

Set-up Report (Config & Lens Data)

Basic Config	SMIF/Non-SMIF type	☐ Non-SMIF ☒ SMIF
	Automation Online	☒ SECE I/II ☐ GEM
	Component	☐ No
	Wafer Size	200mm
	Reticle Size	8 inch
	WH type	Edge sensor (Notch / Flat All available)
Software	Inline Flow	☒ Right ☐ Left
	Main computer type	SUN ULTRA-10 (HDD include)
	SoftWare version:	8.9.0 C
WL & RL	Y2K completion	☒ Yes ☐ No
	WL Type	☐ Type 3 ☐ Others:
	WL Port Number	☒ 1 ☒ 2 ☐ No ☐ Others:
	RL Library	☐ Right ☐ Left ☐ Center [ARMS Type]
Lens & Illumination	PPD Type (Arms)	IRIS Type: PPD (Library 1, 2 type)
	Lens Type:	☐ 4eN2 ☒ Other :
	Max NA	☐ 0.68 ☒ Other : 0.7
	Bottom module type	Aerial 1
	Illumination Apperture Type	☐ 0- order cut ☐ 0- order not cut
Stage	SCAN Speed	☒ 250mm/sec ☐ Others:320mm/sec
	Chuck	☒ Pin chuck ☐ Ring chuck
	Focus Calibration Function	☐ FC2 ☐ AIS ☐ No ☐ Others: [IQC type]

■ Configuration (Other info)

	Items for scanner	Exist	Remark
1	Machine type		PAS 5500 /400D
2	Machine serial number		S/N : 5393
4	Vintage		2004-07-29
5	Exposure Unit check	Yes	Off-axis aligne option /i-Line Sanner
7	Aerial I, Bottom Module	Yes	No missing (3500W Lamp)
8	S&T Cabinet	Yes	OK (ASML original 2500KW)
10	OCU	Yes	OK (ULTRA 10)
11	Electronics Cabinet	Yes	No missing
13	Wafer Transport System (Wafer handling)	Yes	No missing
14	Air Control Cabinet	Yes	No missing
16	Scanning Wafer Stage	Yes	No missing
17	ARMS	Yes	IRIS type : PPD (Library 1,2 type)
19	Reticle Stage Chunks	Yes	OK
20	Machine Covers cart (Panel Cart)	Yes	No missing
22	All hose	Yes	OK

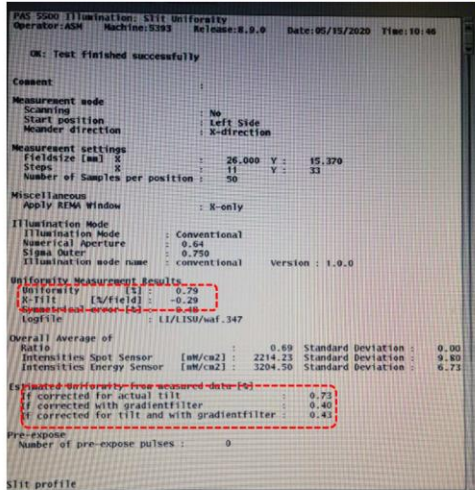
■ Data

Machine No 5393 / S/W : 8.9.0c (Date : 2020.05.25)

1	Illumination and dose control	Spec	Data	Remark
1.1	Illumination Uniformity	< 1.2	0.79	
	If make g-filter, can improve 0.40			
1.2	Illumination Intesity	> 2900	3204.5	
1.3	Dose repeatability and accuracy	Repet < 0.7	0.16	
2	Image performance			
2.1	FPD (Fmage Plane Deviation)	< 250	229	
2.2	Astigmatism	< 150	131	
3	Image distortion			
3.1	NCE (Lens distortion)	< 35	X: 29.1 / Y: 11.1	
4	Focus and levelling			
4.1	Total leveling repeatability	< 60	15.2	
5	Overlay performance			
5.1	MA X & Y	< 10	X: 0.9 / Y: 0.9	
5.2	MSD X & Y	< 20	X: 7.8 / Y: 6.0	
5.3	SMO (Single Machine Overlay)	< 45	X: 12.1 / Y: 8.9	
6	Image quality control			
6.1	Focus repeatability	< 50	-1.46	
	Image tilt repeatability	< 6.0	0.22	
	Translation repeatability	< 15	0.01	
	Magnification repeatability	< 1.0	-0.04	
	Marker rotation repeatability	< 1.0	-0.08	
7	Stage accuracy			
7.1	Stage repeatability	< 15	X: 7.0 / Y: 4.9	

■ Uniformity : 0.79% (Spec : < 1.2 %)

→ If correction for tilt with gradient filter : 0.40%



■ Level sensor repeatability (3-sigma) : 15.2 nm (Spec : < 50nm)

Absolute results

	Z [um]	Rx [urad]	Ry [urad]	TotZ [um]
Avg	190.2048	-3.6436	167.3572	192.3569
Max	190.2326	-2.3610	168.7112	192.3920
Min	190.1712	-5.4626	165.5259	192.3042
Max-Min	0.0614	3.1016	3.1853	0.0878
Stddev	0.0123	0.5331	0.5625	0.0152

■ SMO (Single Machine Overlay) : X 12.1 / Y 8.9 nm (Spec : < 45nm)

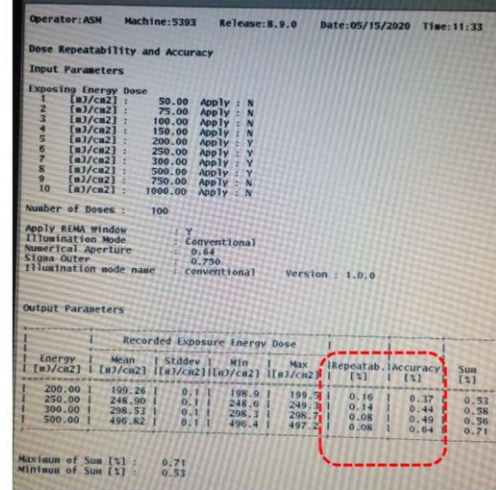
Filtered Overlay Error				
	X [nm]	Y [nm]	Vector [nm]	
Mean	-3.9	2.1		
St. Dev.	3.2	2.4		
Mean + 3 Sigma	13.5	9.4		
Maximum 99.7%	12.1	8.9		13.9

■ IPD (Image Plane Deviation) : 229 nm (Spec : < 250nm)

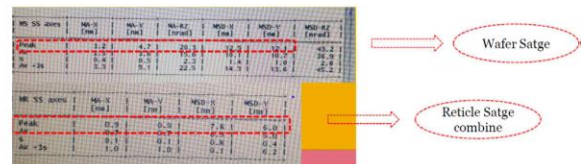
■ Astigmatism : 131nm (Spec : < 150 nm)

	Mean [nm]	Std. Dev. [nm]
Image plane deviation	229	0.1
Astigmatism	131	0.1

■ Dose Repeatability : Repeatability 0.16% / Accuracy 0.64% (Spec : Repeatability < 0.7 % / Accuracy < 3%)



■ Wafer Stage Horizontal Servo Performance : MA : 3.2 / 4.7 , MSD : 12.5 / 12.1 (Spec : MA < 10 nm / MSD < 20 nm)



■ Stage Accuracy : X 7.0 / 4.9 (Spec : < 15 nm)

Filtered Overlay Error				
	X [nm]	Y [nm]	Vector [nm]	
Mean	0.3	0.2		
St. Dev.	1.8	1.7		
Mean + 3 Sigma	5.6	5.2		
Maximum 99.7%	7.0	4.9		7.6

■ Image Distortion (NCE) : X 29.1 / Y 11.1 nm (Spec : < 35nm)

	Mean [nm]	Std. Dev. [nm]
image distortion (NCE) x	29.1	14.1
image distortion (NCE) y	11.1	12.8

■ IQC (Image Quality Control)

Image Quality Control - Metrology Verification
Operator: ASM Machine: 5393 Release: 8.9.0 Date: 05/11/2020 Time: 14:15

Results of the Correction Measurements

```
Type of Correction Measurement : System Correction
Update mode                    : Measure
```

```

Lens Pressure      [mbar] : 1006.5
Lens Temperature   [degC] : 22.0
Illumination Mode  : Conventional
Numerical Aperture : 0.62
Sigma Outer        : 0.650
Illumination mode name : conventional
Version : 1.0.0

```

```
Global Alignments per Measurement : 1
Cycles per Measurement             : 1
Measurements per Correction        : 1
```

Correction Measurements done : 3 valid : 3 requested : 3

Drift Data

		IQ drift	Correction		IQ drift	
		Start MC	Mean	3StdDev	Valid	New MC
Magnification	[ppm]	0.00	-0.04	0.23	Y	0.00
Rotation	[urad]	0.00	-0.08	0.16	Y	0.00
Translation X	[nn]	0.00	-1.23	3.63	Y	0.00
Translation Y	[nn]	0.00	-0.94	1.62	Y	0.00
Image Tilt Rx	[urad]	0.00	0.22	1.82	Y	0.00
Image Tilt Ry	[urad]	0.00	0.01	0.64	Y	0.00
Focus	[nn]	0.00	-1.46	9.40	Y	0.00
Field Curvature	[nm/cn2]	0.00	-4.28	8.49	Y	0.00
Stole Tilt Rx	[urad]	0.00	-1.21	0.67	Y	0.00
Stole Tilt Ry	[urad]	0.00	-0.82	0.46	Y	0.00
Actuator Tilt Rx	[urad]	0.00	-0.04	0.36	Y	0.00
Actuator Tilt Ry	[urad]	0.00	-0.42	0.35	Y	0.00

■ CM Option

```

FILE_TYPE 03
#do not change next line by hand!
MACHINE_NUMBER 5393
MACHINE_TYPE /400
COMMENT TZ=factory
SW_RELEASE 080900
#do not change next line by hand!
MAGIC_STRING NjYcWFU0{U}
#do not change next line by hand!
WAFER_STEPPER
OPTIONS
SECS KEY xyKNPO{C5}I
ARMS KEY pS4m6FPznP{
SINGLE_RETICLE_SMIF KEY lgtIIR6kj85
PEP_1_PRODUCTIVITY_UPGRADE KEY EevvIftzJ0j
RETICLE_ERROR_COMPENSATION KEY aj9vMVMFY8K
FLATNESS_MODEL KEY 8PoxRpyKoEb
LSQ_DISTO_MODEL KEY IXIba87wxRx
MARK_SENSOR KEY ElVc1QrtW4h
BATCH_STREAMING KEY lgK4iFPz6CU
AERIAL KEY VumLlxOG7Iy
IRIS KEY yrFS2RPiIfp
FOCAL_ADJUSTMENT KEY lgK48HJzE{U
RETICLE_CD_CONTROL KEY luCTzx0m7my
EXTENDED_EXPOSURE KEY ReQnION8vxI
TIS KEY 8OP6lFHemVs
ATHENA KEY RiEotfJ3PnI1
FAST_TTL_ALIGNMENT KEY ovRTQFHCHCb
PHASE_MODULATOR_FTTL KEY I1825hMlvmb
PHASE_MODULATOR_OA KEY CaIQGwRXlTP
SLOT_INTEGRITY KEY lCPy9jEFY84
PEP_B1_PRODUCTIVITY_UPGRADE KEY ddnxuVzY07C
RETICLE_BLUE_ALIGN KEY OvRtoFH4Gyb
COMPACT_LAMP KEY oLBcairIjgZ
ZERO_FIRST_OPTIMISATION KEY tVgI1k0VNo2
STEP_IMPROVEMENT_Q101 KEY n0yC70Fpe1a
PEP_WAFER_SWAP_1 KEY NqmtY7ihIq?
SUPPORT_WPMCA KEY t18m03mwy9s
PEP_STEP_AND_EXPOSE_2 KEY 1rGc3FPnIfp
PEP_WAFER_SWAP_3 KEY xKX2nQyEIN1
WAFER_HANDLING_4 KEY pR2JnIRIRnZ
ALIGNMENT_REPORTS KEY GIE{I}110b4
ALIGNMENT_ORIO_ACCURACY KEY lchJcFqcaF8
STATIC_EXPOSURES KEY p0SEDQFp8Mc
ECHKUP_FLATNESS_QUALIFICATION KEY ITVICH3Uwea
ATHENA_ALIGN_RED_ONLY KEY VagI1kPeF7h
ANNULAR_ILLUMINATION KEY lchJ2LUccFv
ATHENA_ALIGN_HIGH_ORDERS KEY AS3wVpyagQr
SCRIBELANE_MARKS KEY Nuw2w0m9Qs
LIBRARY_CONFIG_2 KEY D2YXZKhQGNF
LIBRARY_CONFIG_3 KEY zcHCrsIXhZV
VISUAL_ALIGNMENT_CAMERA KEY lnsIIR3wIC1
MEASURE_RETICLE_TILT_BY_TIS KEY RIsSSdIFY04

```

■ Photo

