Nikon NSR-S204B

Lens Data Package

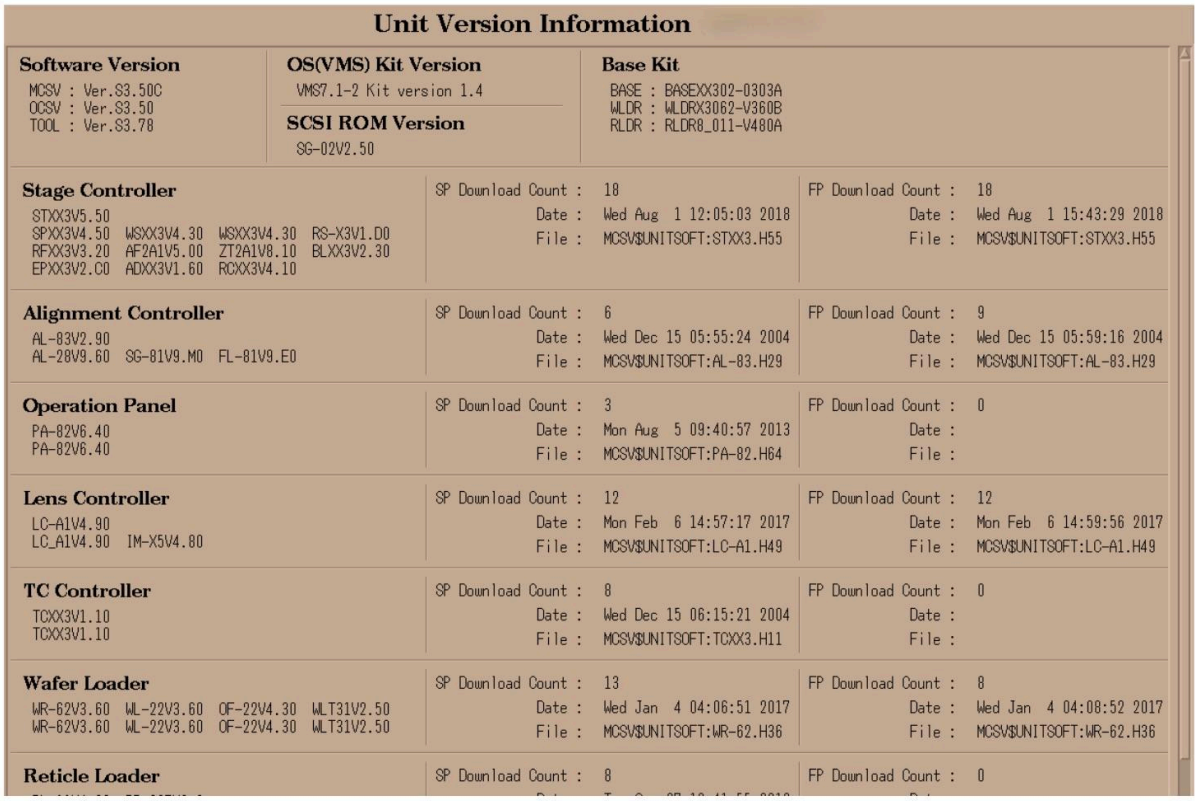
No	ITEM	SPEC	RESULT
1	Resolution (0.175um IsoLine) Conv NA/σ = 0.68/0.75	Customer Dependent based on CD Tolerance, SEM/15 Point in Field, V/H 0.175um Iso	Customer needs to calculate using Item2 DOF Data
2	DOF (0.175um IsoLine) Conv NA/σ = 0.68/0.75	Customer Dependent based on CD Tolerance, SEM/15 Point in Field, V/H 0.175um Iso	Customer needs to calculate
3	Linewidth Abnormality/COMA (0.175um L&S) Conv NA/σ = 0.68/0.44	[(L1 – L5) / (L1 + L5)] SEM/15 Point in Field, V/H 0.175um Iso	0.090 um
4	Total Focus Deviation Conv NA/σ = 0.68/0.75	(0.25μm L&S / 15Point V/H) Max-Min ≤ 0.20μm	0.195μm
5	Lens Astigmatisim Conv NA/σ = 0.68/0.75	(0.25μm L&S / 15Point V/H) |V-H| ≤ 0.20μm	0.111μm
6	Lens Dynamic Distortion Conv NA/σ = 0.68/0.75	X,Y = Within ±25nm	X = -17nm~21nm Y = -24nm~62nm
7	Lens Flare / IU Flare Conv NA/σ = 0.68/0.75	Customer Dependent	Lens Flare = 7.0% IU Flare = 2.26%
8	Wafer Flatness Accuracy	1) Flat Within ≥ Max-Min 3.0μm 2) L.F.S Within ≥ Max-Min 0.8μm	1. 1.02μm 2. 0.520μm
9	Exposure Power Conv NA/σ = 0.68/0.75	Within ≥ 700mW/cm2	837.89 mW/cm2
10	Illumination Uniformity Conv NA/σ = 0.68/0.75	Within ±2%	5.09%
11	Orthogonality Accuracy	Within ± 0.48urad	±.20urad
12	Stage Precision Accuracy 1) Stepping Accuracy 2) Backlash Accuracy	1) 3σ ≤ 25nm 2) 3σ ≤ 25nm	1. X: 14, 19, 17 Y: 7, 10, 10 2. X: 15, 13, 15 Y: 11, 11, 11
13	Wafer Pre-Alignment Repeatability	3σ≦15μm	X : 9.786 μm Y : 14.408 μm T : 19.794 μm

No	ITEM	SPEC	RESULT
14	Synchronization Accuracy 1) Mean 2) MSD	1) ≦10nm(-5nm ~ +5nm) 2) ≦ 25nm	1). X : 6nm, Y : 8nm 2). X : 20nm, Y : 20nm
15	AF Adjustment Result	PSD Max – Min ≤ 0.2μm	0.030μm
16	Integrator Accuracy	Target: 10, 20, 50, 100, 200mj/cm2 Ave ≤ 1.3%	Ave Max = 0.24%
17	Alignment Accuracy 1) FIA-EGA 2) LSA-EGA	FIA-EGA = |M| + 3σ ≤ 35nm LSA-EGA = |M| + 3σ ≤ 40nm	1) X = ±20nm Y = ±20nm 2) X= ±20nm Y = ±20nm

Software

MCSV Ver.S3.50C

OCSV Ver.S3.50



Unit Version Information

Software Version
MCSV : Ver.S3.50C
OCSV : Ver.S3.50
TOOL : Ver.S3.78

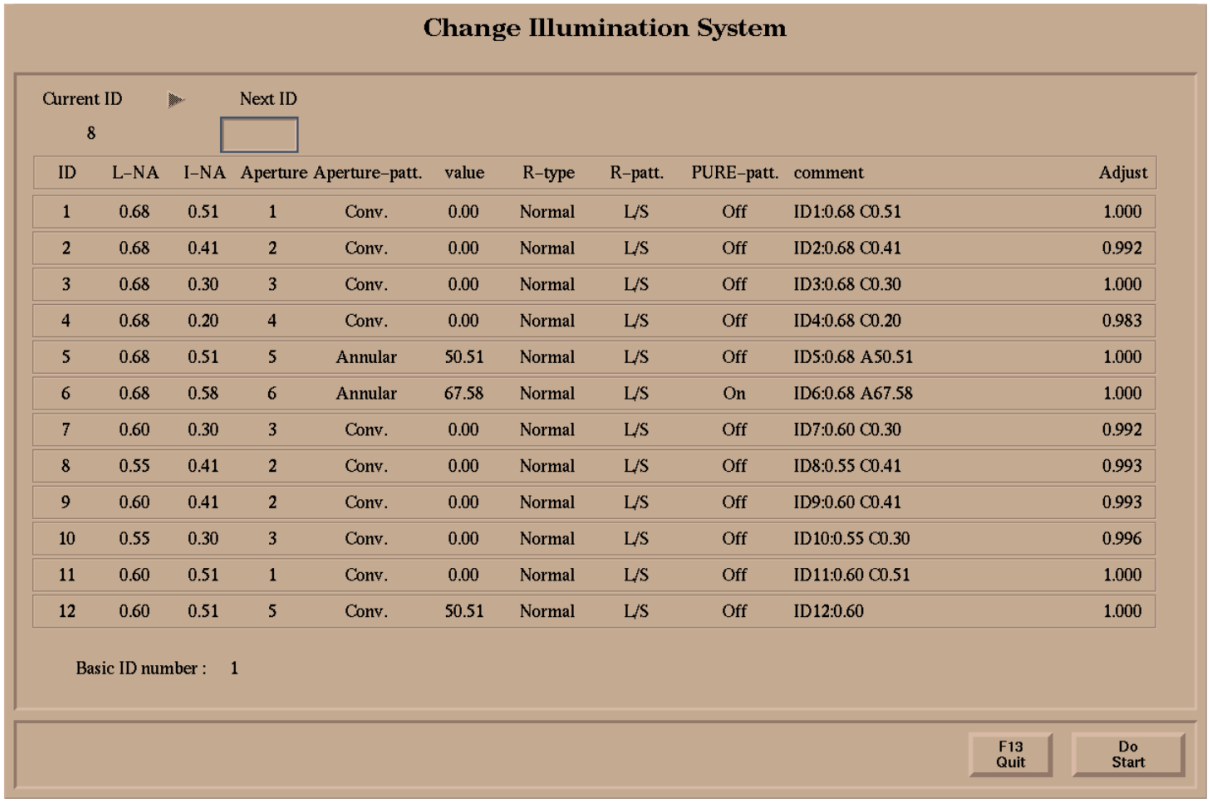
OS(VMS) Kit Version
VMS7.1-2 Kit version 1.4

SCSI ROM Version
SG-02V2.50

Base Kit
BASE : BASEXX302-0303A
WLDR : WLDRX3062-V360B
RLDR : RLDR8_011-V480A

		SP Download Count : 18 Date : Wed Aug 1 12:05:03 2018 File : MCSV$UNITSOFT:STXX3.H55	FP Download Count : 18 Date : Wed Aug 1 15:43:29 2018 File : MCSV$UNITSOFT:STXX3.H55
Stage Controller	STXX3V5.50 SPXX3V4.50 WSXX3V4.30 WSXX3V4.30 RS-X3V1.D0 RFXX3V3.20 AF2A1V5.00 ZT2A1V8.10 BLXX3V2.30 EPXX3V2.C0 ADXX3V1.60 RCXX3V4.10		
Alignment Controller	AL-83V2.90 AL-28V9.60 SG-81V9.M0 FL-81V9.E0	SP Download Count : 6 Date : Wed Dec 15 05:55:24 2004 File : MCSV$UNITSOFT:AL-83.H29	FP Download Count : 9 Date : Wed Dec 15 05:59:16 2004 File : MCSV$UNITSOFT:AL-83.H29
Operation Panel	PA-82V6.40 PA-82V6.40	SP Download Count : 3 Date : Mon Aug 5 09:40:57 2013 File : MCSV$UNITSOFT:PA-82.H64	FP Download Count : 0 Date : File :
Lens Controller	LC-A1V4.90 LC_A1V4.90 IM-X5V4.80	SP Download Count : 12 Date : Mon Feb 6 14:57:17 2017 File : MCSV$UNITSOFT:LC-A1.H49	FP Download Count : 12 Date : Mon Feb 6 14:59:56 2017 File : MCSV$UNITSOFT:LC-A1.H49
TC Controller	TCXX3V1.10 TCXX3V1.10	SP Download Count : 8 Date : Wed Dec 15 06:15:21 2004 File : MCSV$UNITSOFT:TCXX3.H11	FP Download Count : 0 Date : File :
Wafer Loader	WR-62V3.60 WL-22V3.60 OF-22V4.30 WLT31V2.50 WR-62V3.60 WL-22V3.60 OF-22V4.30 WLT31V2.50	SP Download Count : 13 Date : Wed Jan 4 04:06:51 2017 File : MCSV$UNITSOFT:WR-62.H36	FP Download Count : 8 Date : Wed Jan 4 04:08:52 2017 File : MCSV$UNITSOFT:WR-62.H36
Reticle Loader		SP Download Count : 8	FP Download Count : 0

Illumination System



Change Illumination System

Current ID 8 ▶ Next ID

ID	L-NA	I-NA	Aperture	Aperture-patt.	value	R-type	R-patt.	PURE-patt.	comment	Adjust
1	0.68	0.51	1	Conv.	0.00	Normal	L/S	Off	ID1:0.68 C0.51	1.000
2	0.68	0.41	2	Conv.	0.00	Normal	L/S	Off	ID2:0.68 C0.41	0.992
3	0.68	0.30	3	Conv.	0.00	Normal	L/S	Off	ID3:0.68 C0.30	1.000
4	0.68	0.20	4	Conv.	0.00	Normal	L/S	Off	ID4:0.68 C0.20	0.983
5	0.68	0.51	5	Annular	50.51	Normal	L/S	Off	ID5:0.68 A50.51	1.000
6	0.68	0.58	6	Annular	67.58	Normal	L/S	On	ID6:0.68 A67.58	1.000
7	0.60	0.30	3	Conv.	0.00	Normal	L/S	Off	ID7:0.60 C0.30	0.992
8	0.55	0.41	2	Conv.	0.00	Normal	L/S	Off	ID8:0.55 C0.41	0.993
9	0.60	0.41	2	Conv.	0.00	Normal	L/S	Off	ID9:0.60 C0.41	0.993
10	0.55	0.30	3	Conv.	0.00	Normal	L/S	Off	ID10:0.55 C0.30	0.996
11	0.60	0.51	1	Conv.	0.00	Normal	L/S	Off	ID11:0.60 C0.51	1.000
12	0.60	0.51	5	Conv.	50.51	Normal	L/S	Off	ID12:0.60	1.000

Basic ID number : 1

F13 Quit Do Start

1. Lens Resolution (2019):

Conv NA/σ = 0.68/0.75

(0.175µm Isolated / 15Point V/H)

SPEC: Customer Dependent based on CD Tolerance

Result: Customer Needs to Calculate (Use Item2 DOF CD's at Best Focus)

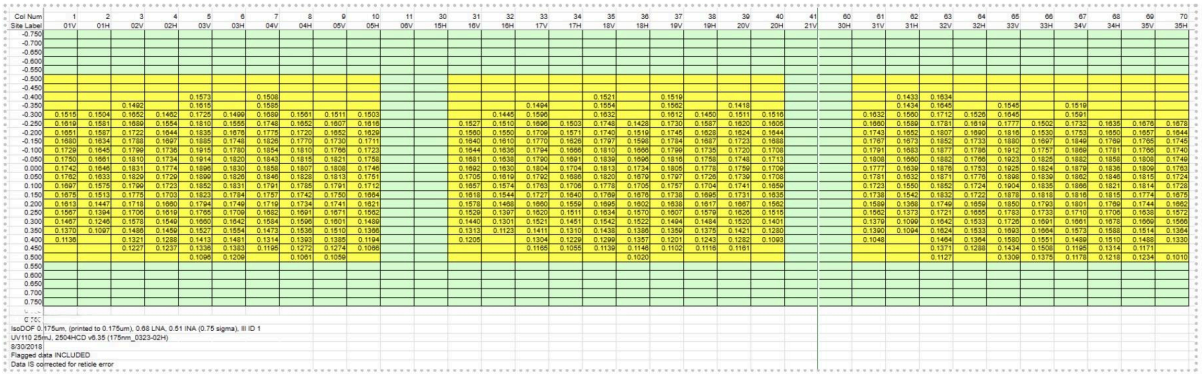
2. Depth of Focus (2019):

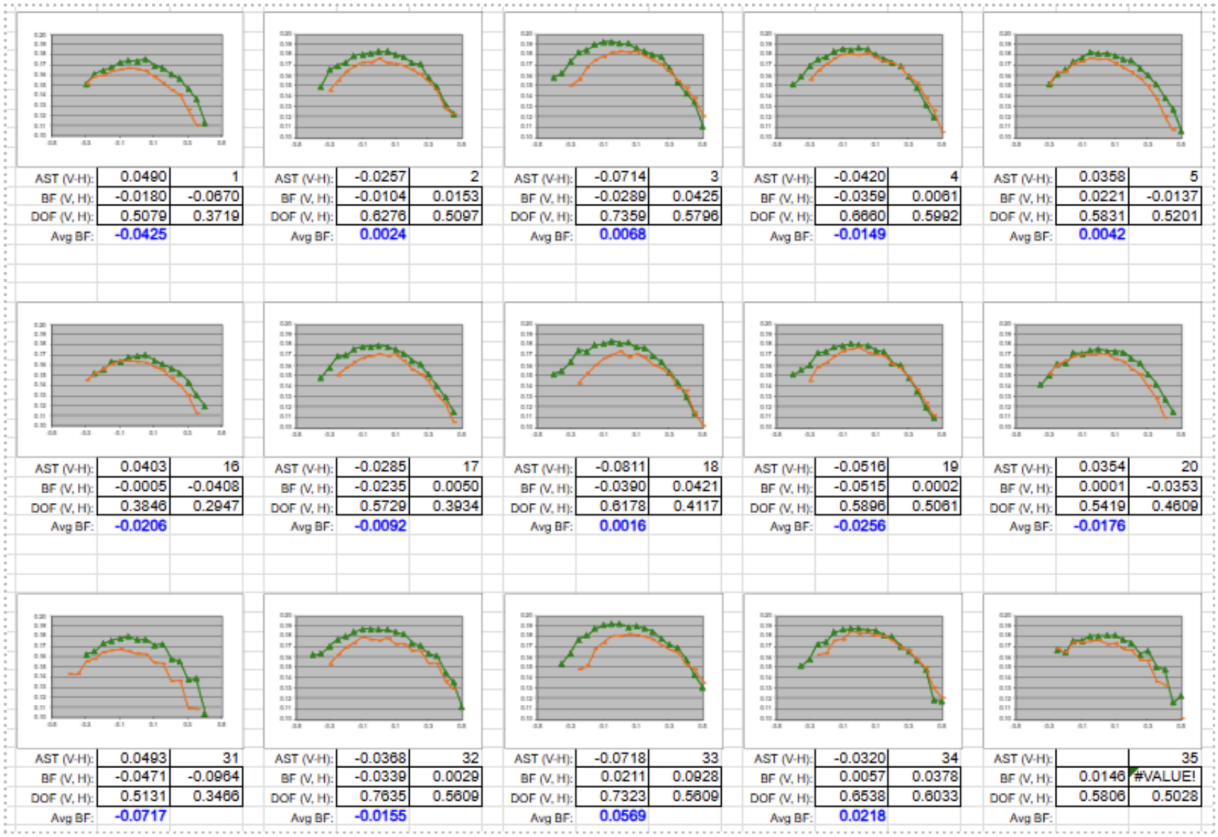
Conv NA/σ = 0.68/0.75

(0.175µm Isolated / 15Point V/H)

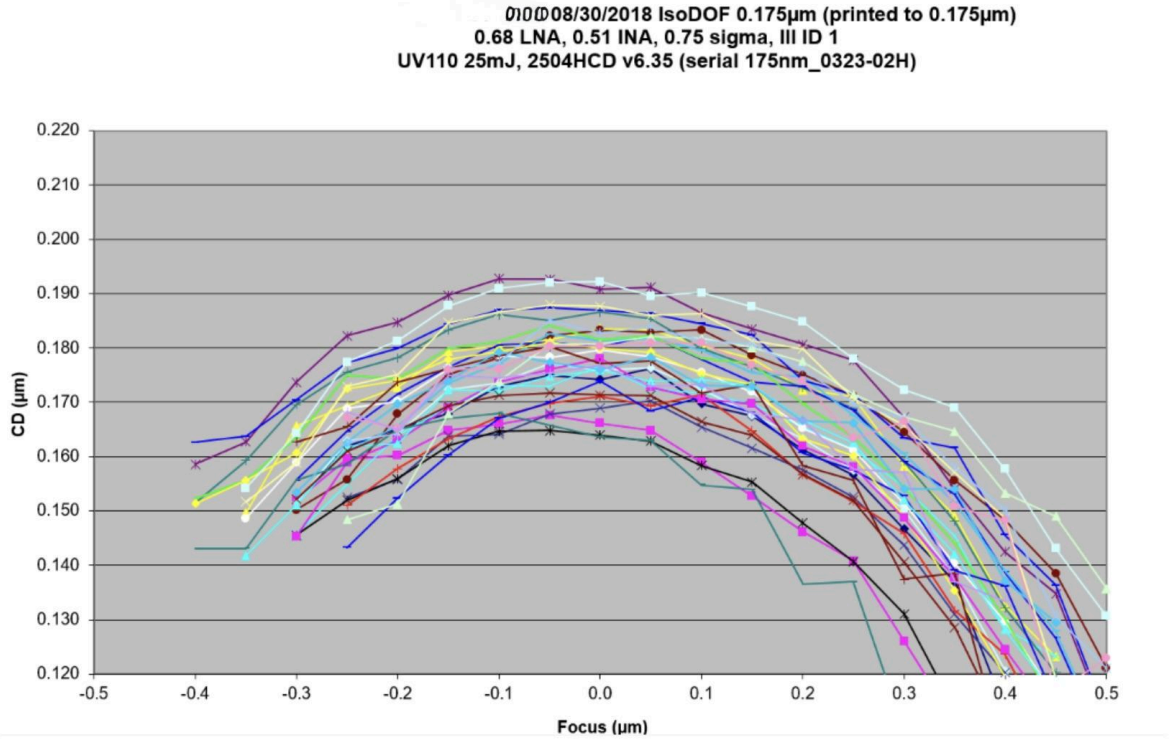
SPEC: Customer Dependent based on CD Tolerance

Result: Customer Needs to Calculate





AST (V-H):	0.0490	1	AST (V-H):	-0.0257	2	AST (V-H):	-0.0714	3	AST (V-H):	-0.0420	4	AST (V-H):	0.0358	5
BF (V, H):	-0.0180	-0.0670	BF (V, H):	-0.0104	0.0153	BF (V, H):	-0.0289	0.0425	BF (V, H):	-0.0359	0.0061	BF (V, H):	0.0221	-0.0137
DOF (V, H):	0.5079	0.3719	DOF (V, H):	0.6276	0.5097	DOF (V, H):	0.7359	0.5796	DOF (V, H):	0.6660	0.5992	DOF (V, H):	0.5831	0.5201
Avg BF:	-0.0425		Avg BF:	0.0024		Avg BF:	0.0068		Avg BF:	-0.0149		Avg BF:	0.0042	
AST (V-H):	0.0403	16	AST (V-H):	-0.0285	17	AST (V-H):	-0.0811	18	AST (V-H):	-0.0516	19	AST (V-H):	0.0354	20
BF (V, H):	-0.0005	-0.0408	BF (V, H):	-0.0235	0.0050	BF (V, H):	-0.0390	0.0421	BF (V, H):	-0.0515	0.0002	BF (V, H):	0.0001	-0.0353
DOF (V, H):	0.3846	0.2947	DOF (V, H):	0.5729	0.3934	DOF (V, H):	0.6178	0.4117	DOF (V, H):	0.5896	0.5061	DOF (V, H):	0.5419	0.4609
Avg BF:	-0.0206		Avg BF:	-0.0092		Avg BF:	0.0016		Avg BF:	-0.0256		Avg BF:	-0.0176	
AST (V-H):	0.0493	31	AST (V-H):	-0.0368	32	AST (V-H):	-0.0718	33	AST (V-H):	-0.0320	34	AST (V-H):		35
BF (V, H):	-0.0471	-0.0964	BF (V, H):	-0.0339	0.0029	BF (V, H):	0.0211	0.0928	BF (V, H):	0.0057	0.0378	BF (V, H):	0.0146	#VALUE!
DOF (V, H):	0.5131	0.3466	DOF (V, H):	0.7635	0.5609	DOF (V, H):	0.7323	0.5609	DOF (V, H):	0.6538	0.6033	DOF (V, H):	0.5806	0.5028
Avg BF:	-0.0717		Avg BF:	-0.0155		Avg BF:	0.0569		Avg BF:	0.0218		Avg BF:		



3. Linewidth Abnormality / COMA (2019):

Conv NA/σ = 0.68/0.44

(0.175µm L/S / 15Point V/H)

SPEC: 0.055µm (Customer Dependent)

Result: 0.090µm

WFR AVERAGE

Center Dose: 28mJ | Tool Name: U90V | Spec:(um) <= 0.055 | Best Dose: | Track Recipe: N01_LENSOP-LNK
Dose Step: 0.5mJ | Exp Date: 9/1/2018 | Result:(um) 0.090 Fail | Best Focus: | Nikon Recipe: 0IBM_CDV3.C21R5
Center Focus: 0um | SEM Name: S55V | Max Delta (um): 0.024 | 18V L3 (@ BD/BF): | SEM Recipe: 0_032302H_175_COMA
Focus Step: 0.05um | Meas Date: 9/10/2018 | Max 0.090 | 18V L1 (@ BD/BF): | Reticle: HCD #0323-02H
Exposed By: Nikon | Meas By: Sisters | Min -0.057 | 18V L5 (@ BD/BF): | Comment: None
ID#: 3

Reticle Error Removed

11				12				13				14				15			
L1 V	L5 V	L1 H	L5 H	L1 V	L5 V	L1 H	L5 H	L1 V	L5 V	L1 H	L5 H	L1 V	L5 V	L1 H	L5 H	L1 V	L5 V	L1 H	L5 H
174	174	172	172	205	185	186	202	225	198	199	223	215	189	193	213	192	162	179	180
0.000		-0.002		0.052		-0.044		0.063		-0.057		0.065		-0.051		0.085		-0.004	
L1 135	L5 135	L1 45	L5 45	L1 135	L5 135	L1 45	L5 45	L1 135	L5 135	L1 45	L5 45	L1 135	L5 135	L1 45	L5 45	L1 135	L5 135	L1 45	L5 45
174	184	181	172	210	194	204	190	221	202	217	212	196	192	212	217	176	178	189	166
-0.028		0.026		0.040		0.036		0.044		0.011		0.012		-0.013		-0.005		0.064	

16				17				18				19				20			
L1 V	L5 V	L1 H	L5 H	L1 V	L5 V	L1 H	L5 H	L1 V	L5 V	L1 H	L5 H	L1 V	L5 V	L1 H	L5 H	L1 V	L5 V	L1 H	L5 H
171	166	164	165	204	183	185	187	213	186	188	191	209	180	190	189	182	157	172	170
0.013		-0.002		0.053		-0.006		0.068		-0.006		0.075		0.002		0.073		0.008	
L1 135	L5 135	L1 45	L5 45	L1 135	L5 135	L1 45	L5 45	L1 135	L5 135	L1 45	L5 45	L1 135	L5 135	L1 45	L5 45	L1 135	L5 135	L1 45	L5 45
167	168	171	163	200	185	206	180	200	191	211	186	194	188	198	186	165	167	170	162
-0.005		0.023		0.040		0.067		0.022		0.063		0.017		0.032		-0.006		0.026	

21				22				23				24				25			
L1 V	L5 V	L1 H	L5 H	L1 V	L5 V	L1 H	L5 H	L1 V	L5 V	L1 H	L5 H	L1 V	L5 V	L1 H	L5 H	L1 V	L5 V	L1 H	L5 H
167	164	167	166	187	173	188	175	202	178	199	183	194	169	190	174	175	146	164	162
0.009		0.002		0.041		0.036		0.065		0.042		0.069		0.044		0.090		0.007	
L1 135	L5 135	L1 45	L5 45	L1 135	L5 135	L1 45	L5 45	L1 135	L5 135	L1 45	L5 45	L1 135	L5 135	L1 45	L5 45	L1 135	L5 135	L1 45	L5 45
168	168	165	171	181	177	199	177	192	192	209	181	185	182	194	170	164	154	164	155
-0.001		-0.019		0.013		0.059		-0.001		0.073		0.008		0.067		0.030		0.027	

Summary Results

	90	0	135	45
11	0.000	-0.002	-0.028	0.026
12	0.052	-0.044	0.040	0.036
13	0.063	-0.057	0.044	0.011
14	0.065	-0.051	0.012	-0.013
15	0.085	-0.004	-0.005	0.064
16	0.013	-0.002	-0.005	0.023
17	0.053	-0.006	0.040	0.067
18	0.068	-0.006	0.022	0.063
19	0.075	0.002	0.017	0.032
20	0.073	0.008	-0.006	0.026
21	0.009	0.002	-0.001	-0.019
22	0.041	0.036	0.013	0.059
23	0.065	0.042	-0.001	0.073
24	0.069	0.044	0.008	0.067
25	0.090	0.007	0.030	0.027

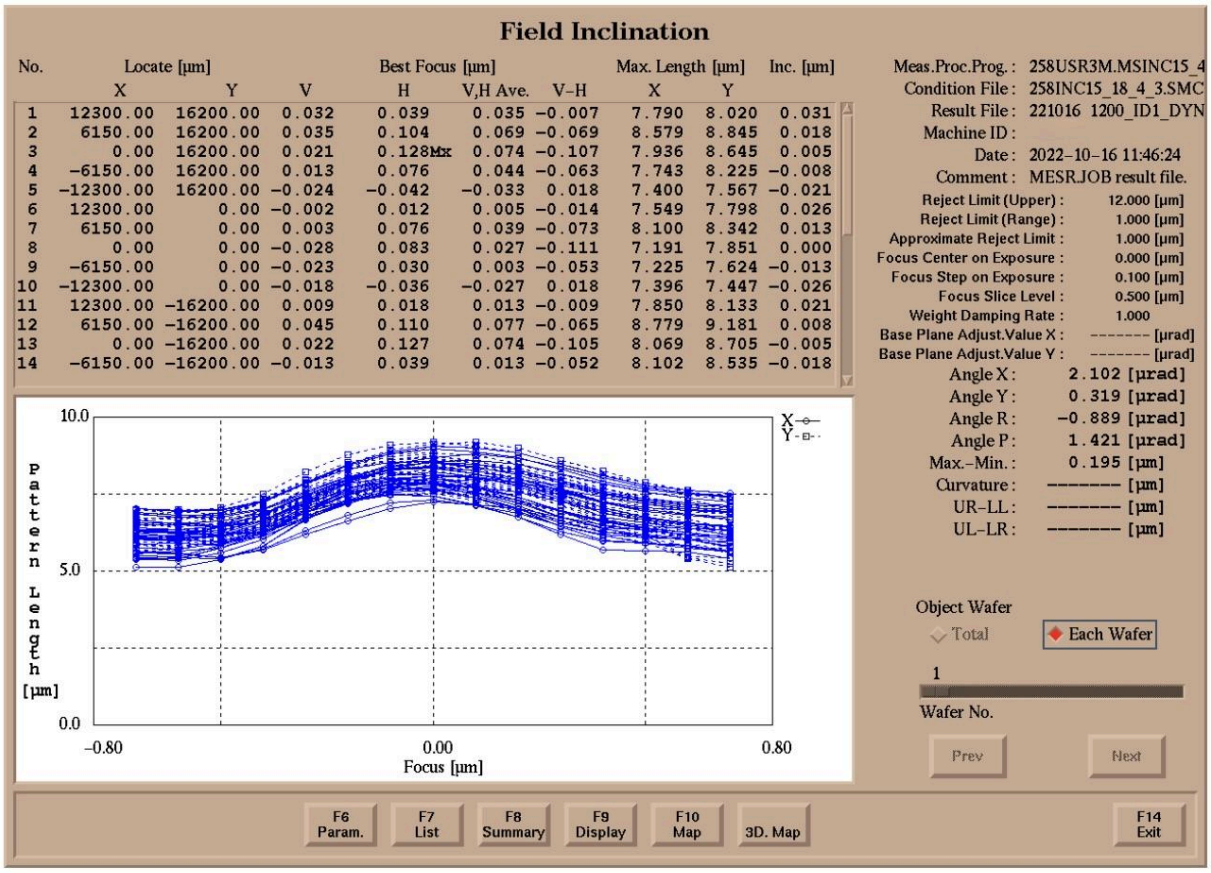
4. Total Focus Deviation (2024):

Conv NA/σ = 0.68/0.75

(0.25µm L&S / 15Point V/H)

SPEC: Max-Min≤0.20µm

Result: Max – Min = 0.195µm



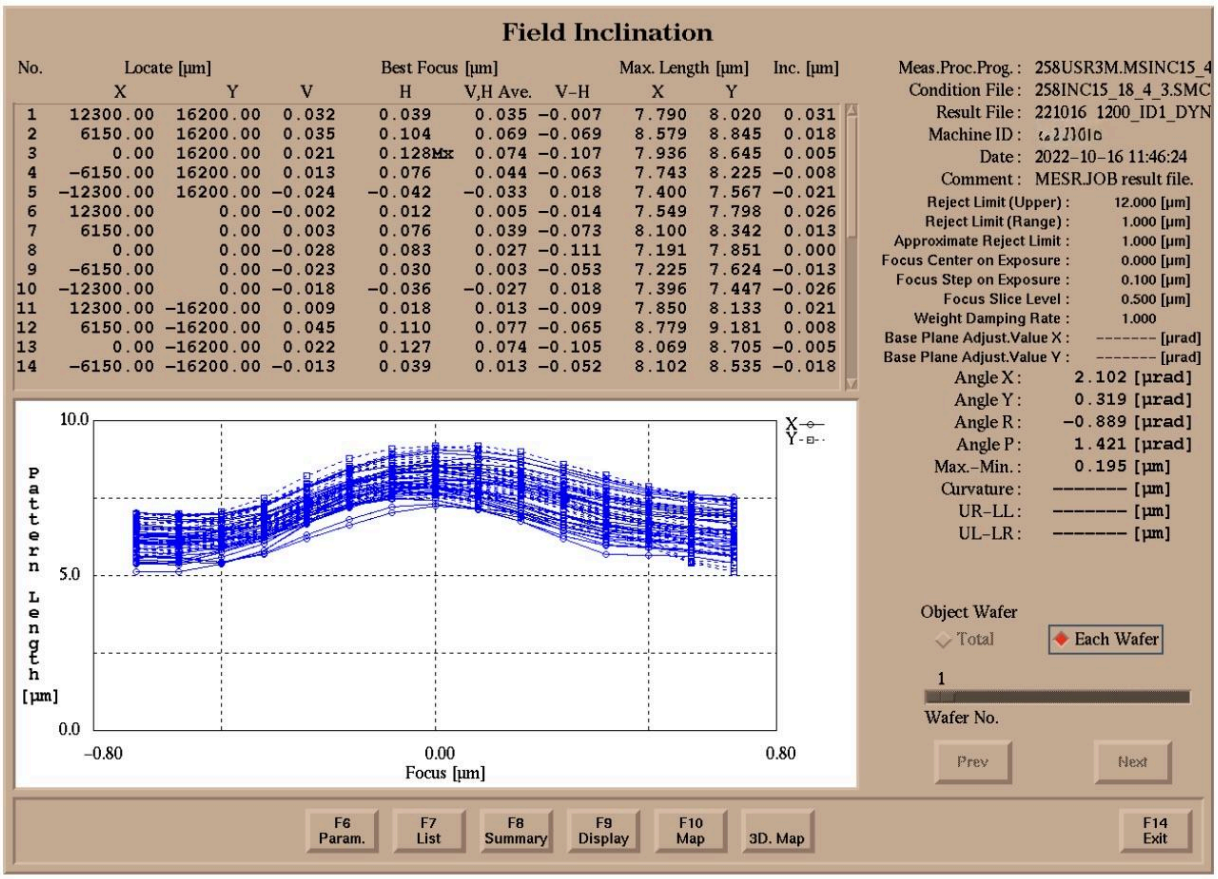
5. Lens Astigmatism (2024):

Conv NA/σ = 0.68/0.75

(0.25µm L&S / 15Point V/H)

SPEC: |V-H| ≤0.20µm

Result: |V-H| = 0.111µm



Field Inclination

No.	Locate [µm] X	Locate [µm] Y	Best Focus [µm] V	Best Focus [µm] H	Best Focus [µm] V,H Ave.	Best Focus [µm] V−H	Max. Length [µm] X	Max. Length [µm] Y	Inc. [µm]
1	12300.00	16200.00	0.032	0.039	0.035	−0.007	7.790	8.020	0.031
2	6150.00	16200.00	0.035	0.104	0.069	−0.069	8.579	8.845	0.018
3	0.00	16200.00	0.021	0.128Mx	0.074	−0.107	7.936	8.645	0.005
4	−6150.00	16200.00	0.013	0.076	0.044	−0.063	7.743	8.225	−0.008
5	−12300.00	16200.00	−0.024	−0.042	−0.033	0.018	7.400	7.567	−0.021
6	12300.00	0.00	−0.002	0.012	0.005	−0.014	7.549	7.798	0.026
7	6150.00	0.00	0.003	0.076	0.039	−0.073	8.100	8.342	0.013
8	0.00	0.00	−0.028	0.083	0.027	−0.111	7.191	7.851	0.000
9	−6150.00	0.00	−0.023	0.030	0.003	−0.053	7.225	7.624	−0.013
10	−12300.00	0.00	−0.018	−0.036	−0.027	0.018	7.396	7.447	−0.026
11	12300.00	−16200.00	0.009	0.018	0.013	−0.009	7.850	8.133	0.021
12	6150.00	−16200.00	0.045	0.110	0.077	−0.065	8.779	9.181	0.008
13	0.00	−16200.00	0.022	0.127	0.074	−0.105	8.069	8.705	−0.005
14	−6150.00	−16200.00	−0.013	0.039	0.013	−0.052	8.102	8.535	−0.018

Meas.Proc.Prog. : 258USR3M.MSINC15_4
Condition File : 258INC15_18_4_3.SMC
Result File : 221016 1200_ID1_DYN
Machine ID : [illegible]
Date : 2022-10-16 11:46:24
Comment : MESR.JOB result file.
Reject Limit (Upper) : 12.000 [µm]
Reject Limit (Range) : 1.000 [µm]
Approximate Reject Limit : 1.000 [µm]
Focus Center on Exposure : 0.000 [µm]
Focus Step on Exposure : 0.100 [µm]
Focus Slice Level : 0.500 [µm]
Weight Damping Rate : 1.000
Base Plane Adjust.Value X : ------- [µrad]
Base Plane Adjust.Value Y : ------- [µrad]
Angle X : 2.102 [µrad]
Angle Y : 0.319 [µrad]
Angle R : −0.889 [µrad]
Angle P : 1.421 [µrad]
Max.−Min. : 0.195 [µm]
Curvature : ------- [µm]
UR−LL : ------- [µm]
UL−LR : ------- [µm]

Object Wafer
Total
Each Wafer
1
Wafer No.
Prev
Next

F6 Param. | F7 List | F8 Summary | F9 Display | F10 Map | 3D. Map | F14 Exit

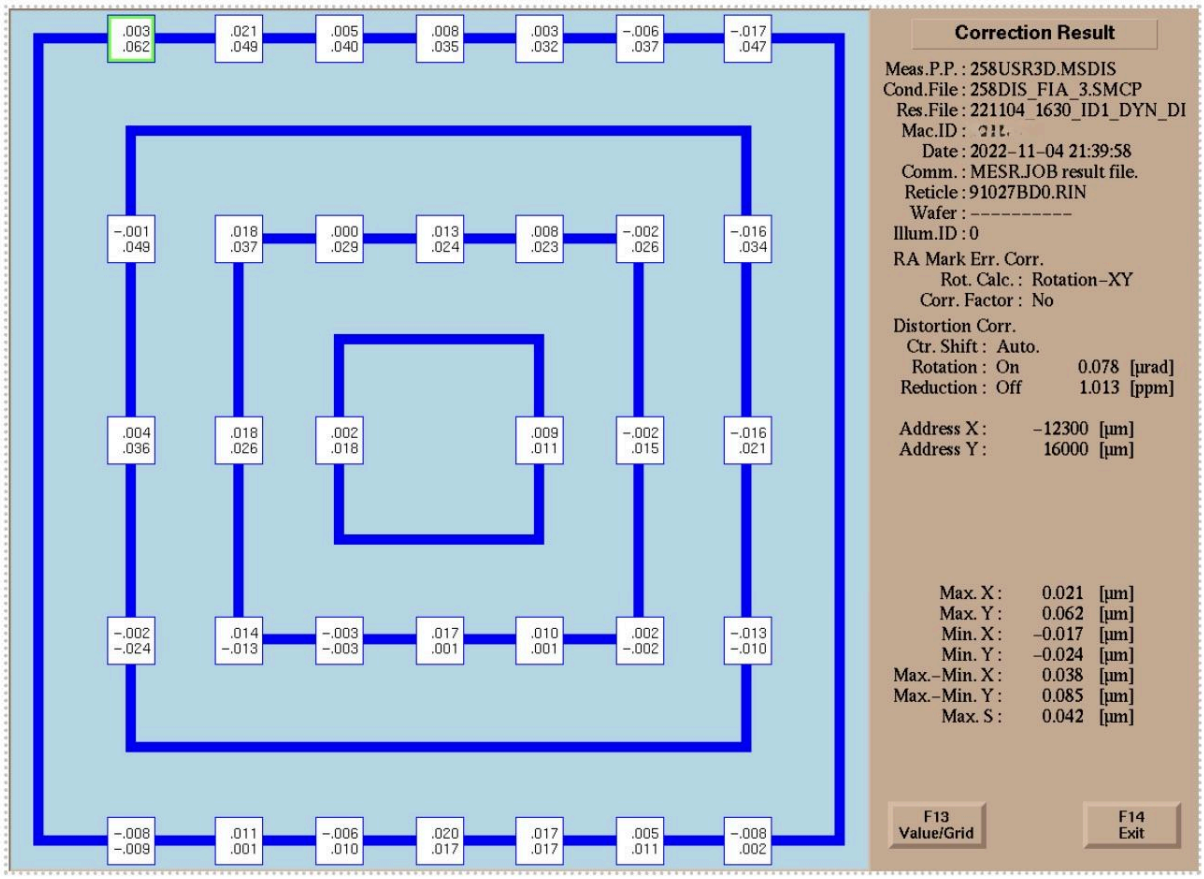
6. Lens Dynamic Distortion (2022):

Conv NA/σ = 0.68/0.75

SPEC: X,Y = Within ±25nm

Result: X = -17nm~21nm

Y = -24nm~62nm



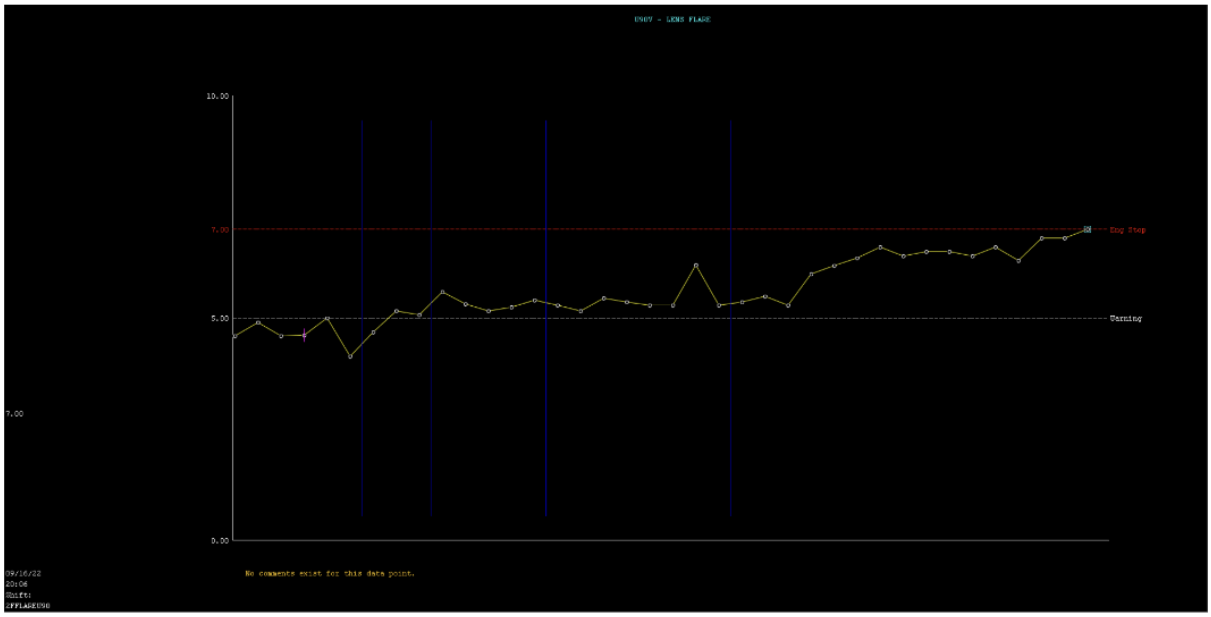
7. Lens Flare/IU Flare (2022):

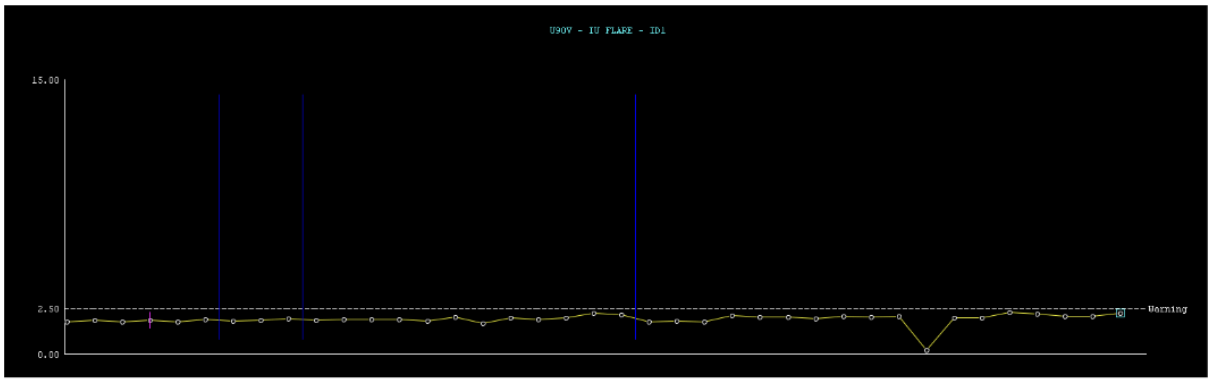
Conv NA/σ = 0.68/0.75

SPEC: TBD based on Product Requirements

Results: Lens Flare = 7.0% IU Flare = 2.26%

From Nikon Lens Flare Test with RPF installed

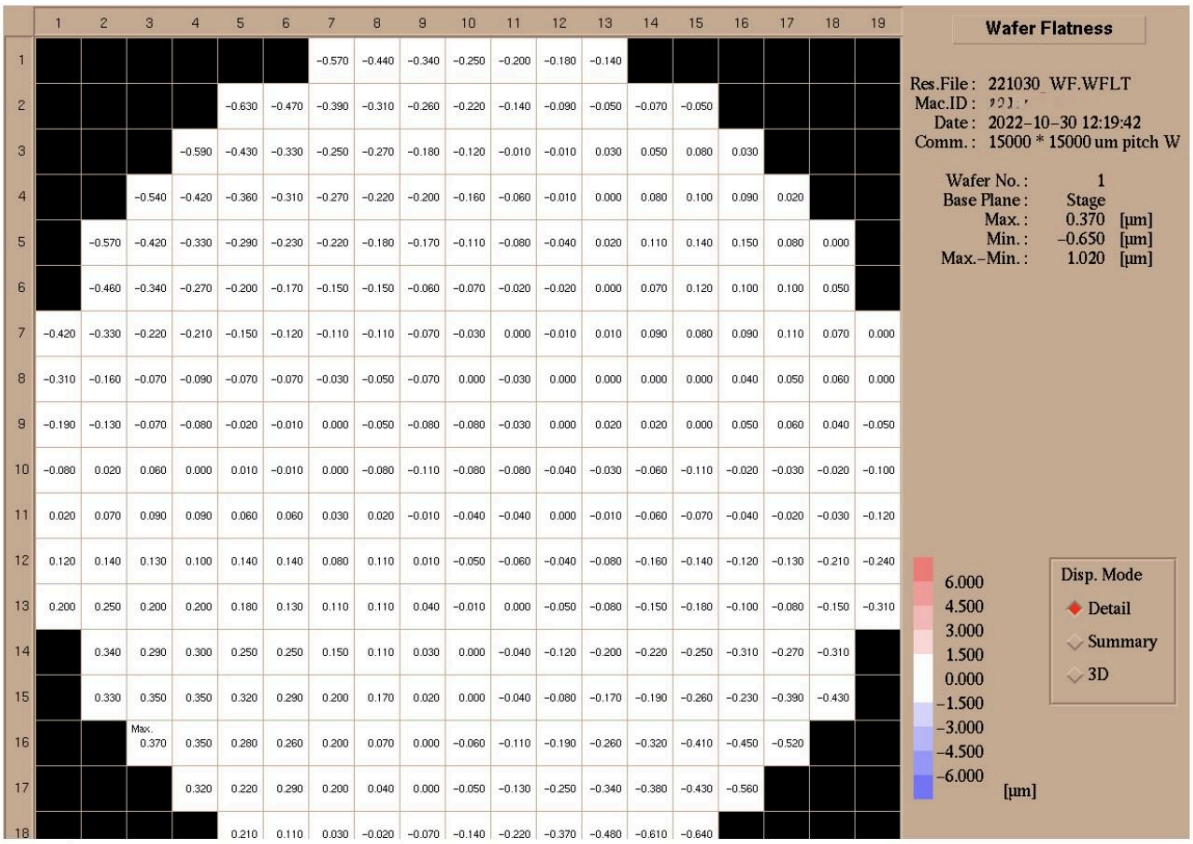




8. Wafer Flatness Accuracy (2022):

SPEC: 1) Flat Within ≥ Max-Min 3.0μm

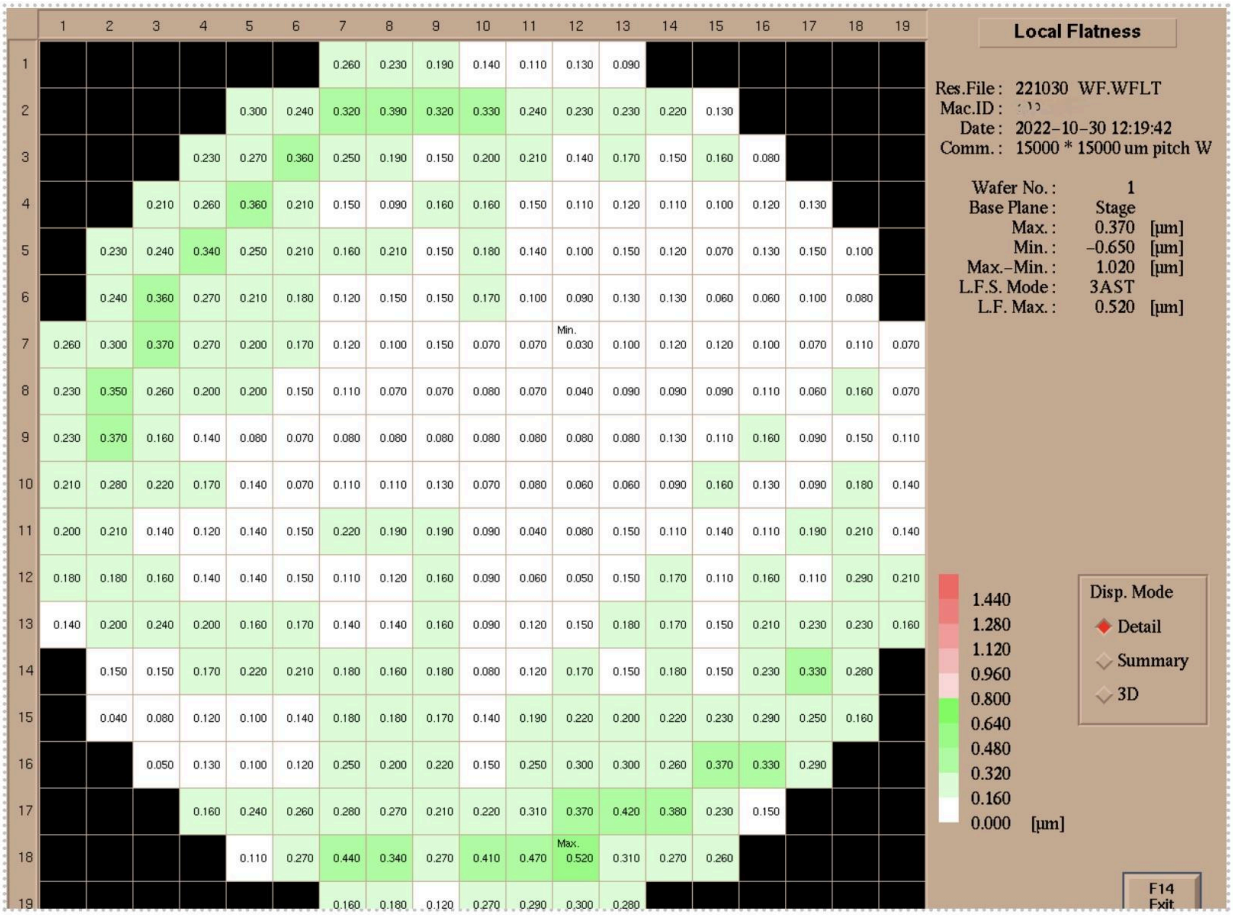
Result: Max-Min = 1.02μm



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1							-0.570	-0.440	-0.340	-0.250	-0.200	-0.180	-0.140						
2					-0.630	-0.470	-0.390	-0.310	-0.260	-0.220	-0.140	-0.090	-0.050	-0.070	-0.050				
3				-0.590	-0.430	-0.330	-0.250	-0.270	-0.180	-0.120	-0.010	-0.010	0.030	0.050	0.080	0.030			
4			-0.540	-0.420	-0.360	-0.310	-0.270	-0.220	-0.200	-0.160	-0.060	-0.010	0.000	0.080	0.100	0.090	0.020		
5		-0.570	-0.420	-0.330	-0.290	-0.230	-0.220	-0.180	-0.170	-0.110	-0.080	-0.040	0.020	0.110	0.140	0.150	0.080	0.000	
6		-0.460	-0.340	-0.270	-0.200	-0.170	-0.150	-0.150	-0.060	-0.070	-0.020	-0.020	0.000	0.070	0.120	0.100	0.100	0.050	
7	-0.420	-0.330	-0.220	-0.210	-0.150	-0.120	-0.110	-0.110	-0.070	-0.030	0.000	-0.010	0.010	0.090	0.080	0.090	0.110	0.070	0.000
8	-0.310	-0.160	-0.070	-0.090	-0.070	-0.070	-0.030	-0.050	-0.070	0.000	-0.030	0.000	0.000	0.000	0.000	0.040	0.050	0.060	0.000
9	-0.190	-0.130	-0.070	-0.080	-0.020	-0.010	0.000	-0.050	-0.080	-0.080	-0.030	0.000	0.020	0.020	0.000	0.050	0.060	0.040	-0.050
10	-0.080	0.020	0.060	0.000	0.010	-0.010	0.000	-0.080	-0.110	-0.080	-0.080	-0.040	-0.030	-0.060	-0.110	-0.020	-0.030	-0.020	-0.100
11	0.020	0.070	0.090	0.090	0.060	0.060	0.030	0.020	-0.010	-0.040	-0.040	0.000	-0.010	-0.060	-0.070	-0.040	-0.020	-0.030	-0.120
12	0.120	0.140	0.130	0.100	0.140	0.140	0.080	0.110	0.010	-0.050	-0.060	-0.040	-0.080	-0.160	-0.140	-0.120	-0.130	-0.210	-0.240
13	0.200	0.250	0.200	0.200	0.180	0.130	0.110	0.110	0.040	-0.010	0.000	-0.050	-0.080	-0.150	-0.180	-0.100	-0.080	-0.150	-0.310
14		0.340	0.290	0.300	0.250	0.250	0.150	0.110	0.030	0.000	-0.040	-0.120	-0.200	-0.220	-0.250	-0.310	-0.270	-0.310	
15		0.330	0.350	0.350	0.320	0.290	0.200	0.170	0.020	0.000	-0.040	-0.080	-0.170	-0.190	-0.260	-0.230	-0.390	-0.430	
16			Max. 0.370	0.350	0.280	0.260	0.200	0.070	0.000	-0.060	-0.110	-0.190	-0.260	-0.320	-0.410	-0.450	-0.520		
17				0.320	0.220	0.290	0.200	0.040	0.000	-0.050	-0.130	-0.250	-0.340	-0.380	-0.430	-0.560			
18					0.210	0.110	0.030	-0.020	-0.070	-0.140	-0.220	-0.370	-0.480	-0.610	-0.640				

SPEC: 2) L.F.S Within ≥ Max-Min 0.8μm

Result: Max-Min = 0.520μm



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1							0.260	0.230	0.190	0.140	0.110	0.130	0.090						
2					0.300	0.240	0.320	0.390	0.320	0.330	0.240	0.230	0.230	0.220	0.130				
3				0.230	0.270	0.360	0.250	0.190	0.150	0.200	0.210	0.140	0.170	0.150	0.160	0.080			
4			0.210	0.260	0.360	0.210	0.150	0.090	0.160	0.160	0.150	0.110	0.120	0.110	0.100	0.120	0.130		
5		0.230	0.240	0.340	0.250	0.210	0.160	0.210	0.150	0.180	0.140	0.100	0.150	0.120	0.070	0.130	0.150	0.100	
6		0.240	0.360	0.270	0.210	0.180	0.120	0.150	0.150	0.170	0.100	0.090	0.130	0.130	0.060	0.060	0.100	0.080	
7	0.260	0.300	0.370	0.270	0.200	0.170	0.120	0.100	0.150	0.070	0.070	0.030	0.100	0.120	0.120	0.100	0.070	0.110	0.070
8	0.230	0.350	0.260	0.200	0.200	0.150	0.110	0.070	0.070	0.080	0.070	0.040	0.090	0.090	0.090	0.110	0.060	0.160	0.070
9	0.230	0.370	0.160	0.140	0.080	0.070	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.130	0.110	0.160	0.090	0.150	0.110
10	0.210	0.280	0.220	0.170	0.140	0.070	0.110	0.110	0.130	0.070	0.080	0.060	0.060	0.090	0.160	0.130	0.090	0.180	0.140
11	0.200	0.210	0.140	0.120	0.140	0.150	0.220	0.190	0.190	0.090	0.040	0.080	0.150	0.110	0.140	0.110	0.190	0.210	0.140
12	0.180	0.180	0.160	0.140	0.140	0.150	0.110	0.120	0.160	0.090	0.060	0.050	0.150	0.170	0.110	0.160	0.110	0.290	0.210
13	0.140	0.200	0.240	0.200	0.160	0.170	0.140	0.140	0.160	0.090	0.120	0.150	0.180	0.170	0.150	0.210	0.230	0.230	0.160
14		0.150	0.150	0.170	0.220	0.210	0.180	0.160	0.180	0.080	0.120	0.170	0.150	0.180	0.150	0.230	0.330	0.280	
15		0.040	0.080	0.120	0.100	0.140	0.180	0.180	0.170	0.140	0.190	0.220	0.200	0.220	0.230	0.290	0.250	0.160	
16			0.050	0.130	0.100	0.120	0.250	0.200	0.220	0.150	0.250	0.300	0.300	0.260	0.370	0.330	0.290		
17				0.160	0.240	0.260	0.280	0.270	0.210	0.220	0.310	0.370	0.420	0.380	0.230	0.150			
18					0.110	0.270	0.440	0.340	0.270	0.410	0.470	0.520	0.310	0.270	0.260				
19							0.160	0.180	0.120	0.270	0.290	0.300	0.280						

9/10 Exposure Power / Uniformity (2022):

Conv NA/σ = 0.68/0.75

SPEC: Power = Within ≥ 700mW/cm2

Spec: Uniformity Within ±2%

Result: 1) Illumination Power = 837.89mW/cm2

2) Uniformity = 5.09%

Note: 15.5% RPF installed

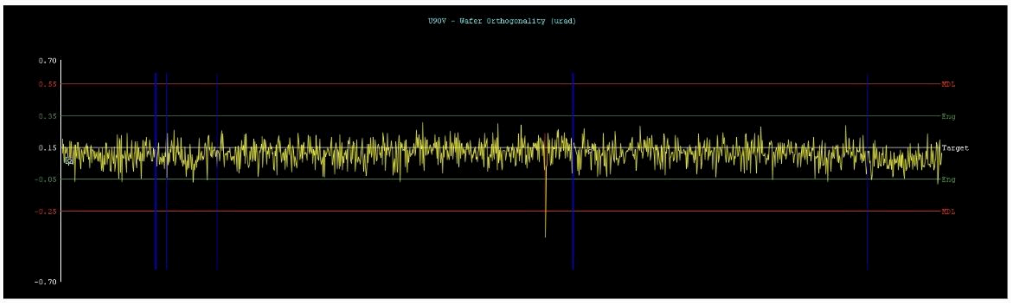
	1	2	3	4	5	6	7	8	9	10	11
1	958	941	921	902	897	897	898	898	904	920	956
2	958	936	914	896	893	888	888	890	899	918	968
3	958	937	910	892	889	887	882	884	896	911	984
4	956	936	909	893	892	891	887	885	894	909	991
5	955	936	910	894	898	897	887	883	892	909	993
6	958	938	911	897	898	897	890	885	894	910	994
7	957	941	912	899	899	901	893	886	895	912	997
8	960	943	914	903	898	900	889	886	896	914	1000
9	965	946	921	908	900	903	893	892	902	918	987
10	970	954	928	916	903	902	900	902	911	926	973
11	975	960	940	926	914	909	908	911	919	932	971

11. Orthogonality:

SPEC: Within ±0.48uran

Result: 0.20urad

Data is from ASML Overlay Tool Checks 2019-2022



12. Stage Precision Accuracy (2018):

SPEC: Step X,Y 3σ ≤ 25nm

Backlash X,Y 3σ ≤ 25nm

Result:

1) Stepping Accuracy

SX1(3σ) : 14nm SY1(3σ) : 7nm

SX2(3σ) : 19nm SY2(3σ) : 10nm

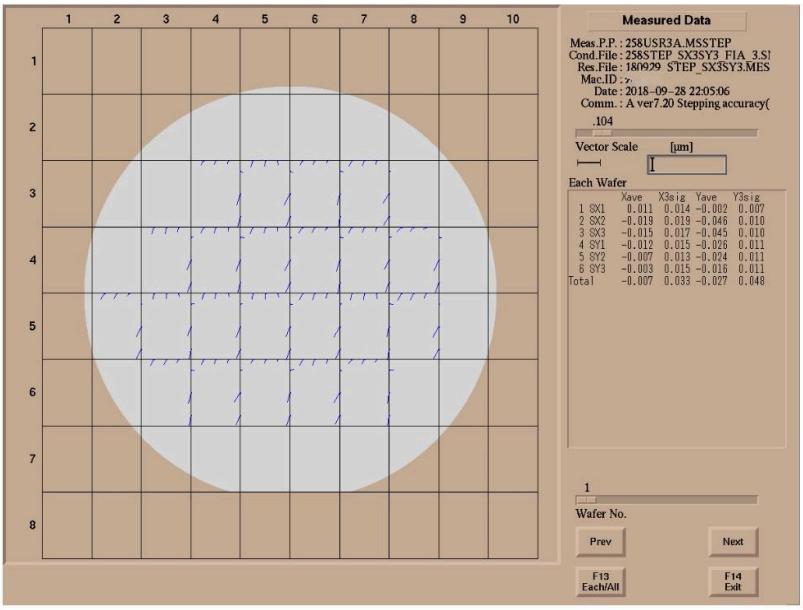
SX3(3σ) : 17nm SY3(3σ) : 10nm

2) Backlash Accuracy

SX1(3σ) : 15nm SY1(3σ) : 11nm

SX2(3σ) : 13nm SY2(3σ) : 11nm

SX3(3σ) : 15nm SY3(3σ) : 11nm



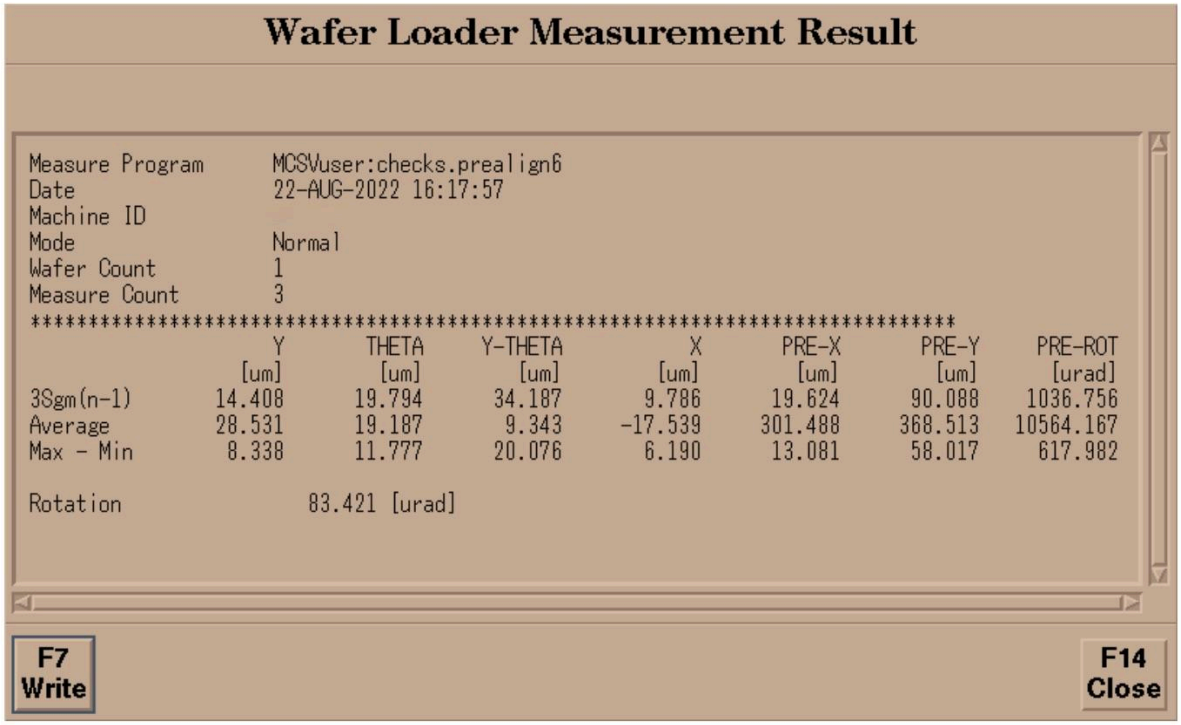
13. Wafer Pre-Alignment Repeatability (2022):

SPEC: 3σ ≤ 15μm

Result: X(3σ) = 9.786μm

Y(3σ) = 14.408μm

T(3σ) = 19.794μm



Wafer Loader Measurement Result

Measure Program MCSVuser:checks.prealign6
Date 22-AUG-2022 16:17:57
Machine ID
Mode Normal
Wafer Count 1
Measure Count 3

	Y [um]	THETA [um]	Y-THETA [um]	X [um]	PRE-X [um]	PRE-Y [um]	PRE-ROT [urad]
3Sgm(n-1)	14.408	19.794	34.187	9.786	19.624	90.088	1036.756
Average	28.531	19.187	9.343	-17.539	301.488	368.513	10564.167
Max - Min	8.338	11.777	20.076	6.190	13.081	58.017	617.982

Rotation 83.421 [urad]

F7 Write

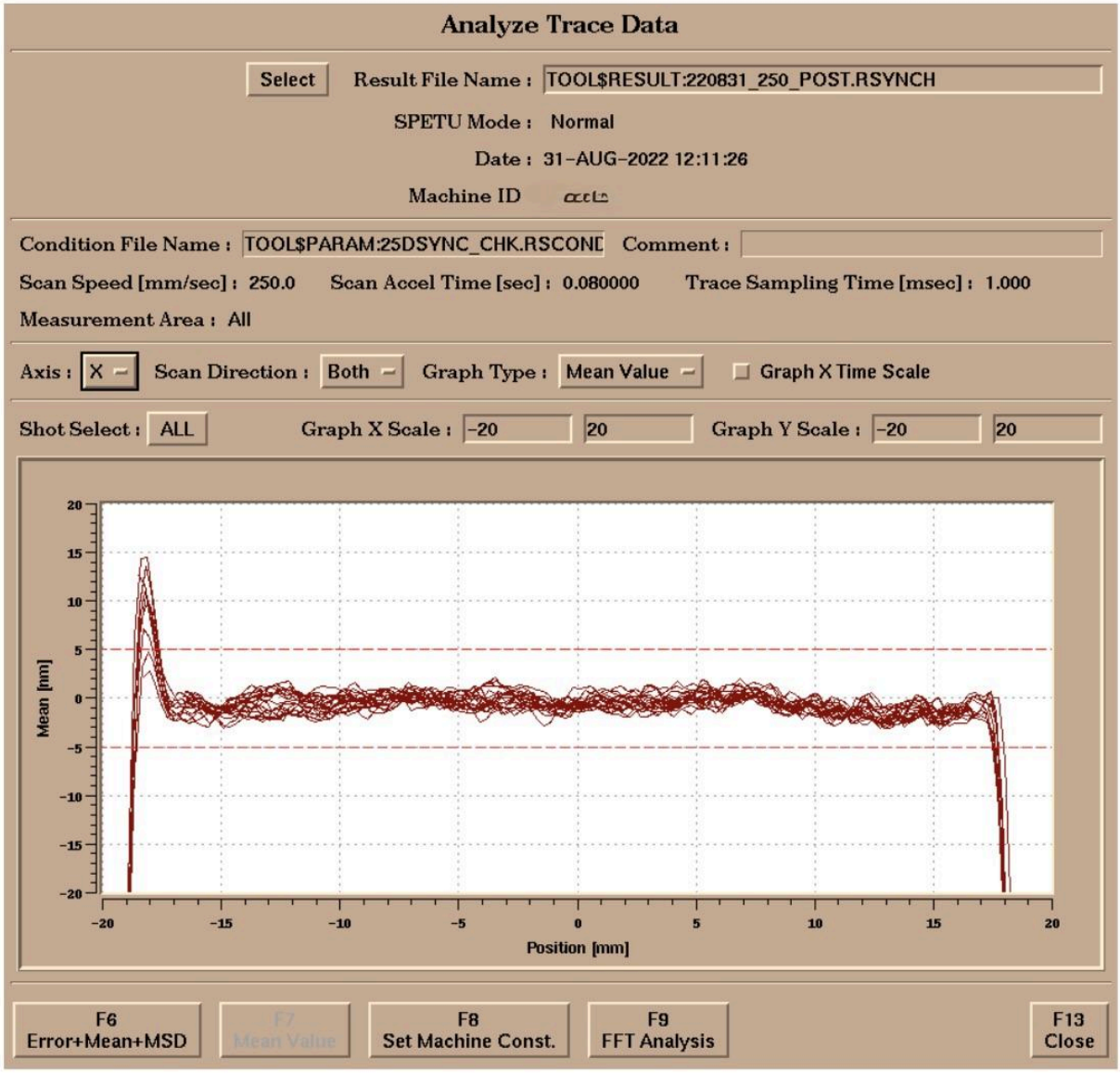
F14 Close

14. Synchronization Accuracy (2022):

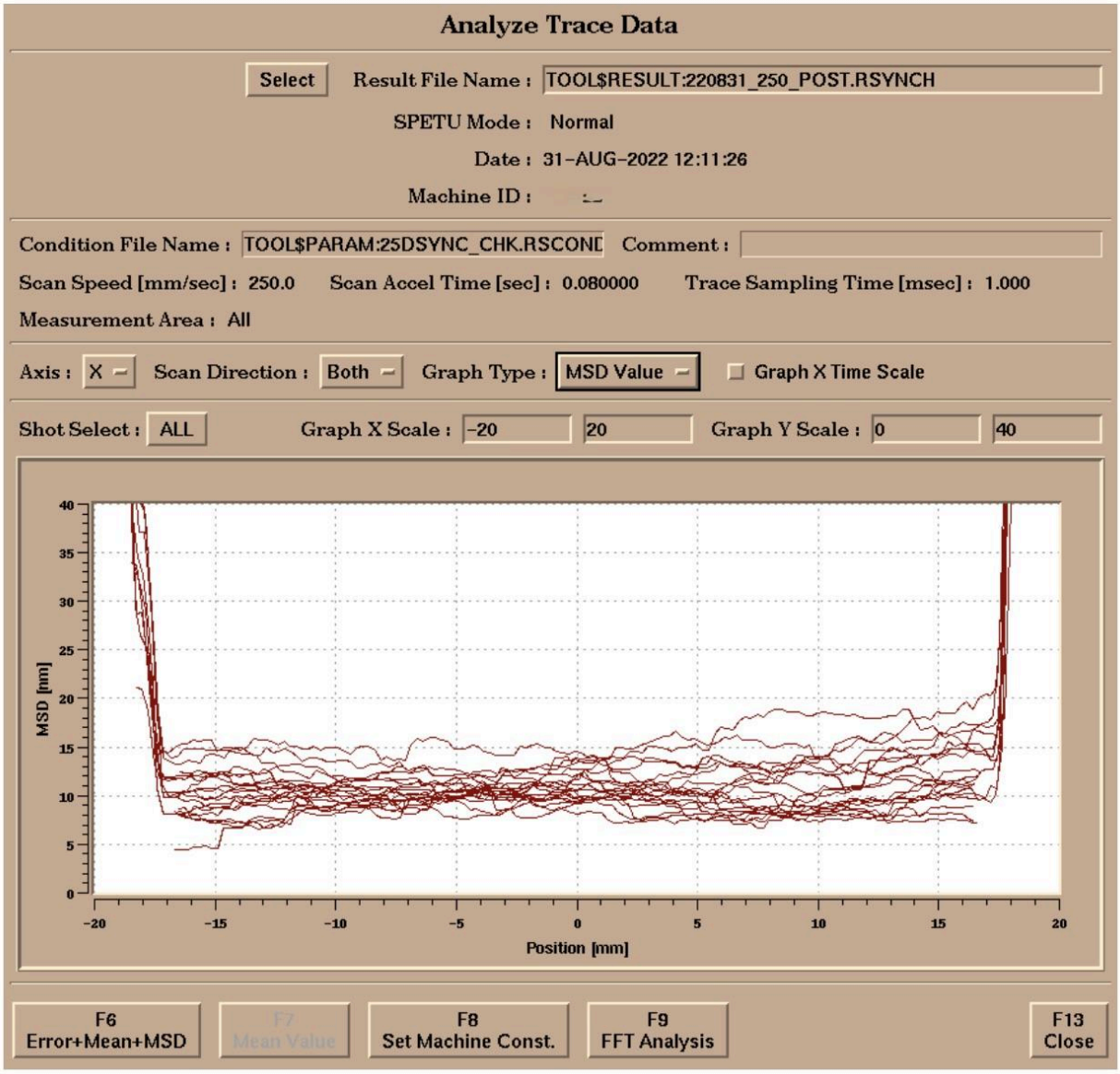
SPEC : 1) Mean ≤ 10nm (Within = -5nm ~+5nm)

2) MSD ≤ 25nm

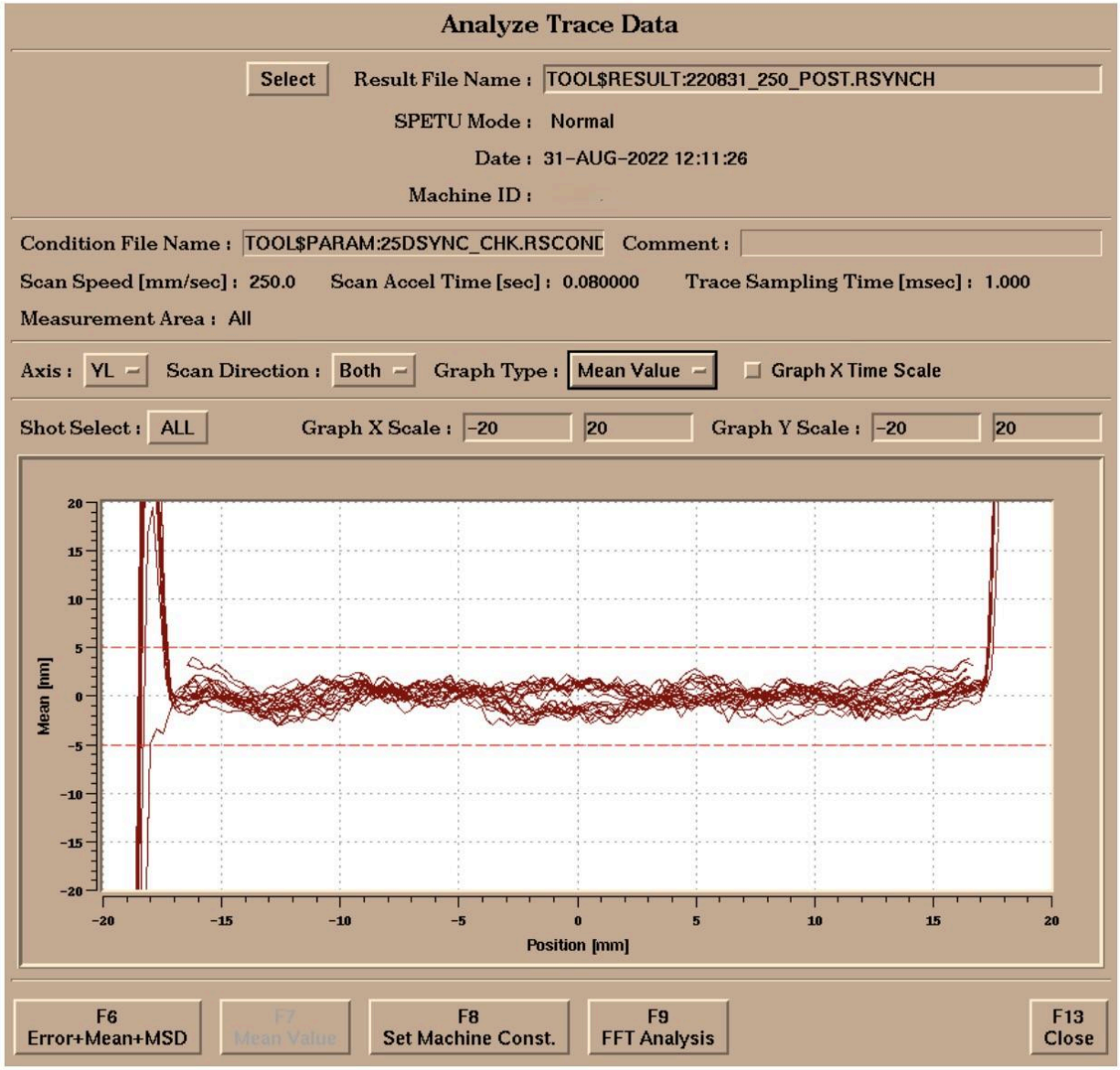
X MEAN Value : 6nm (-3nm ~ 3nm)



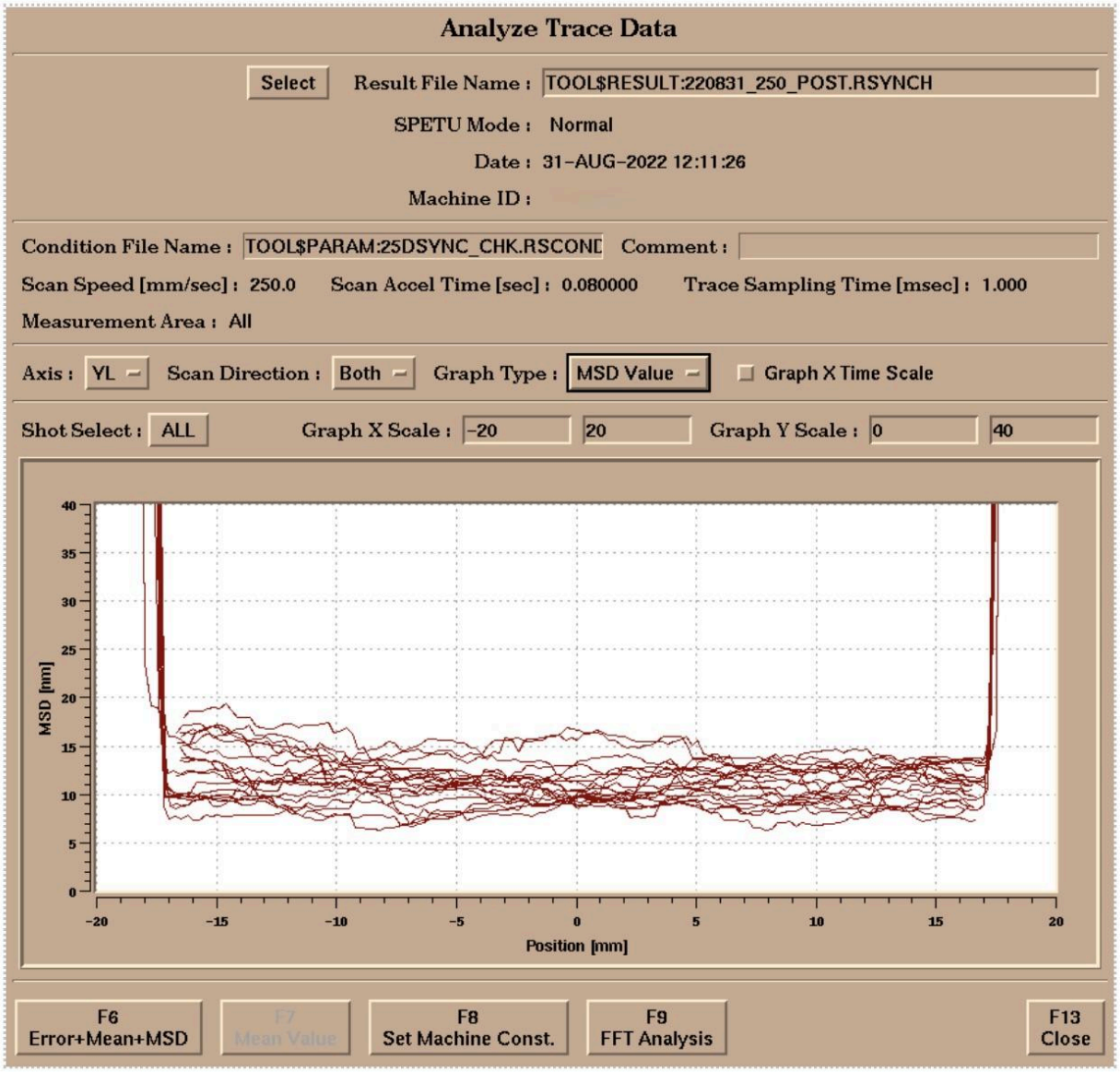
X MSD Max : 20nm



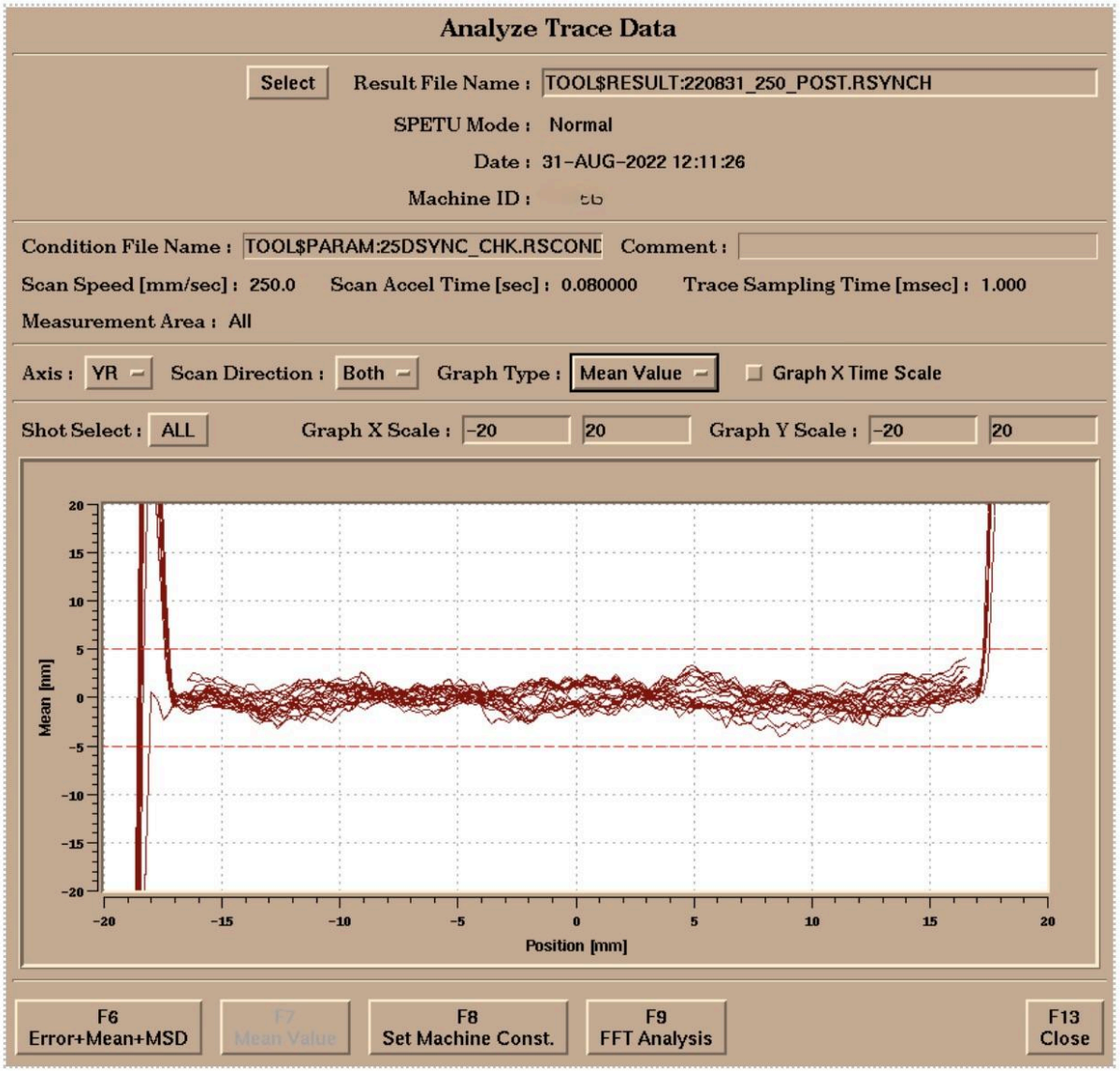
YL MEAN Value : 8nm (-4nm ~ 4nm)



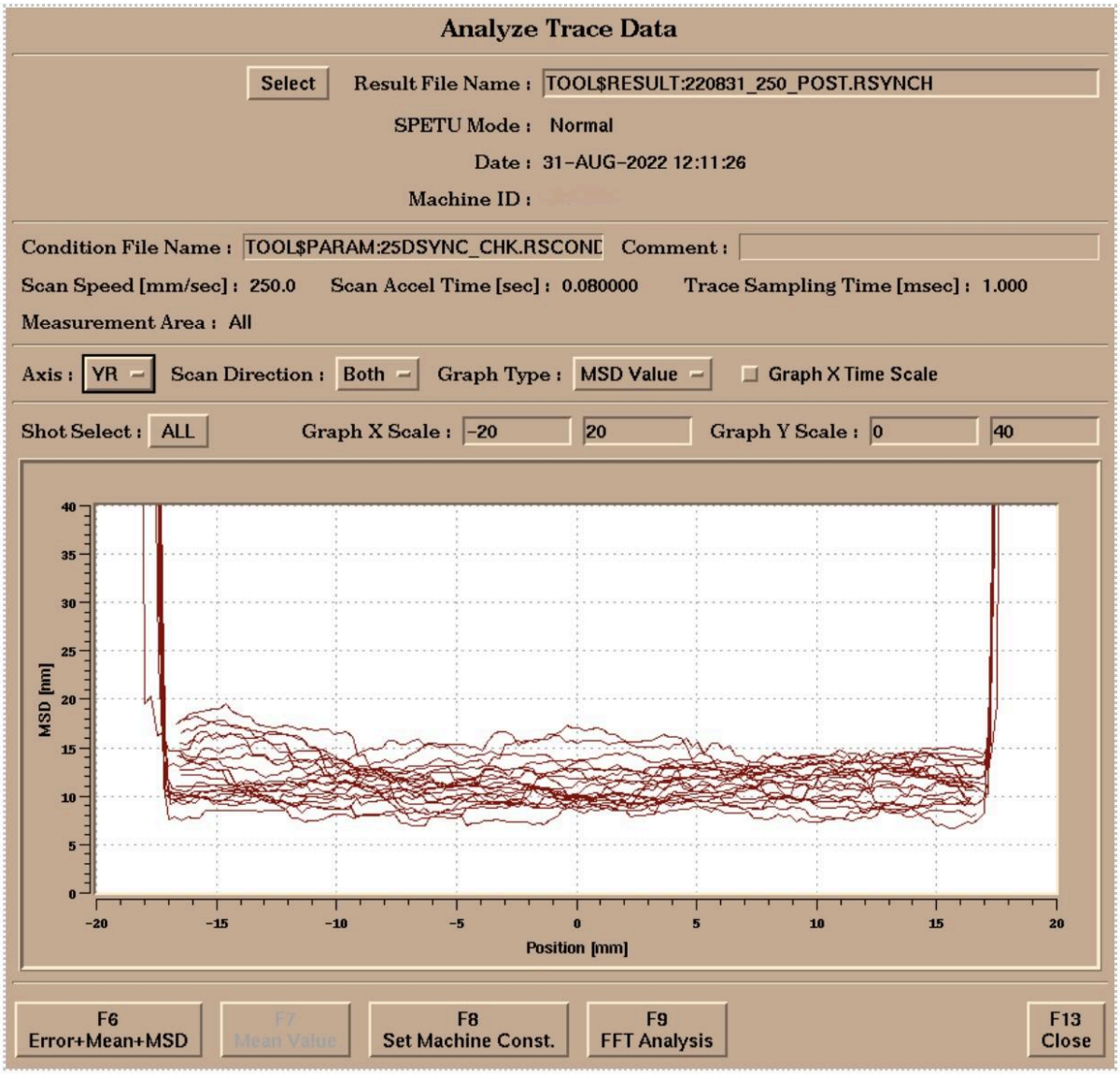
YL MSD Max : 20nm



YR Mean Value : 8nm (-4nm ~ 4nm)



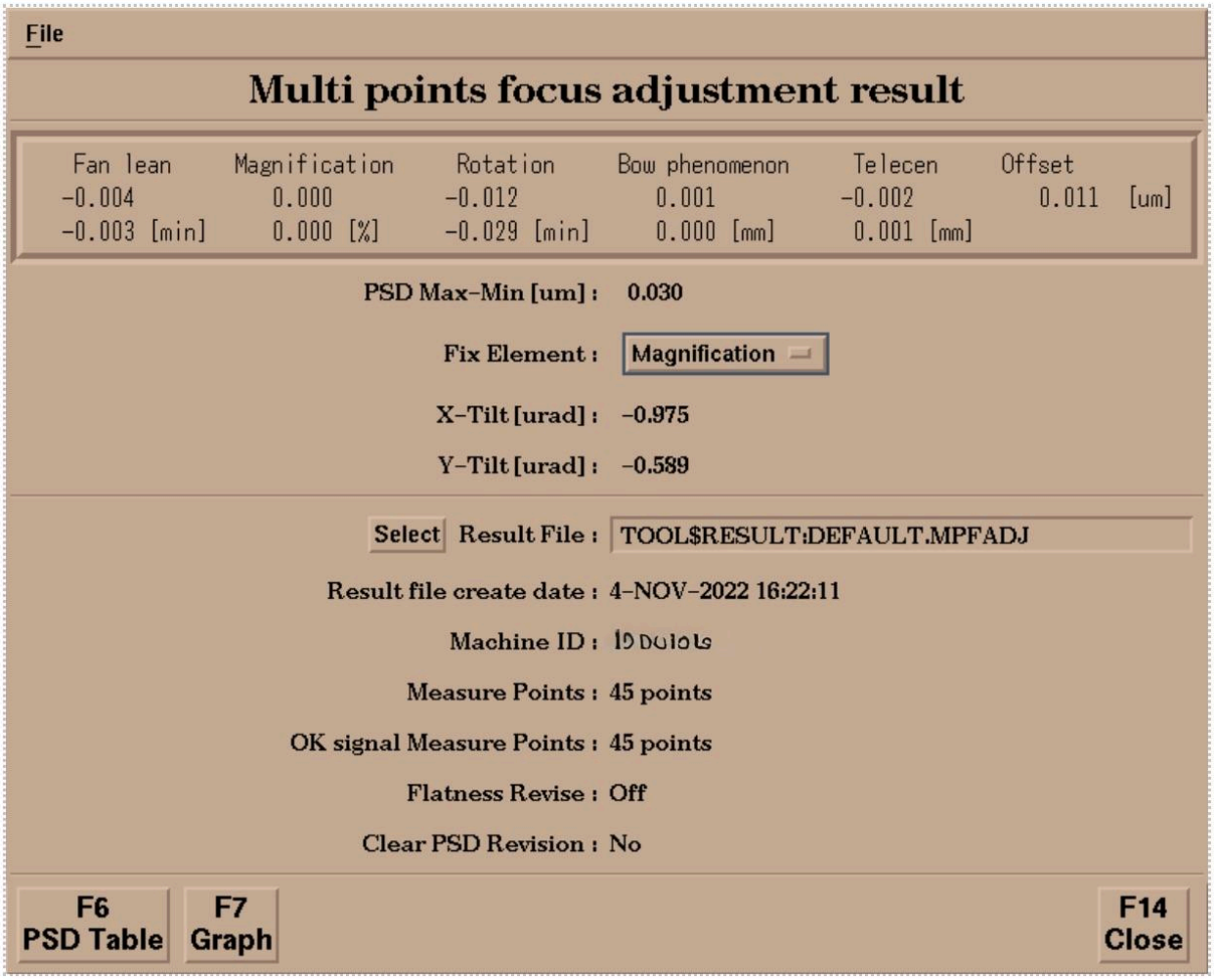
YR MSD Max : 20nm



15. AF Adjustment Result (2022):

SPEC: PSD Max – Min ≤ 0.2µm

Result: PSD Max – Min = 0.030µm



16. Integrator Accuracy (2022):

Conv NA/σ = 0.68/0.75

SPEC: Ave ≤ 1.3%

Result: Max = 0.24%

Target Value Accuracy

	Target [mJ/cm2]	Result [mJ/cm2]	residual (AVE) [%]	repeatability [%]
1	10.000	10.007	0.065	0.075
2	20.000	20.019	0.095	0.050
3	50.000	50.120	0.240	0.020
4	100.000	100.200	0.200	0.000
5	------	------	-------	-------
6	------	------	-------	-------
7	------	------	-------	-------

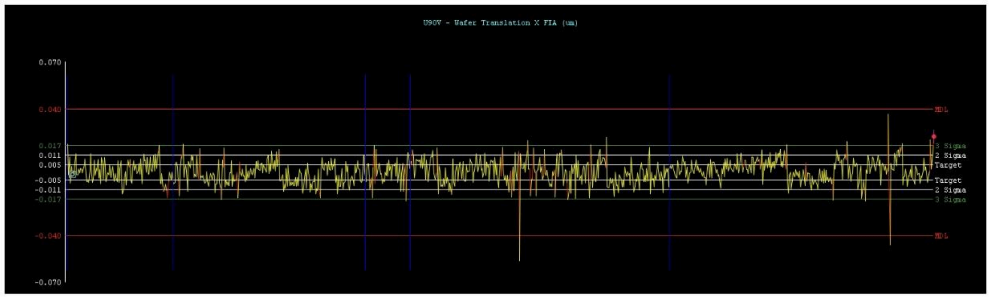
17-1 FIA (2024):

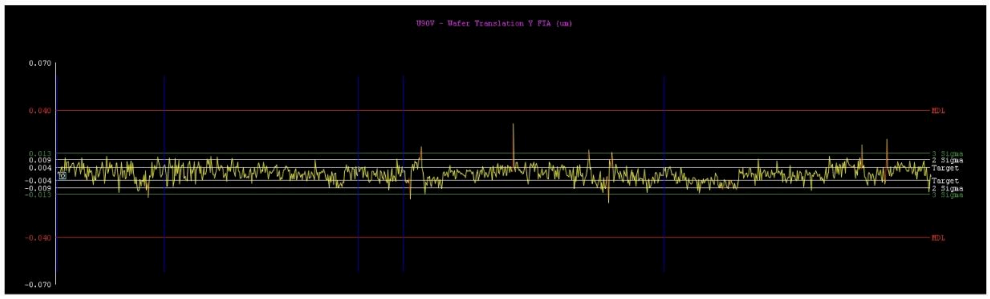
SPEC: FIA-EGA = |M| + 3σ ≤ 35nm

Result: FIA-EGA X = 20nm

FIA-EGA Y = 20nm

Data is from Overlay FIA Check 2018-2022





17-2 LSA (2024):

SPEC: LSA-EGA = |M| + 3σ ≤ 40nm

Result: LSA-EGA X = 20nm

LSA-EGA Y = 20nm

Data is from Overlay LSA Check 2018-2022