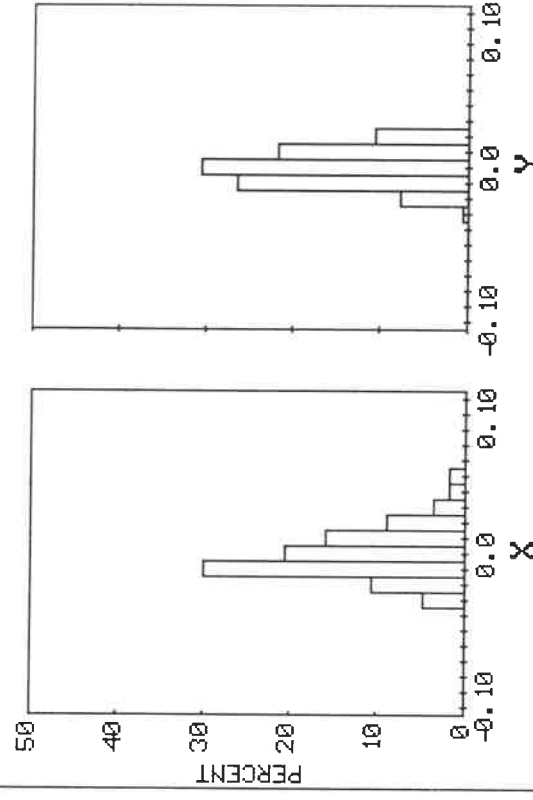
VECTOR MAP

—S7150396 [MEA]



HISTOGRAM (X/Y)

S7150396 [MEA]



MAX: 0.048
AUG: -0.000
MIN: -0.031
S.D: 0.016
OUT: 0
SIZE: 100

MAX: 0.025
AUG: -0.000
MIN: -0.025
S.D: 0.011
OUT: 0
SIZE: 100

SCALE: 0.10 um.

Canon FPA DATA SHEET

ILLUMINATION SYSTEM INTENSITY/UNIFORMITY

- ☒ Normal
☐ Super Illumination
☐ Ring

Machine No: 512702

Customer: MIETEC

Model

- ☐ FPA-2000i1
☐ FPA-2500i2
☒ FPA-2500i3

Date: 11TH MARCH 1996

Engineer: DAY / FORDHAM

Lamp time: 3.8 hr

*** ILLUMINANCE UNIFORMITY CHECK ***

1. Sampling Area ; X = 20.0000 mm Y = 22.5000 mm

2. Sampling Pitch ; X = 1.0000 mm Y = 1.1250 mm

4. Sampling Count / Point ; 100

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-99.6	-99.5	99.4	99.3	99.3	99.3	99.3	99.3	99.4	99.3	99.4	99.4	99.5	99.5	99.5	99.5	99.5	99.5	99.6	-99.7	-99.7
2	-99.5	99.4	99.4	99.4	99.5	99.4	99.5	99.5	99.6	99.5	99.5	99.6	99.7	99.7	99.7	99.6	99.7	99.6	99.7	99.6	-99.7
3	99.4	99.4	99.4	99.5	99.5	99.5	99.5	99.5	99.6	99.6	99.7	99.7	99.7	99.7	99.8	99.8	99.8	99.8	99.7	99.7	99.6
4	99.3	99.4	99.5	99.5	99.5	99.6	99.5	99.6	99.6	99.6	99.8	99.7	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.6	99.6
5	99.3	99.4	99.5	99.5	99.5	99.6	99.6	99.6	99.6	99.7	99.7	99.8	100.0	100.0	100.0	100.0	99.8	99.8	99.8	99.8	99.6
6	99.2	99.4	99.4	99.5	99.5	99.6	99.6	99.6	99.7	99.6	99.7	99.7	99.8	99.8	99.8	100.0	100.0	99.8	99.8	99.8	99.7
7	99.2	99.3	99.4	99.5	99.5	99.6	99.7	99.6	99.7	99.7	99.8	99.8	99.8	100.0	100.0	100.0	100.1	100.0	100.0	99.8	99.7
8	99.2	99.4	99.4	99.5	99.6	99.6	99.7	99.7	99.8	99.7	100.0	99.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	99.7
9	99.2	99.4	99.4	99.5	99.6	99.6	99.8	99.7	99.8	99.8	100.0	99.8	100.0	100.0	100.1	100.1	100.1	100.0	100.1	99.8	99.7
10	99.3	99.4	99.4	99.5	99.5	99.6	99.8	99.7	99.8	99.8	100.0	100.0	100.0	100.1	100.0	100.0	100.0	99.8	100.0	99.8	99.8
11	99.3	99.4	99.5	99.5	99.6	99.6	99.7	99.7	99.8	99.8	100.0	100.0	99.8	100.1	100.1	100.1	100.0	100.0	100.1	100.0	99.8
12	99.2	99.4	99.5	99.5	99.5	99.5	99.7	99.7	99.8	99.7	100.0	99.8	99.8	100.0	100.0	100.1	100.1	100.0	100.1	99.8	99.8
13	99.3	99.4	99.4	99.5	99.5	99.6	99.7	99.7	99.8	99.7	99.8	99.8	100.0	100.1	100.0	100.1	100.1	100.0	100.0	99.8	99.8
14	99.2	99.4	99.4	99.5	99.6	99.6	99.6	99.6	99.8	99.7	99.8	100.0	100.0	100.1	100.0	100.0	100.0	100.0	100.1	99.8	99.7
15	99.2	99.4	99.4	99.5	99.5	99.6	99.6	99.6	99.7	99.8	99.8	100.0	100.0	100.0	99.8	100.0	100.0	100.0	100.0	99.8	99.7
16	99.2	99.3	99.4	99.4	99.5	99.5	99.6	99.6	99.6	99.7	99.5	99.8	99.8	100.0	99.8	100.0	100.0	100.0	100.0	99.8	99.7
17	99.2	99.3	99.4	99.5	99.4	99.5	99.5	99.6	99.7	99.7	99.8	99.8	99.8	100.0	99.8	100.0	99.8	99.8	99.8	99.8	99.7
18	99.2	99.2	99.3	99.4	99.4	99.5	99.5	99.5	99.6	99.7	99.7	99.8	99.8	99.8	99.8	99.8	99.8	100.0	100.0	99.8	99.8
19	99.3	99.2	99.3	99.3	99.4	99.4	99.5	99.5	99.6	99.6	99.7	99.8	99.8	99.7	99.8	99.8	99.8	100.0	100.0	99.8	100.0
20	-99.4	99.3	99.2	99.2	99.3	99.3	99.4	99.5	99.5	99.6	99.6	99.7	99.7	99.8	99.8	99.7	99.7	99.8	99.8	100.0	100.2
21	-99.5	-99.4	99.2	99.1	99.2	99.2	99.3	99.3	99.4	99.5	99.5	99.6	99.6	99.6	-99.6	99.6	99.7	99.8	100.0	100.2	100.2

Distribution (Illumination) = 0.5%

Max Value = 100.1

Min Value = 99.1

INTENSITY	773	mw/cm ²
UNIFORMITY	0.5	%

Center Position Measurement Data

Lamp Input Power	Uniformity Checker	Light Integrator
1000 W	571.0 mW/cm ²	574.0 mW/cm ²
1500 W	773.0 mW/cm ²	776.0 mW/cm ²
Machine Parameter	770.0 mW/cm ²	773.0 mW/cm ²

ILLUMINATION SYSTEM
INTENSITY/UNIFORMITY

- ☐ Normal
☒ Super Illumination (SIA)
☐ Ring

Machine No: S12702

Customer: MIETEC

Model

- ☐ FPA-2000i1
☐ FPA-2500i2
☒ FPA-2500i3

Date: 11TH MARCH 1996

Engineer: DAY / FORDHAM

Lamp time: 3.1 hr

*** ILLUMINANCE UNIFORMITY CHECK ***

1. Sampling Area ; X = 20.0000 mm Y = 22.5000 mm

2. Sampling Pitch ; X = 1.0000 mm Y = 1.1250 mm

4. Sampling Count / Point ; 100

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-99.8-100.3	100.3	100.3	100.2	100.3	100.4	100.5	100.6	100.5	100.6	100.7	100.8	100.7	100.8	100.8	100.9	100.9	101.0	101.0	-100.1	
2	-100.3	100.3	100.1	100.2	100.2	100.4	100.5	100.5	100.7	100.7	100.6	100.8	100.9	100.9	101.0	100.9	100.9	101.0	100.9	100.8	-100.9
3	100.0	100.2	100.1	100.3	100.3	100.3	100.4	100.6	100.7	100.7	100.8	100.9	101.0	101.0	101.0	101.1	101.0	101.1	101.0	100.9	100.8
4	99.8	100.1	100.1	100.2	100.2	100.4	100.4	100.5	100.6	100.6	100.8	101.0	101.0	101.0	101.0	101.1	101.1	101.1	101.0	100.9	100.6
5	99.7	100.0	100.0	100.1	100.2	100.4	100.5	100.5	100.6	100.7	100.8	100.9	101.0	101.0	101.2	101.1	101.1	101.2	101.0	100.9	100.7
6	99.6	99.7	99.8	100.0	100.1	100.2	100.5	100.5	100.6	100.7	100.8	100.9	101.0	101.0	101.2	101.1	101.1	101.1	100.9	100.8	100.6
7	99.5	99.7	99.8	100.0	100.1	100.2	100.3	100.4	100.5	100.7	100.7	100.7	100.8	100.9	101.1	101.1	101.1	101.1	101.0	100.8	100.5
8	99.6	99.6	99.8	100.0	100.1	100.2	100.2	100.3	100.4	100.4	100.4	100.5	100.6	100.7	101.0	101.0	101.1	101.1	101.0	100.7	100.5
9	99.6	99.7	99.8	100.0	100.1	100.2	100.2	100.2	100.2	100.2	100.3	100.4	100.6	100.6	100.9	100.9	101.0	101.0	100.9	100.7	100.5
10	99.7	99.7	99.8	99.8	100.0	100.1	100.2	100.1	100.1	100.1	100.2	100.2	100.4	100.6	100.7	100.8	100.8	100.8	100.8	100.7	100.4
11	99.6	99.7	99.8	100.0	100.0	99.8	100.0	99.8	100.0	99.8	100.1	100.1	100.3	100.4	100.6	100.7	100.8	100.8	100.8	100.6	100.3
12	99.6	99.7	99.7	99.8	99.7	100.0	99.8	99.8	99.8	99.6	99.8	100.0	100.1	100.3	100.4	100.6	100.6	100.8	100.7	100.5	100.2
13	99.6	99.7	99.7	99.8	99.7	99.7	99.8	99.6	99.8	99.6	99.7	100.0	100.0	100.2	100.4	100.6	100.5	100.6	100.6	100.3	100.1
14	99.5	99.7	99.7	99.7	99.7	99.8	99.7	99.6	99.7	99.7	99.8	99.8	100.0	100.2	100.1	100.4	100.4	100.5	100.5	100.2	100.0
15	99.6	99.6	99.7	99.7	99.7	99.7	99.8	99.6	99.7	99.7	99.7	100.0	100.0	100.1	100.2	100.3	100.2	100.3	100.4	100.1	99.7
16	99.6	99.7	99.6	99.7	99.6	99.7	99.7	99.7	99.6	99.7	99.5	99.8	100.0	100.0	100.1	100.1	100.2	100.2	100.2	100.0	99.6
17	99.5	99.7	99.6	99.7	99.6	99.7	99.7	99.6	99.7	99.7	99.7	99.8	99.8	100.0	100.0	100.0	100.1	100.0	100.0	99.7	99.4
18	99.6	99.7	99.7	99.6	99.6	99.7	99.7	99.6	99.7	99.8	99.8	99.8	100.0	99.8	99.8	100.0	99.8	100.0	99.7	99.7	99.5
19	100.0	99.7	99.7	99.7	99.7	99.7	99.6	99.7	99.7	99.8	99.8	99.8	99.8	99.7	99.8	99.7	99.7	99.8	99.8	99.6	99.6
20	-100.0	99.8	99.7	99.7	99.6	99.6	99.7	99.6	99.6	99.6	99.6	99.7	99.7	99.7	99.7	99.6	99.6	99.7	99.7	99.6	-99.7
21	-99.8-100.1	99.7	99.6	99.6	99.5	99.5	99.5	99.5	99.5	99.6	99.5	99.5	99.5	99.5	99.5	99.4	99.5	99.6	99.6	-99.8	-99.1

Distribution (Illumination) = 0.9%

Max Value = 101.2

Min Value = 99.4

INTENSITY	486	mw/cm ²
UNIFORMITY	0.9	%

Center Position Measurement Data

Lamp Input Power Uniformity Checker Light Integrator

1000 W 365.0 mW/cm² 373.0 mW/cm²1500 W 479.0 mW/cm² 489.0 mW/cm²Machine Parameter 476.0 mW/cm² 486.0 mW/cm²

ILLUMINATION SYSTEM
INTENSITY/UNIFORMITY

- ☐ Normal
☐ Super Illumination
☒ Ring (SIB)

Machine No: 512702

Customer: MIETEC

Date: 11TH MARCH 1996

Engineer: DAY / FORDHAM

Lamp time: 3.4 hr

Model

- ☐ FPA-2000i1
☐ FPA-2500i2
☒ FPA-2500i3

*** ILLUMINANCE UNIFORMITY CHECK ***

1. Sampling Area ; X = 20.0000 mm Y = 22.5000 mm

2. Sampling Pitch ; X = 1.0000 mm Y = 1.1250 mm

4. Sampling Count / Point ; 100

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-99.3	-99.6	99.5	99.4	99.5	99.5	99.5	99.5	99.6	99.6	99.6	99.6	99.6	99.6	99.8	99.8	99.7	100.0	100.1	100.2	-99.6
2	-99.6	99.5	99.4	99.5	99.6	99.6	99.6	99.6	99.7	99.7	99.6	99.7	99.8	99.8	99.8	99.8	99.8	100.0	100.0	100.1	100.2
3	99.5	99.5	99.5	99.6	99.6	99.7	99.7	99.8	99.8	99.8	99.8	99.8	100.0	100.0	100.0	100.1	100.1	100.1	100.1	100.1	100.2
4	99.4	99.5	99.5	99.6	99.7	99.7	99.7	99.7	99.8	99.8	100.0	100.0	100.0	100.0	100.1	100.1	100.1	100.1	100.0	100.0	100.0
5	99.3	99.5	99.5	99.6	99.7	99.8	99.8	99.8	100.0	99.8	100.0	100.1	100.1	100.1	100.2	100.2	100.1	100.1	100.1	100.1	100.0
6	99.3	99.5	99.5	99.7	99.6	99.8	99.8	99.8	100.0	100.0	100.0	100.1	100.1	100.1	100.2	100.2	100.2	100.1	100.1	100.0	99.8
7	99.2	99.4	99.6	99.7	99.8	99.8	99.8	99.8	100.0	100.0	100.0	100.0	100.0	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.0
8	99.3	99.5	99.5	99.7	99.7	99.8	99.8	99.8	99.8	100.0	100.0	100.0	100.0	100.1	100.2	100.2	100.2	100.2	100.1	100.1	99.8
9	99.3	99.5	99.6	99.7	99.7	99.8	100.0	99.8	99.8	99.8	100.0	99.8	100.0	100.0	100.2	100.2	100.2	100.2	100.2	100.1	99.8
10	99.4	99.5	99.6	99.7	99.7	99.8	99.8	99.8	100.0	99.8	100.0	100.0	100.0	100.1	100.1	100.2	100.2	100.1	100.1	100.1	100.0
11	99.4	99.5	99.7	99.7	99.7	99.8	99.8	99.7	99.8	99.8	100.0	100.0	100.0	100.0	100.1	100.2	100.2	100.2	100.1	100.1	100.0
12	99.4	99.5	99.6	99.7	99.7	99.8	99.8	99.8	100.0	99.8	99.8	100.0	100.0	100.1	100.1	100.1	100.2	100.2	100.2	100.1	100.0
13	99.4	99.6	99.7	99.7	99.7	99.7	99.8	99.7	100.0	99.8	100.0	100.1	100.0	100.1	100.1	100.2	100.2	100.2	100.1	100.1	100.0
14	99.4	99.5	99.7	99.7	99.7	99.8	99.8	99.8	99.8	99.8	99.8	100.0	100.0	100.1	100.1	100.2	100.2	100.2	100.2	100.1	100.0
15	99.5	99.5	99.6	99.7	99.8	99.8	99.8	99.8	100.0	99.8	100.0	100.0	100.1	100.1	100.1	100.2	100.2	100.2	100.2	100.0	100.0
16	99.4	99.6	99.7	99.7	99.7	99.8	100.0	99.8	100.0	99.8	99.6	100.0	100.0	100.1	100.0	100.1	100.1	100.1	100.1	100.0	99.8
17	99.4	99.5	99.6	99.7	99.7	99.7	99.8	99.7	99.8	100.0	100.0	100.0	100.0	100.1	100.1	100.2	100.1	100.1	100.0	99.8	99.8
18	99.4	99.5	99.6	99.6	99.6	99.8	99.8	99.7	99.8	99.7	99.8	99.8	99.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
19	99.4	99.4	99.5	99.5	99.6	99.6	99.7	99.7	99.7	99.7	99.8	99.8	99.8	99.8	100.0	99.8	99.8	99.8	100.0	100.0	100.0
20	-99.5	99.5	99.5	99.4	99.5	99.5	99.6	99.5	99.6	99.6	99.6	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.8	100.0	100.1
21	-99.3	-99.4	99.3	99.2	99.3	99.4	99.3	99.3	99.4	99.4	99.4	99.4	99.5	99.5	99.5	99.5	99.6	99.7	99.8	100.1	-99.6

Distribution (Illumination) = 0.5%

Max Value = 100.2

Min Value = 99.2

INTENSITY	515	mw/cm ²
UNIFORMITY	0.5	%

Center Position Measurement Data

Lamp Input Power Uniformity Checker Light Integrator

1000 W 378.0 mW/cm² 383.0 mW/cm²1500 W 512.0 mW/cm² 517.0 mW/cm²Machine Power 510.0 mW/cm² 515.0 mW/cm²

ILLUMINATION SYSTEM
LIGHT INTEGRATOR ACC.

Machine No: 512702		Date: 11 TH MARCH 1996
Customer: MIETEC		Engineer: DAY / FORDHAM
Model	☐ FPA-2000i1	Lamp time: 5.0 hr
	☐ FPA-2500i2	
	☒ FPA-2500i3	

Expo. time	Repeat.	Set err.
80 msec	0.16 %	0.03 %
250 msec	0.05 %	0.10 %
500 msec	0.04 %	0.05 %
1000 msec	0.04 %	0.00 %
Linearity		0.05 %
Overall accuracy		0.21 %

MASKING BLADE ACCURACY

Machine No: 512702

Date: 11TH MARCH 1996

Customer: MIETEC

Engineer: DAY / FORDHAM

Model

☐ FPA-2000i1

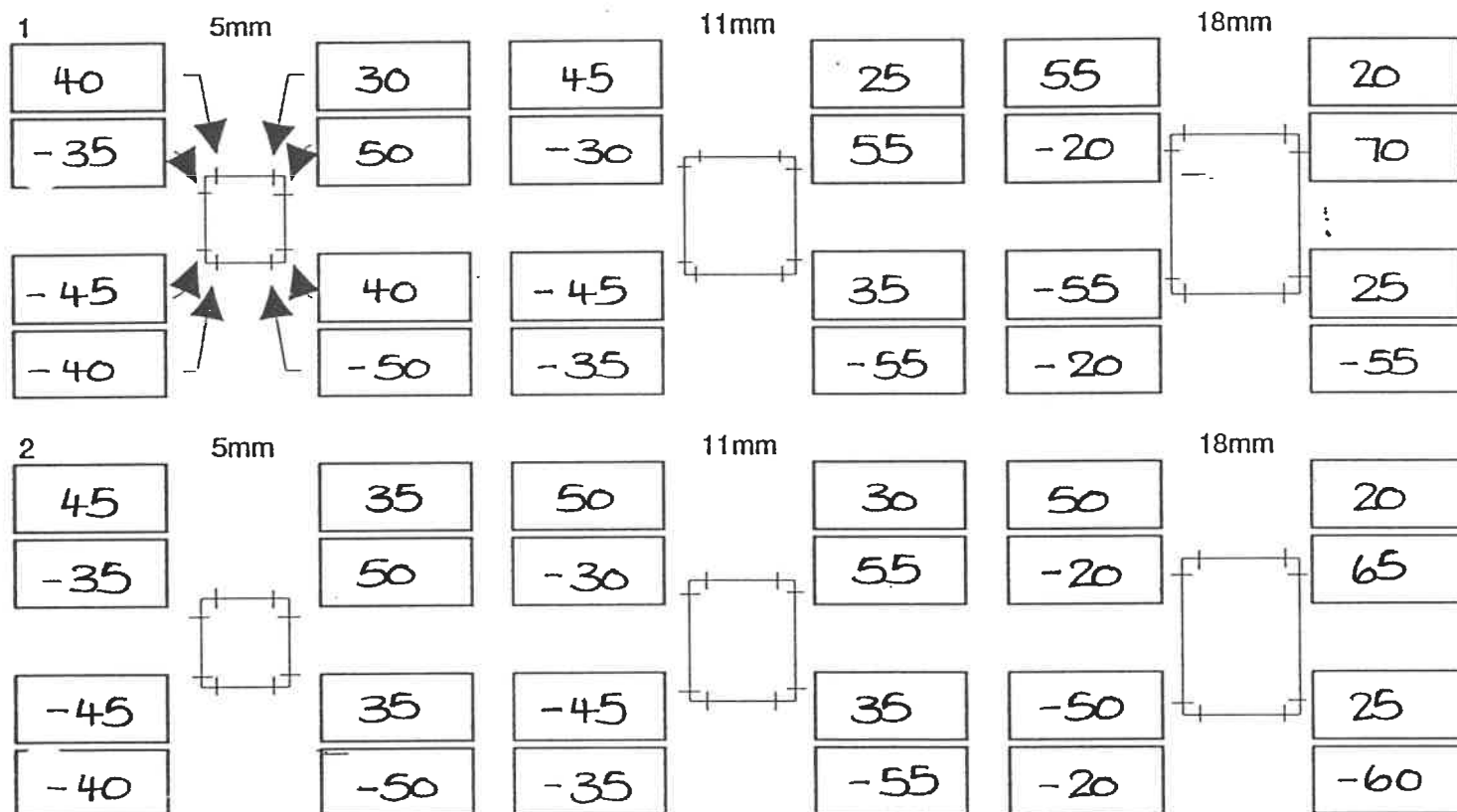
Reticle: 365

☐ FPA-2500i2

Wafer: SUPER FLAT

☒ FPA-2500i3

Wafer size: 6 inch



MAX	70	um
GREY ZONE	10	um

ROC MEASUREMENT STABILITY

Machine No: 512702

Date: 11TH MARCH 1996

Customer: MIETEC

Engineer: DAY / FORDHAM

Model

☐ FPA-2000i1

Reticle: 365

☐ FPA-2500i2

Wafer: _____

☒ FPA-2500i3

Wafer size: 6 inch

*** Reticle Offset Check ***

1. Data Acquisition (0:off, 1:on) ; 0

2. Repeat Count (1 - 255) ; 50

3. Delay Time (0 - 64) ; 0.000 s

*** Reticle Offset Check *** (unit : um)

1 X1= -.44 , Y1= -.11 , Xr= .74 , Yr= -.14
 2 X1= -.45 , Y1= -.13 , Xr= .72 , Yr= -.14
 3 X1= -.47 , Y1= -.12 , Xr= .76 , Yr= -.13
 4 X1= -.44 , Y1= -.12 , Xr= .73 , Yr= -.13
 5 X1= -.44 , Y1= -.12 , Xr= .71 , Yr= -.13
 6 X1= -.41 , Y1= -.13 , Xr= .72 , Yr= -.13
 7 X1= -.41 , Y1= -.12 , Xr= .74 , Yr= -.13
 8 X1= -.44 , Y1= -.13 , Xr= .71 , Yr= -.14
 9 X1= -.41 , Y1= -.13 , Xr= .75 , Yr= -.14
 10 X1= -.41 , Y1= -.13 , Xr= .74 , Yr= -.14
 11 X1= -.44 , Y1= -.12 , Xr= .71 , Yr= -.14
 12 X1= -.41 , Y1= -.12 , Xr= .75 , Yr= -.14
 13 X1= -.42 , Y1= -.12 , Xr= .73 , Yr= -.14
 14 X1= -.45 , Y1= -.12 , Xr= .71 , Yr= -.14
 15 X1= -.43 , Y1= -.12 , Xr= .73 , Yr= -.14
 16 X1= -.43 , Y1= -.12 , Xr= .74 , Yr= -.14
 17 X1= -.44 , Y1= -.12 , Xr= .72 , Yr= -.13
 18 X1= -.42 , Y1= -.12 , Xr= .73 , Yr= -.14
 19 X1= -.43 , Y1= -.12 , Xr= .73 , Yr= -.13
 20 X1= -.42 , Y1= -.13 , Xr= .76 , Yr= -.14
 21 X1= -.42 , Y1= -.12 , Xr= .75 , Yr= -.14
 22 X1= -.44 , Y1= -.12 , Xr= .71 , Yr= -.13
 23 X1= -.44 , Y1= -.12 , Xr= .70 , Yr= -.14
 24 X1= -.41 , Y1= -.12 , Xr= .75 , Yr= -.13
 25 X1= -.44 , Y1= -.12 , Xr= .72 , Yr= -.14
 26 X1= -.41 , Y1= -.12 , Xr= .72 , Yr= -.13
 27 X1= -.42 , Y1= -.12 , Xr= .73 , Yr= -.14
 28 X1= -.45 , Y1= -.12 , Xr= .71 , Yr= -.14
 29 X1= -.43 , Y1= -.12 , Xr= .71 , Yr= -.14
 30 X1= -.41 , Y1= -.12 , Xr= .77 , Yr= -.13
 31 X1= -.45 , Y1= -.12 , Xr= .73 , Yr= -.14
 32 X1= -.44 , Y1= -.11 , Xr= .72 , Yr= -.13
 33 X1= -.41 , Y1= -.12 , Xr= .74 , Yr= -.13
 34 X1= -.42 , Y1= -.12 , Xr= .74 , Yr= -.14
 35 X1= -.41 , Y1= -.12 , Xr= .76 , Yr= -.14
 36 X1= -.44 , Y1= -.12 , Xr= .72 , Yr= -.13
 37 X1= -.43 , Y1= -.13 , Xr= .71 , Yr= -.14
 38 X1= -.43 , Y1= -.12 , Xr= .74 , Yr= -.14
 39 X1= -.45 , Y1= -.12 , Xr= .70 , Yr= -.14
 40 X1= -.42 , Y1= -.12 , Xr= .72 , Yr= -.13
 41 X1= -.41 , Y1= -.13 , Xr= .75 , Yr= -.13
 42 X1= -.43 , Y1= -.14 , Xr= .74 , Yr= -.13
 43 X1= -.41 , Y1= -.12 , Xr= .75 , Yr= -.13
 44 X1= -.43 , Y1= -.12 , Xr= .73 , Yr= -.13
 45 X1= -.41 , Y1= -.12 , Xr= .75 , Yr= -.14
 46 X1= -.42 , Y1= -.13 , Xr= .75 , Yr= -.14
 47 X1= -.44 , Y1= -.13 , Xr= .72 , Yr= -.14
 48 X1= -.42 , Y1= -.12 , Xr= .71 , Yr= -.14
 49 X1= -.43 , Y1= -.12 , Xr= .73 , Yr= -.14
 50 X1= -.42 , Y1= -.12 , Xr= .76 , Yr= -.13

* EFFICIENT DATA COUNT ; 50

* MAX ; X1= -.41 , Y1= -.11 , Xr= .77 , Yr= -.13

* MIN ; X1= -.47 , Y1= -.14 , Xr= .70 , Yr= -.14

* RANGE ; X1= .06 , Y1= .03 , Xr= .07 , Yr= .01

* AVERAGE ; X1= -.43 , Y1= -.12 , Xr= .73 , Yr= -.14

* 3-SIGMA ; X1= .04 , Y1= .02 , Xr= .05 , Yr= .01

X-10

	XL	YL	XR	YR
3sig	0.004	0.002	0.005	0.001

RETICLE ROTATION	Machine No: 712502		Date: 13 - March - 1996	
	Customer: Mitec Fab 2		Engineer: DAY - FORDHAM	
	Model	☐ FPA-2000i1	Reticle: 365	
		☐ FPA-2500i2	Wafer: Super Flat	
	☐ FPA-2500i3	Wafer size: 6 inch		

AVE.		1	2	3	4	5
Y1	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.005	0.0	0.0	0.0	0.0	0.025
Y3	0.005	0.0	0.025	0.0	0.0	0.0
Y4	0.005	0.0	0.0	0.0	0.0	0.025
Y5	0.02	0.025	0.025	0.025	0.025	0.0
Y	0.007					

ACCURACY	Y/2	0.0035 um
REPEATABILITY	Y/2 Range (n=1-5)	0.010 um

FOCUS AND TILT MEASUREMENT STABILITY

Machine No:	512702	Date:	11 TH MARCH 1996
Customer:	MIETEC	Engineer:	DAY / FORDHAM
Model	☐ FPA-2000i1	Reticle:	365
	☐ FPA-2500i2	Wafer:	SUPERFLAT
	☒ FPA-2500i3	Wafer size:	6 inch

5 channels

focus *- tilt*

===== D D T 精度 オートフォーカス計測安定性 =====

No	C1(um)	C2(um)	C3(um)	C4(um)	C5(um)	FC(um)	X(ppm)	Y(ppm)
1	0.039	0.043	0.060	0.039	0.035	0.024	2.13	2.56
2	0.028	0.033	0.044	0.053	0.039	0.027	1.94	2.43
3	0.050	0.061	0.071	0.059	0.042	0.038	2.58	2.81
MAN	0.050	0.061	0.071	0.059	0.042	0.038	2.58	2.81

===== D D T フォーカスレベリング駆動再現性 =====

Focus measurement stability	3sig 0.038 um
Tilt compensation measurement stability	3sig X 2.58 μ MT PPM. 3sig Y 2.81 μ MT PPM.

FOCUS AND TILT
MEASUREMENT REPEATABILITY

Machine No:	512702	Date:	11 TH MARCH 1996
Customer:	MIETEC	Engineer:	DAY / FORDHAM
Model	☐ FPA-2000i1	Reticle:	365
	☐ FPA-2500i2	Wafer:	SUPERFLAT
	☒ FPA-2500i3	Wafer size:	6 inch

COUNT	45	45	45	45	45	45	45	45 (M M M M M)
MAX	0.47	0.29	0.38	0.31	0.45	0.05	1.9	1.6
MIN	-0.37	-0.44	-0.60	-0.38	-0.40	-0.04	-2.8	-2.9
RNG	0.84	0.73	0.98	0.69	0.85	0.09	4.7	4.5
AVE	-0.01	-0.04	0.11	-0.02	-0.02	0.00	-0.7	-0.2
3SIG	0.43	0.42	0.71	0.41	0.44	0.06	3.7	3.4

5ch

COUNT	45	45	45	45	45	45	45	45 (M M M M M)
MAX	0.52	0.29	0.34	0.30	0.51	0.08	2.2	1.4
MIN	-0.38	-0.43	-0.68	-0.40	-0.36	-0.04	-3.2	-2.7
RNG	0.90	0.72	1.02	0.70	0.87	0.12	5.4	4.1
AVE	0.01	-0.04	0.06	-0.02	0.01	0.01	-0.7	-0.5
3SIG	0.42	0.39	0.63	0.38	0.41	0.09	3.7	3.0

COUNT	45	45	45	45	45	45	45	45 (M M M M M)
MAX	0.26	0.25	0.35	0.30	1.68	0.09	2.6	2.1
MIN	-0.39	-0.40	-0.71	-0.33	-0.39	-0.05	-3.3	-3.3
RNG	0.65	0.65	1.06	0.63	2.07	0.14	5.9	5.4
AVE	-0.01	-0.02	0.05	-0.01	0.02	0.01	-0.7	-1.4
3SIG	0.39	0.36	0.63	0.36	0.84	0.08	3.3	3.4

D D T GLOBAL TILT 計測再現性

1# 3shots 45X ~~shots~~

? 3# 1shot

Focus measurement	3sig 0.09 um
repeatability	
Tilt compensation	3sig X 3.7 um PPM
measurement repeatability	3sig Y 3.4 um PPM

STEPPING
ACCURACY

Machine No: 512702		Date: 13 TH MARCH 1996
Customer: MIETEC		Engineer: DAY/FORDHAM
Model	☐ FPA-2000i1	Reticle: 365
	☐ FPA-2500i2	Wafer: GLASS
	☒ FPA-2500i3	Wafer size: 6 inch

<< Step calculation >>

X-mag. err : 4.60 ppm
Y-mag. err : 5.32 ppm
X-rot. err : .94 ppm
Y-rot. err : -.86 ppm
Random-X : .082 um
Random-Y : .058 um
Ortho. err : -1.80 ppm

1/100 um

Glass Wafer S.N.42 - XYSA = Stage offset.

$$4.4 - 4.6 = 0.2 \text{ ppm}$$

$$4.9 - 5.32 = 0.42 \text{ ppm}$$

$$-1.7 - -1.8 = 0.1 \text{ ppm}$$

+ SEQ NO. 001E Main sequence & AF await START.

VS5.23A

+

XYSA

+

1005.7mb 96/03/13 14:59:02

ORTHO.		0.10 ppm
MAG.	X	0.20 ppm
MAG.	Y	0.42 ppm

Canon FPA DATA SHEET

STEPPING ACCURACY

Machine No **512702**

Date

Customer **MIETEC**

Engineer **DAY / FORDHAM**

Model

- ☐ FPA-2000i1
☐ FPA-2500i2
☒ FPA-2500i3

Reticle **365**

Wafer **SUPERFLAT**

Wafer Size **6** inch

Wafer 1

Shot No.	CLM	ROW	X	Y	Shot No.	CLM	ROW	X	Y	Shot No.	CLM	ROW	X	Y	Shot No.	CLM	ROW	X	Y
1.	6	8	.054	99.990	1.	6	8	99.990	.023	1.	6	8	99.990	0.000	1.	6	8	.023	99.990
2.	5	8	.048	99.990	2.	5	8	99.990	.010	2.	5	8	99.990	-.002	2.	5	8	.036	99.990
3.	4	8	.048	99.990	3.	4	8	99.990	.011	3.	4	8	99.990	-.003	3.	4	8	.027	99.990
4.	3	8	-----	99.990	4.	3	8	99.990	-----	4.	3	8	99.990	.004	4.	3	8	.042	99.990
5.	2	7	-----	99.990	5.	2	7	99.990	-----	5.	2	7	99.990	-.004	5.	2	7	.059	99.990
6.	3	7	.058	99.990	6.	3	7	99.990	.002	6.	3	7	99.990	0.000	6.	3	7	.062	99.990
7.	4	7	.052	99.990	7.	4	7	99.990	.011	7.	4	7	99.990	-.008	7.	4	7	.056	99.990
8.	5	7	.051	99.990	8.	5	7	99.990	.013	8.	5	7	99.990	-.001	8.	5	7	.053	99.990
9.	6	7	.042	99.990	9.	6	7	99.990	.020	9.	6	7	99.990	.004	9.	6	7	.063	99.990
10.	7	7	.057	99.990	10.	7	7	99.990	.003	10.	7	7	99.990	-.008	10.	7	7	.059	99.990
11.	8	6	.051	99.990	11.	8	6	99.990	.005	11.	8	6	99.990	-.005	11.	8	6	.045	99.990
12.	7	6	.053	99.990	12.	7	6	99.990	.009	12.	7	6	99.990	.004	12.	7	6	.039	99.990
13.	6	6	.051	99.990	13.	6	6	99.990	.015	13.	6	6	99.990	0.000	13.	6	6	.048	99.990
14.	5	6	.061	99.990	14.	5	6	99.990	.010	14.	5	6	99.990	.001	14.	5	6	.038	99.990
15.	4	6	.046	99.990	15.	4	6	99.990	.004	15.	4	6	99.990	-.013	15.	4	6	.041	99.990
16.	3	6	.059	99.990	16.	3	6	99.990	.002	16.	3	6	99.990	.009	16.	3	6	.025	99.990
17.	2	6	.037	99.990	17.	2	6	99.990	-.002	17.	2	6	99.990	-.017	17.	2	6	.039	99.990
18.	1	6	-----	99.990	18.	1	6	99.990	-----	18.	1	6	99.990	-.005	18.	1	6	.042	99.990
19.	1	5	-----	99.990	19.	1	5	99.990	-----	19.	1	5	99.990	.004	19.	1	5	.059	99.990
20.	2	5	.051	99.990	20.	2	5	99.990	.005	20.	2	5	99.990	-.001	20.	2	5	.056	99.990
21.	3	5	.050	99.990	21.	3	5	99.990	.007	21.	3	5	99.990	-.014	21.	3	5	.055	99.990
22.	4	5	.053	99.990	22.	4	5	99.990	.011	22.	4	5	99.990	-.004	22.	4	5	.053	99.990
23.	5	5	.046	99.990	23.	5	5	99.990	.020	23.	5	5	99.990	-.003	23.	5	5	.056	99.990
24.	6	5	.053	99.990	24.	6	5	99.990	.013	24.	6	5	99.990	-.003	24.	6	5	.062	99.990
25.	7	5	.047	99.990	25.	7	5	99.990	.005	25.	7	5	99.990	-.002	25.	7	5	.055	99.990
26.	8	5	.050	99.990	26.	8	5	99.990	.015	26.	8	5	99.990	-.003	26.	8	5	.059	99.990
27.	8	4	.062	99.990	27.	8	4	99.990	.001	27.	8	4	99.990	.004	27.	8	4	-----	99.990
28.	7	4	.052	99.990	28.	7	4	99.990	.004	28.	7	4	99.990	-.008	28.	7	4	.053	99.990
29.	6	4	.052	99.990	29.	6	4	99.990	-.001	29.	6	4	99.990	-.003	29.	6	4	.053	99.990
30.	5	4	.046	99.990	30.	5	4	99.990	.017	30.	5	4	99.990	0.000	30.	5	4	.053	99.990
31.	4	4	.045	99.990	31.	4	4	99.990	.005	31.	4	4	99.990	.005	31.	4	4	.035	99.990
32.	3	4	.042	99.990	32.	3	4	99.990	.002	32.	3	4	99.990	-.001	32.	3	4	.046	99.990
33.	2	4	.048	99.990	33.	2	4	99.990	-.013	33.	2	4	99.990	-.002	33.	2	4	.022	99.990
34.	1	4	-----	99.990	34.	1	4	99.990	-----	34.	1	4	99.990	-.001	34.	1	4	.048	99.990
35.	1	3	-----	99.990	35.	1	3	99.990	-----	35.	1	3	99.990	-----	35.	1	3	-----	99.990
36.	2	3	.040	99.990	36.	2	3	99.990	0.000	36.	2	3	99.990	.005	36.	2	3	.055	99.990
37.	3	3	.054	99.990	37.	3	3	99.990	.008	37.	3	3	99.990	.003	37.	3	3	.056	99.990
38.	4	3	.049	99.990	38.	4	3	99.990	.018	38.	4	3	99.990	-.001	38.	4	3	.053	99.990
39.	5	3	.044	99.990	39.	5	3	99.990	0.000	39.	5	3	99.990	0.000	39.	5	3	.051	99.990
40.	6	3	.043	99.990	40.	6	3	99.990	.006	40.	6	3	99.990	-.003	40.	6	3	.056	99.990
41.	7	3	.045	99.990	41.	7	3	99.990	0.000	41.	7	3	99.990	-.006	41.	7	3	.043	99.990
42.	8	3	.047	99.990	42.	8	3	99.990	.013	42.	8	3	99.990	-----	42.	8	3	-----	99.990
43.	7	2	.044	99.990	43.	7	2	99.990	-.004	43.	7	2	99.990	-----	43.	7	2	-----	99.990
44.	6	2	.039	99.990	44.	6	2	99.990	.003	44.	6	2	99.990	-.004	44.	6	2	.044	99.990
45.	5	2	.048	99.990	45.	5	2	99.990	.006	45.	5	2	99.990	-.010	45.	5	2	.031	99.990
46.	4	2	.027	99.990	46.	4	2	99.990	.001	46.	4	2	99.990	0.000	46.	4	2	.037	99.990
47.	3	2	.056	99.990	47.	3	2	99.990	-.001	47.	3	2	99.990	.006	47.	3	2	.037	99.990
48.	2	2	-----	99.990	48.	2	2	99.990	-----	48.	2	2	99.990	-----	48.	2	2	-----	99.990
49.	3	1	-----	99.990	49.	3	1	99.990	-----	49.	3	1	99.990	-----	49.	3	1	-----	99.990
50.	4	1	.051	99.990	50.	4	1	99.990	.007	50.	4	1	99.990	-----	50.	4	1	-----	99.990

51.	5	1	.043	99.990	51.	5	1	99.990	.005	51.	5	1	99.990	-----	51.	5	1	-----	99.990				
52.	6	1	.047	99.990	52.	6	1	99.990	-.009	52.	6	1	99.990	-----	52.	6	1	-----	99.990				
AVE			.049	99.990	AVE			XY	99.990	.006	AVE			99.990	-.002	AVE			.047	99.990			
RANGE			.035	99.990	RANGE				99.990	.036	RANGE			99.990	.026	RANGE			.041	99.990			
3 SIG			XX	.020	99.990	3 SIG				99.990	.023	3 SIG			YY	99.990	.016	3 SIG			YX	.033	99.990

xx -> yx

stepping

	X-X	X-Y	Y-X	Y-Y	
AVE	0.049	0.006	0.047	0.002	μm
3σ	0.020	0.023	0.033	0.016	

THROUGHPUT ☒ He-Ne TV (MODE1) Die by Die OFF 632-20i	Machine No: 512702		Date: 18TH MARCH 1996
	Customer: MIETEC		Engineer: DAY / FORDHAM
	Model	☐ FPA-2000i1	Reticle: 365
		☐ FPA-2500i2	Wafer: SUPERFLAT
	☒ FPA-2500i3	Wafer size: 6 inch	

mode 1 / mode 3

WAFER No.	INDEX TIME	
1	48182	msec
2	48136	msec
3	48099	msec
Average	48139	msec

THROUGHPUT = $\frac{3600000}{\text{AVERAGE } 48139}$ = **74.8** (Wafer/hr)

wno	-	uload_wafer	load_wafer	tv_pre_align	aga	index [ms]
1,		4405,	34784,	9138,	64004,	131210
2,		4404,	10254,	2092,	12267,	48182
3,		4411,	10243,	2090,	12223,	48136
4,		4387,	10280,	2076,	12182,	48099

THROUGHPUT **75** Wafer/hr

ec #512702i3 Coma Check

MAG: 50.0K<P: 25.0K>
HV: 800V Ie: 6.0uA R: 91.8deg
MAG: 50.0K<P: 25.0K>
HV: 800V Ie: 6.0uA R: 92.2deg

FPA-2500i3 #Z02 MIETEC
-0.30um FOCUS 0.60um L&S DC-H
MAG: 50.0K<P: 25.0K>
HV: 800V Ie: 5.4uA R: 92.0deg
FPA-2500i3 #Z02 MIETEC
-0.30um FOCUS 0.60um L&S CC-H
MAG: 50.0K<P: 25.0K>
HV: 800V Ie: 6.0uA R: 92.0deg
FPA-2500i3 #Z02 MIETEC
-0.30um FOCUS 0.60um L&S UC-H
MAG: 50.0K<P: 25.0K>
HV: 800V Ie: 5.6uA R: 91.8deg

FPA-2500i3 #Z02 MIETEC
-0.30um FOCUS 0.60um L&S DR-H
FPA-2500i3 #Z02 MIETEC
-0.30um FOCUS 0.60um L&S CR-H
FPA-2500i3 #Z02 MIETEC
-0.30um FOCUS 0.60um L&S UR-H

Chris Howells

Canon Europa AED