

CMM Specialists

Calibration Certificate and Summary

Certificate Number: 5347-1

Customer Information

Customer:	Impact CNC	Calibration Date:	6-Aug-19
City, State:	Columbia City, IN	Start Date:	5-Aug-19
Machine Location:	Inspection	Performed By:	J. Maksymowski

Manufactures Data

Machine Make:	Zeiss	Machine Condition:	Good
Machine Model:	CenterMax	Software/Version:	Calypso/5.4.x
Machine Serial Number:	120816	Calibration Sphere #:	L4967-A
Squarness Uncertainty:	1.0 Arc Sec.	Sphere Radius (mm):	14.9952
U1 Uncertainty:	1.3 + L / 350	Gage Block Tracability:	CMMS-2
U3 Uncertainty:	1.6 + L / 300	Gage Block Uncertainty	.06+.5L/1000mm

Cmm Specialists has certified the above Coordinate Measuring Machine in accordance with the standards set forth in VDI/VDE 2617 standard. The equipment used in the calibration has been certified by a ISO 17025 accredited company and is tracable to the National Institute of Standards and Technology (NIST). The calibration performed includes all tests and measurments necessary to verify the CMMs adherence to the required quality and measuring accuracies as documented in the enclosed protocol. CMM Specialists Maintains a quality system that meets or exceeds the requirement set forth in the ISO/IEC 17025 document.

Summary of Results

Meets Specification Before Calibration?	No Data, Due to required repair to Controller		
Meets Specification After Calibration?	Yes	No	If No, This Machine was calibrated to the temperature shown below.
With Temperature Correction?	X Axis		
Temperature:	21.0	Co-Efficient of Scale:	0.0
Max. Means Dev. Before: (mm)	No Data	Max. Means Dev. After: (mm)	0.00087
	Y axis Outside		
Temperature:	21.0	Co-Efficient of Scale:	0.0
Max. Means Dev. Before: (mm)	No Data	Max. Means Dev. After: (mm)	-0.00095
	Y axis Inside		
Temperature:	21.0	Co-Efficient of Scale:	0.0
Max. Means Dev. Before: (mm)	No Data	Max. Means Dev. After: (mm)	0.00056
	Z Axis		
Temperature:	21.0	Co-Efficient of Scale:	0.0
Max. Means Dev. Before: (mm)	No Data	Max. Means Dev. After: (mm)	0.00126
	Spatials		
Temperature:	21.0	Temperature:	21.0
Spatial 1 Deviation: (mm)	-0.00172	Spatial 2 deviation: (mm)	-0.00165
Temperature:	21.0	Temperature:	21.0
Spatial 3 Deviation: (mm)	0.00002	Spatial 4 Deviation: (mm)	-0.00197
	Squarness		
XY Squarness Before:(arc sec)	No Data	XY Squarness After:(arc sec)	0.01
XZ Squarness Before:(arc sec)	No Data	XZ Squarness After:(arc sec)	0.00
YZ Squarness Before:(arc sec)	No Data	YZ Squarness After:(arc sec)	0.03

Items in red indicate out of Zeiss Specifications

By Signing below, the customer certifies that CMM Specialists has performed the calibration and that the customer and the technician have reviewed the results together. It is the policy of CMM Specialists not to make any determination if the attached resultswill meet the requirements of the customer.

Customer Signature: _____ **Date:** _____

Technicians Signature: Jeff Maksymowski 8/6/2019



Certificate # L1137-1 Calibration

These results pertain only to the item calibrated and are the opinions and interpretations of A & A Calibration. Measurement of uncertainty is not taken into account in making statements of compliance.

Long Gage Block
Certificate of Calibration

AARN 190051

MLGBR1 6/1/18

Company Name: CMM Specialists - Flint, MI
 Make: Mitutoyo Style: Rectangular
 Serial #: CMMS-2 Grade: GGG 2
 Material: Steel Number of Blocks: 5
 Units of Measure: mm Error Expressed in: micrometer
 Calibration Date: Feb 25, 2019 Next Calibration Date: Feb 25, 2021

I.D. Number	Size	Before	After	Measurement of Uncertainty
032814	100	<u>-.12</u>	<u>-.12</u>	<u>.23</u>
032044	200	<u>.29</u>	<u>.29</u>	<u>.46</u>
030284	300	<u>-.18</u>	<u>-.18</u>	<u>.66</u>
030104	400	<u>.55</u>	<u>.55</u>	<u>.86</u>
020049	500	<u>.11</u>	<u>.11</u>	<u>1.06</u>

In Tolerance as Received: Yes Condition as Received: Good
 In Tolerance as Returned: Yes Condition as Returned: Good

Comments: _____

A & A Calibration 12916 Farmington Rd Livonia MI certifies that the calibrations within this certificate are traceable through NIST to the International System of Units.

These were performed at 68.2°F & 21.2% humidity through A&A 1115 in accordance with procedure A&A135R10 & ISO 17025:2005.

Master#: 1122 Cal Date: 7-30-09 Cert#: 502148 Due: 7-30-19
 Master#: 1068 Cal Date: 6-18-18 Cert#: 18AA1068 Due: 6-18-19
 Master#: _____ Cal Date: _____ Cert#: _____ Due: _____

See reverse for tolerance chart.

R. M. Nk 2.27.19
 Q.C. Manager

[Signature]
 Calibration Technician

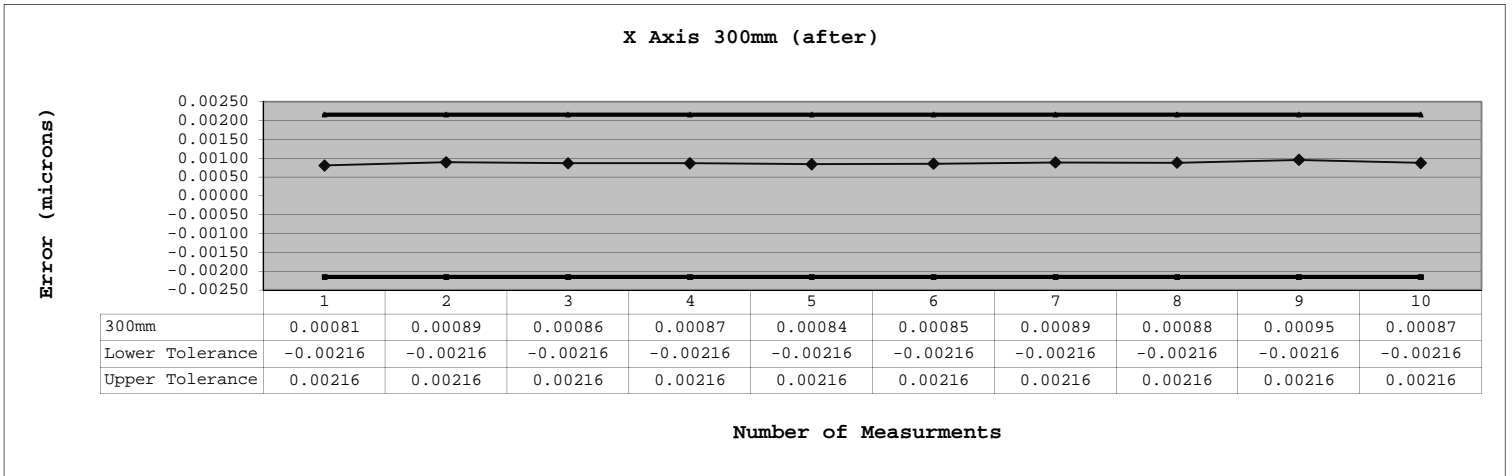
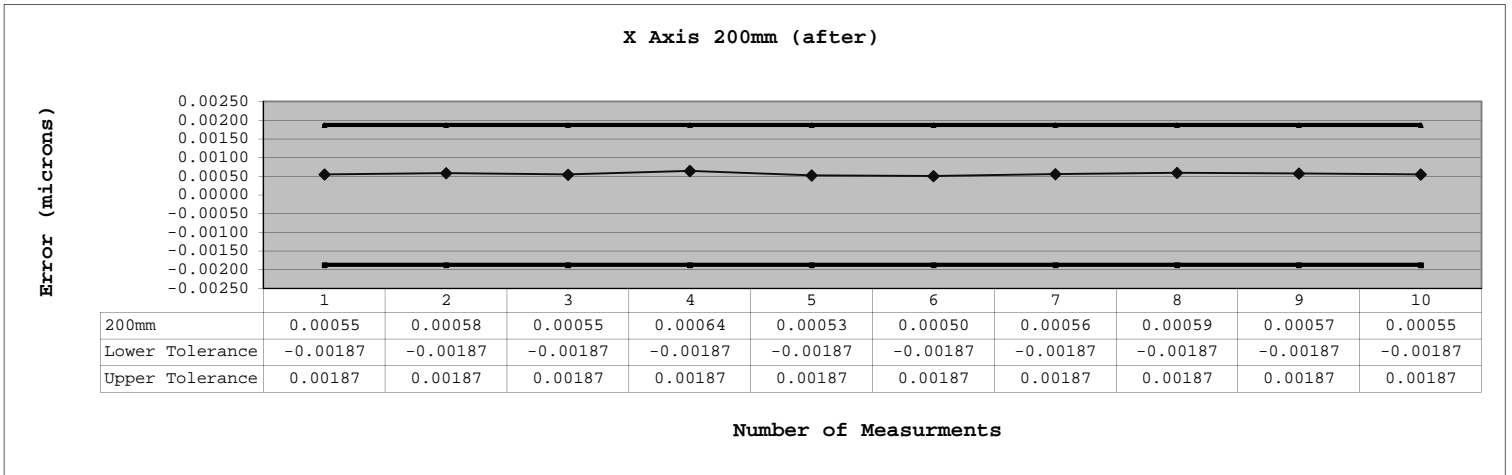
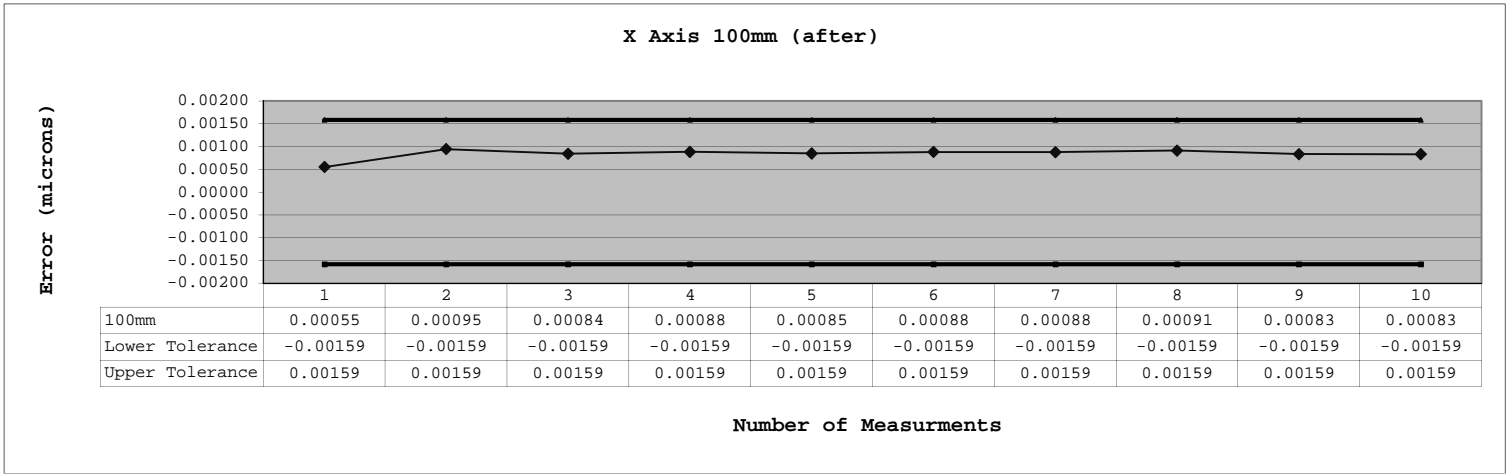
This certificate shall not be reproduced except in full without the written approval of A & A Calibration.

Page 1 of 1

A & A Calibration Inc.
 12916 Farmington Road
 Livonia MI 48150

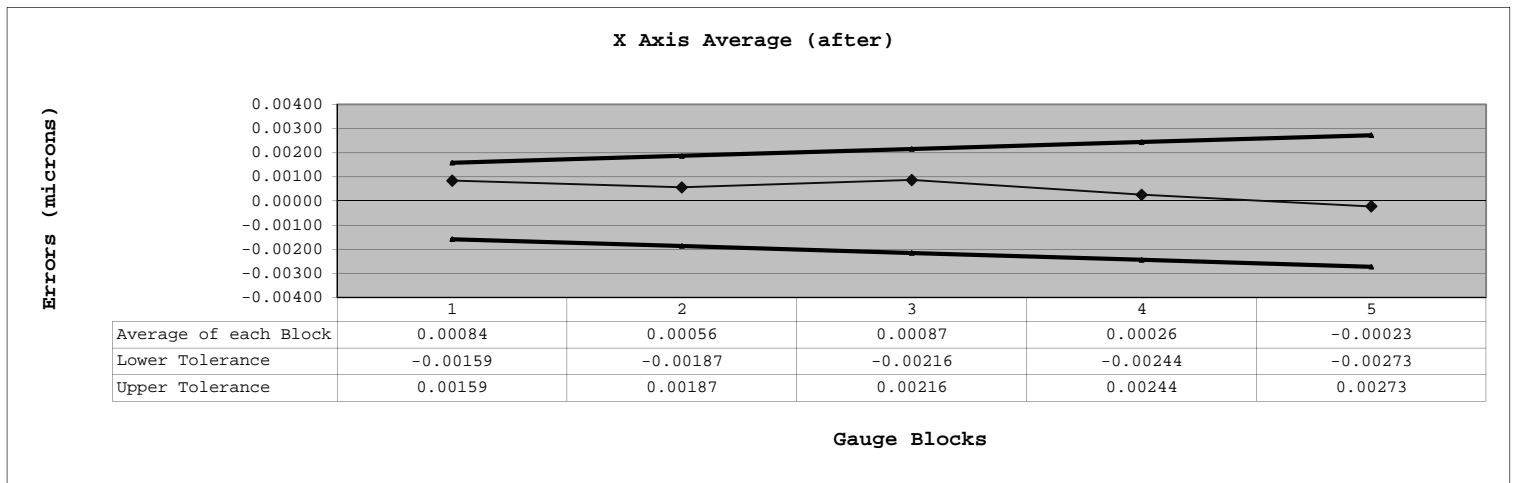
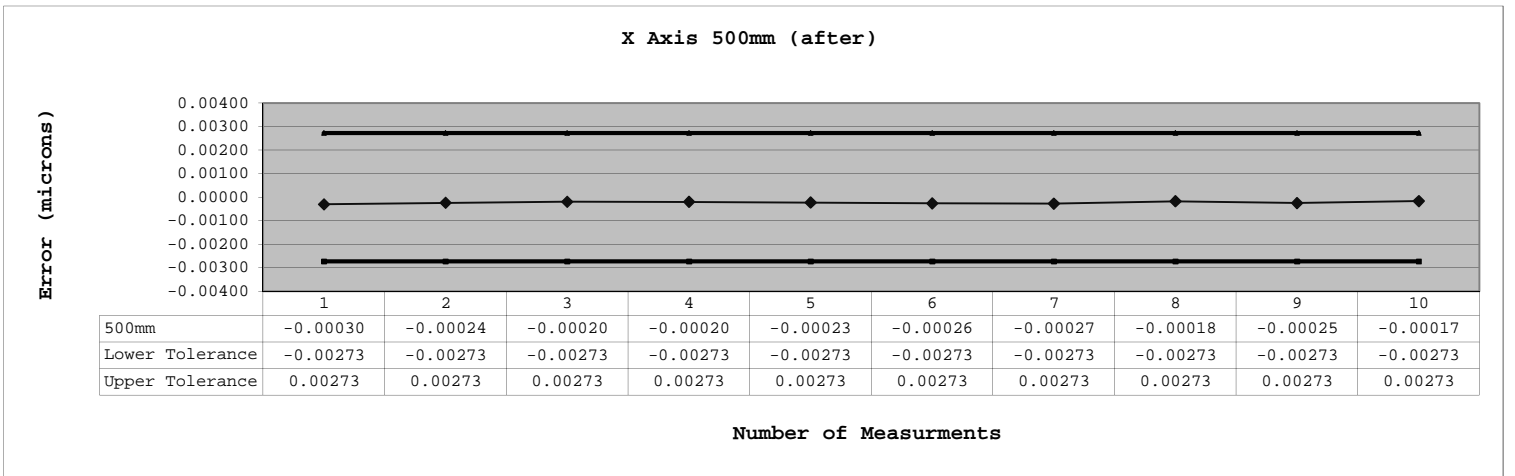
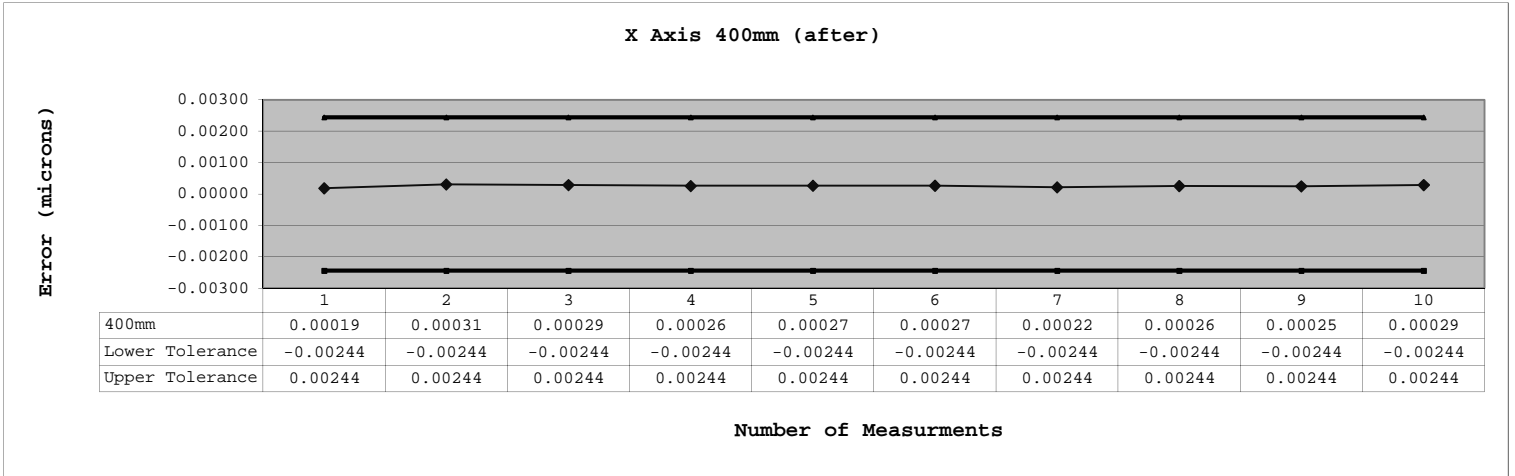
CMM Specialists

Graphed Errors and Averages



CMM Specialists

Graphed Errors and Averages



X Axis After

U1 Spec.=

1.3

+ L /

350

100mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
99.99988	100.00043	0.00055	-0.00159	0.00159	34.79%
99.99988	100.00083	0.00095	-0.00159	0.00159	59.61%
99.99988	100.00072	0.00084	-0.00159	0.00159	53.13%
99.99988	100.00077	0.00088	-0.00159	0.00159	55.81%
99.99988	100.00073	0.00085	-0.00159	0.00159	53.73%
99.99988	100.00076	0.00088	-0.00159	0.00159	55.53%
99.99988	100.00076	0.00088	-0.00159	0.00159	55.26%
99.99988	100.00079	0.00091	-0.00159	0.00159	57.62%
99.99988	100.00071	0.00083	-0.00159	0.00159	52.61%
99.99988	100.00071	0.00083	-0.00159	0.00159	52.42%
avg.	100.00072	0.00084	-0.00159	0.00159	53.05%

200mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
200.00029	200.00084	0.00055	-0.00187	0.00187	29.45%
200.00029	200.00087	0.00058	-0.00187	0.00187	31.17%
200.00029	200.00084	0.00055	-0.00187	0.00187	29.31%
200.00029	200.00093	0.00064	-0.00187	0.00187	34.33%
200.00029	200.00082	0.00053	-0.00187	0.00187	28.14%
200.00029	200.00079	0.00050	-0.00187	0.00187	26.93%
200.00029	200.00085	0.00056	-0.00187	0.00187	30.05%
200.00029	200.00088	0.00059	-0.00187	0.00187	31.63%
200.00029	200.00086	0.00057	-0.00187	0.00187	30.68%
200.00029	200.00084	0.00055	-0.00187	0.00187	29.57%
avg.	200.00085	0.00056	-0.00187	0.00187	30.13%

300mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
299.99982	300.00063	0.00081	-0.00216	0.00216	37.34%
299.99982	300.00071	0.00089	-0.00216	0.00216	41.22%
299.99982	300.00068	0.00086	-0.00216	0.00216	40.09%
299.99982	300.00069	0.00087	-0.00216	0.00216	40.20%
299.99982	300.00066	0.00084	-0.00216	0.00216	38.86%
299.99982	300.00067	0.00085	-0.00216	0.00216	39.39%
299.99982	300.00071	0.00089	-0.00216	0.00216	41.12%
299.99982	300.00070	0.00088	-0.00216	0.00216	40.64%
299.99982	300.00077	0.00095	-0.00216	0.00216	44.10%
299.99982	300.00069	0.00087	-0.00216	0.00216	40.50%
avg.	300.00069	0.00087	-0.00216	0.00216	40.35%

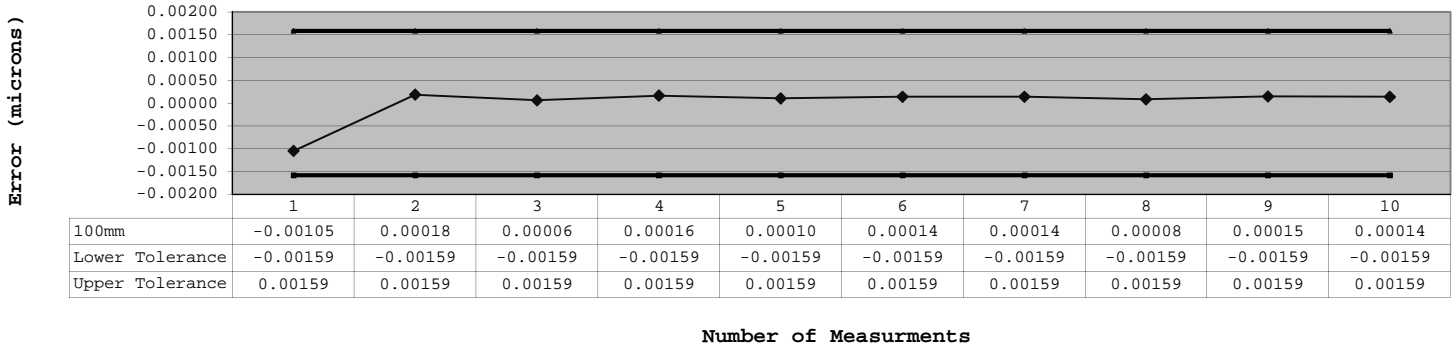
400mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
400.00055	400.00074	0.00019	-0.00244	0.00244	7.60%
400.00055	400.00086	0.00031	-0.00244	0.00244	12.73%
400.00055	400.00084	0.00029	-0.00244	0.00244	11.86%
400.00055	400.00081	0.00026	-0.00244	0.00244	10.71%
400.00055	400.00082	0.00027	-0.00244	0.00244	10.94%
400.00055	400.00082	0.00027	-0.00244	0.00244	10.94%
400.00055	400.00077	0.00022	-0.00244	0.00244	8.86%
400.00055	400.00081	0.00026	-0.00244	0.00244	10.46%
400.00055	400.00080	0.00025	-0.00244	0.00244	10.22%
400.00055	400.00084	0.00029	-0.00244	0.00244	11.81%
avg.	400.00081	0.00026	-0.00244	0.00244	10.61%

500mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
500.00011	499.99981	-0.00030	-0.00273	0.00273	-11.02%
500.00011	499.99987	-0.00024	-0.00273	0.00273	-8.70%
500.00011	499.99991	-0.00020	-0.00273	0.00273	-7.15%
500.00011	499.99991	-0.00020	-0.00273	0.00273	-7.29%
500.00011	499.99988	-0.00023	-0.00273	0.00273	-8.47%
500.00011	499.99985	-0.00026	-0.00273	0.00273	-9.61%
500.00011	499.99984	-0.00027	-0.00273	0.00273	-9.73%
500.00011	499.99993	-0.00018	-0.00273	0.00273	-6.51%
500.00011	499.99986	-0.00025	-0.00273	0.00273	-9.16%
500.00011	499.99994	-0.00017	-0.00273	0.00273	-6.07%
avg.	499.99988	-0.00023	-0.00273	0.00273	-8.37%

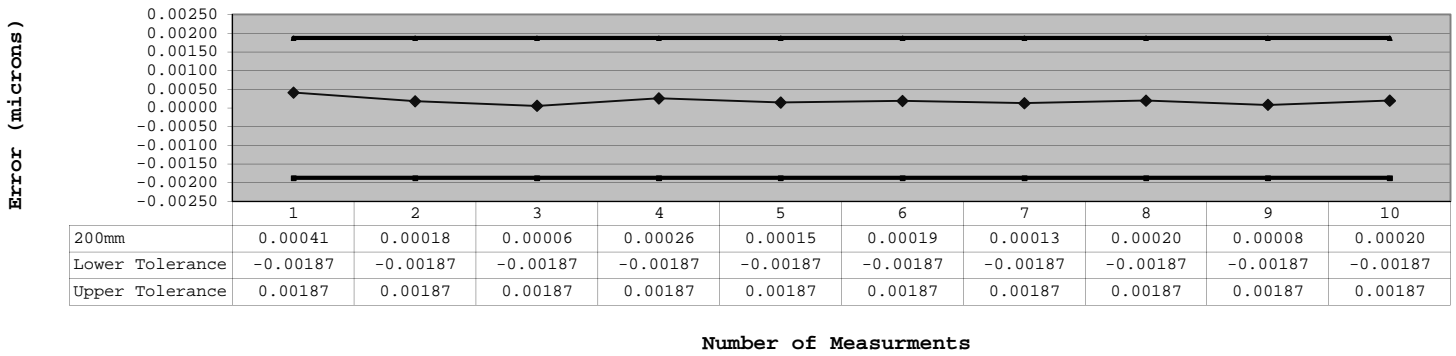
CMM Specialists

Graphed Errors and Averages

Y Axis Outside (after) 100mm

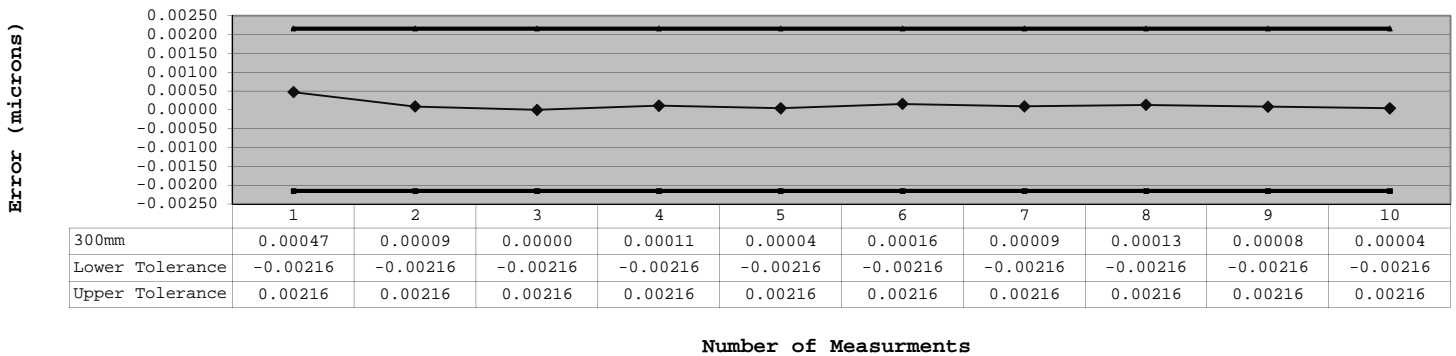


Y Axis Outside (after) 200mm



300

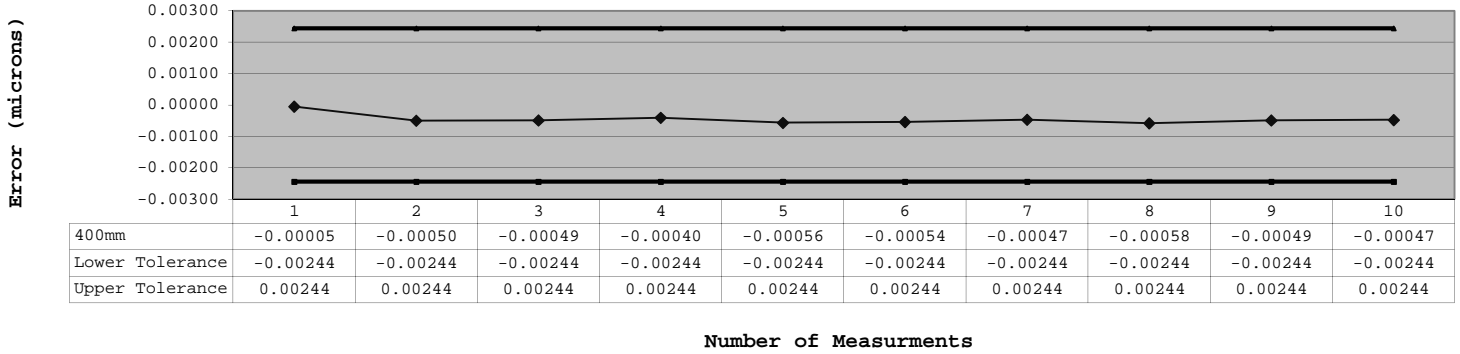
Y Axis Outside (after) 300mm



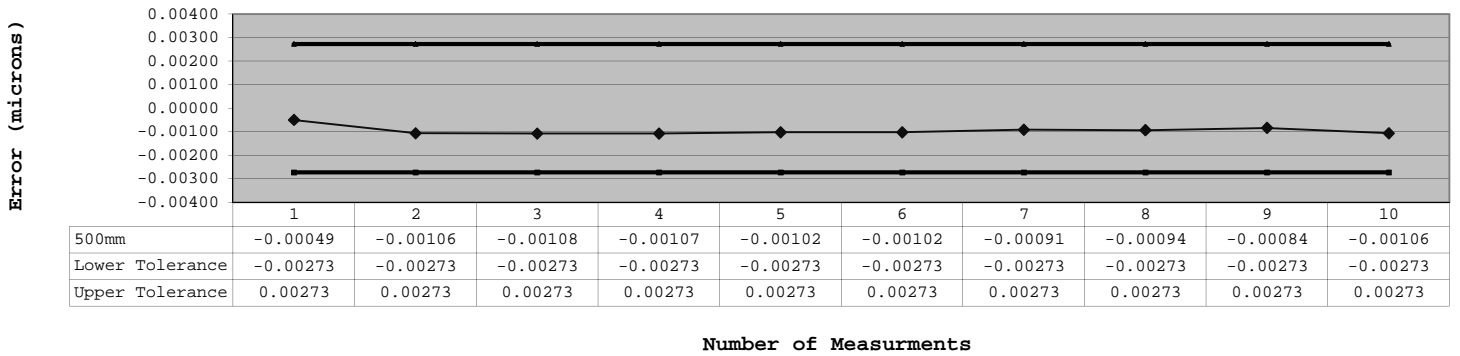
CMM Specialists

Graphed Errors and Averages

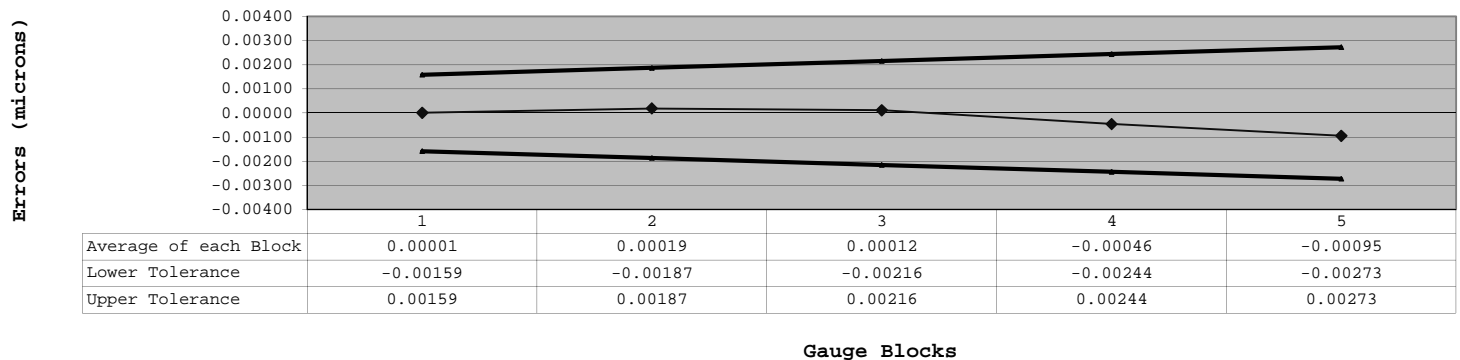
Y Axis Outside (after) 400mm



Y Axis Outside (after) 500mm



Y axis Outside (after) Average



Y Axis Outside (after)

U1 Spec.=

1.3

+ L /

350

100mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
99.99988	99.99883	-0.00105	-0.00159	0.00159	-66.42%
99.99988	100.00006	0.00018	-0.00159	0.00159	11.65%
99.99988	99.99994	0.00006	-0.00159	0.00159	4.02%
99.99988	100.00004	0.00016	-0.00159	0.00159	10.32%
99.99988	99.99998	0.00010	-0.00159	0.00159	6.50%
99.99988	100.00002	0.00014	-0.00159	0.00159	8.77%
99.99988	100.00002	0.00014	-0.00159	0.00159	8.90%
99.99988	99.99996	0.00008	-0.00159	0.00159	5.35%
99.99988	100.00003	0.00015	-0.00159	0.00159	9.23%
99.99988	100.00002	0.00014	-0.00159	0.00159	8.72%
avg.	99.99989	0.00001	-0.00159	0.00159	0.71%

200mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
200.00029	200.00070	0.00041	-0.00187	0.00187	22.08%
200.00029	200.00047	0.00018	-0.00187	0.00187	9.60%
200.00029	200.00035	0.00006	-0.00187	0.00187	3.08%
200.00029	200.00055	0.00026	-0.00187	0.00187	13.88%
200.00029	200.00044	0.00015	-0.00187	0.00187	8.01%
200.00029	200.00048	0.00019	-0.00187	0.00187	10.03%
200.00029	200.00042	0.00013	-0.00187	0.00187	6.87%
200.00029	200.00049	0.00020	-0.00187	0.00187	10.45%
200.00029	200.00037	0.00008	-0.00187	0.00187	4.46%
200.00029	200.00049	0.00020	-0.00187	0.00187	10.46%
avg.	200.00048	0.00019	-0.00187	0.00187	9.89%

300mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
299.99982	300.00029	0.00047	-0.00216	0.00216	21.68%
299.99982	299.99991	0.00009	-0.00216	0.00216	4.03%
299.99982	299.99982	0.00000	-0.00216	0.00216	-0.19%
299.99982	299.99993	0.00011	-0.00216	0.00216	4.99%
299.99982	299.99986	0.00004	-0.00216	0.00216	1.78%
299.99982	299.99998	0.00016	-0.00216	0.00216	7.19%
299.99982	299.99991	0.00009	-0.00216	0.00216	4.25%
299.99982	299.99995	0.00013	-0.00216	0.00216	5.97%
299.99982	299.99990	0.00008	-0.00216	0.00216	3.74%
299.99982	299.99986	0.00004	-0.00216	0.00216	1.87%
avg.	299.99994	0.00012	-0.00216	0.00216	5.53%

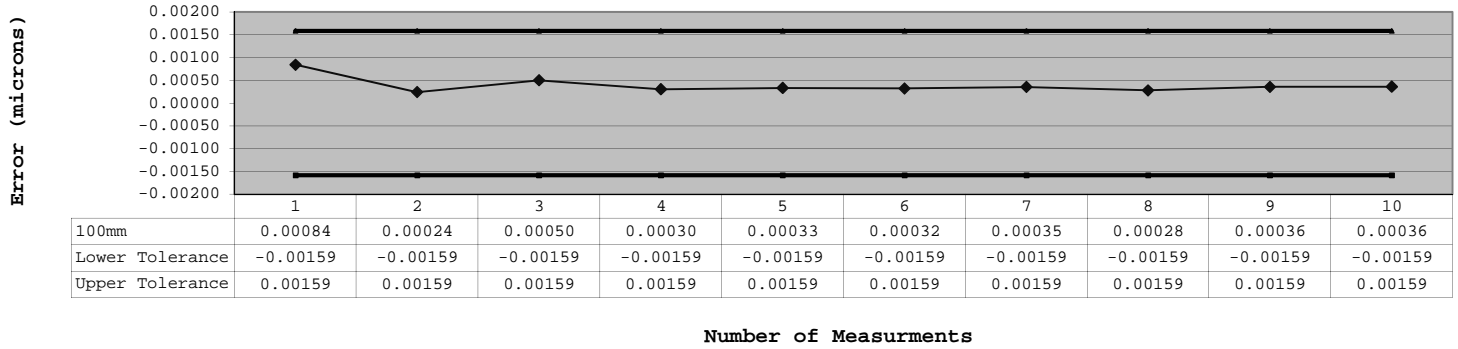
400mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
400.00055	400.00050	-0.00005	-0.00244	0.00244	-2.17%
400.00055	400.00005	-0.00050	-0.00244	0.00244	-20.37%
400.00055	400.00006	-0.00049	-0.00244	0.00244	-20.07%
400.00055	400.00015	-0.00040	-0.00244	0.00244	-16.51%
400.00055	399.99999	-0.00056	-0.00244	0.00244	-23.05%
400.00055	400.00001	-0.00054	-0.00244	0.00244	-22.08%
400.00055	400.00008	-0.00047	-0.00244	0.00244	-19.15%
400.00055	399.99997	-0.00058	-0.00244	0.00244	-23.83%
400.00055	400.00006	-0.00049	-0.00244	0.00244	-20.09%
400.00055	400.00008	-0.00047	-0.00244	0.00244	-19.35%
avg.	400.00009	-0.00046	-0.00244	0.00244	-18.67%

500mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
500.00011	499.99962	-0.00049	-0.00273	0.00273	-18.14%
500.00011	499.99905	-0.00106	-0.00273	0.00273	-38.90%
500.00011	499.99903	-0.00108	-0.00273	0.00273	-39.48%
500.00011	499.99904	-0.00107	-0.00273	0.00273	-39.28%
500.00011	499.99909	-0.00102	-0.00273	0.00273	-37.53%
500.00011	499.99909	-0.00102	-0.00273	0.00273	-37.24%
500.00011	499.99920	-0.00091	-0.00273	0.00273	-33.34%
500.00011	499.99917	-0.00094	-0.00273	0.00273	-34.34%
500.00011	499.99927	-0.00084	-0.00273	0.00273	-30.73%
500.00011	499.99905	-0.00106	-0.00273	0.00273	-38.90%
avg.	499.99916	-0.00095	-0.00273	0.00273	-34.79%

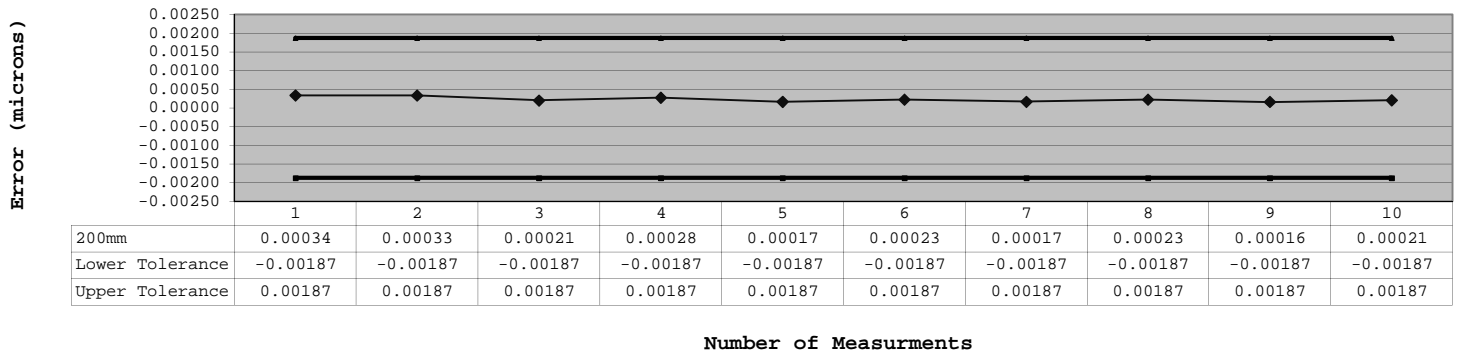
CMM Specialists

Graphed errors and Averages

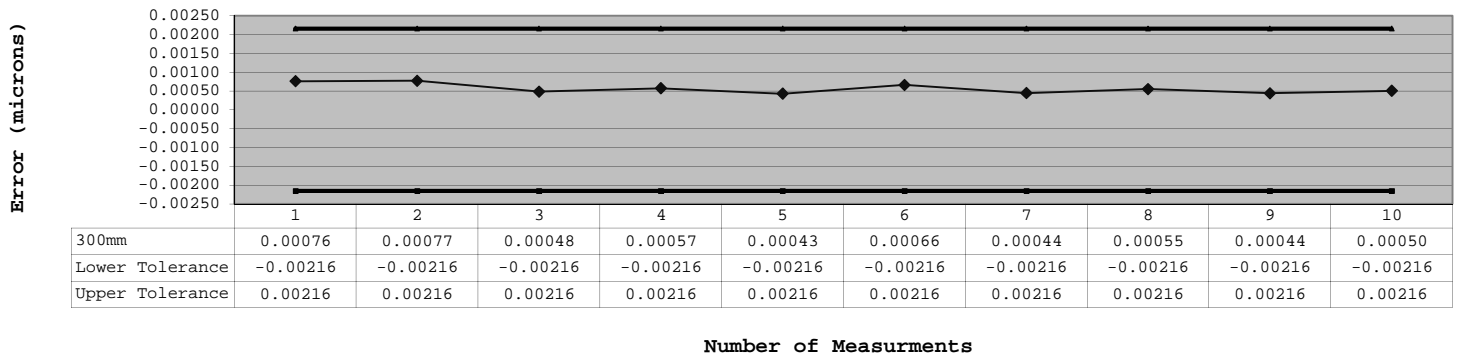
Y Axis Inside (after) 100mm



Y Axis Inside (after) 200mm



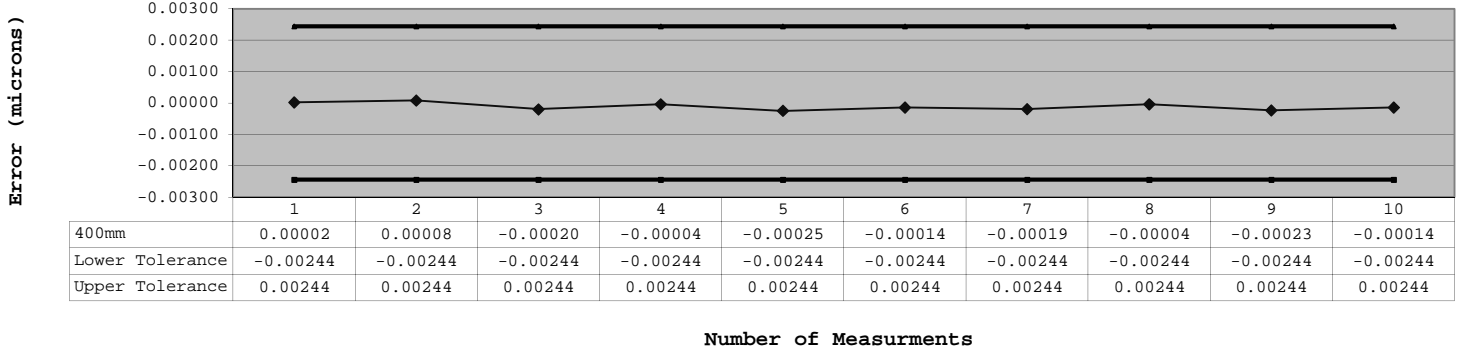
Y Axis Inside (after) 300mm



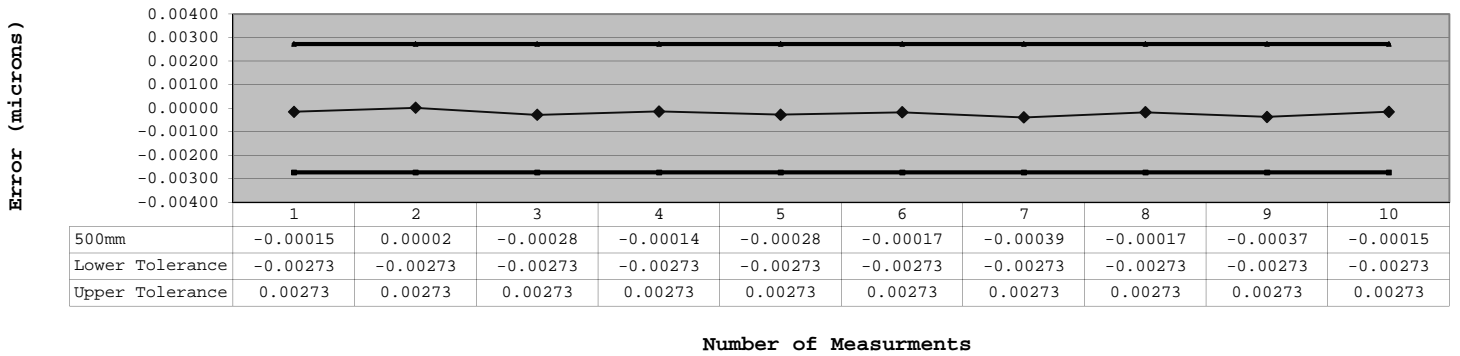
CMM Specialists

Graphed errors and Averages

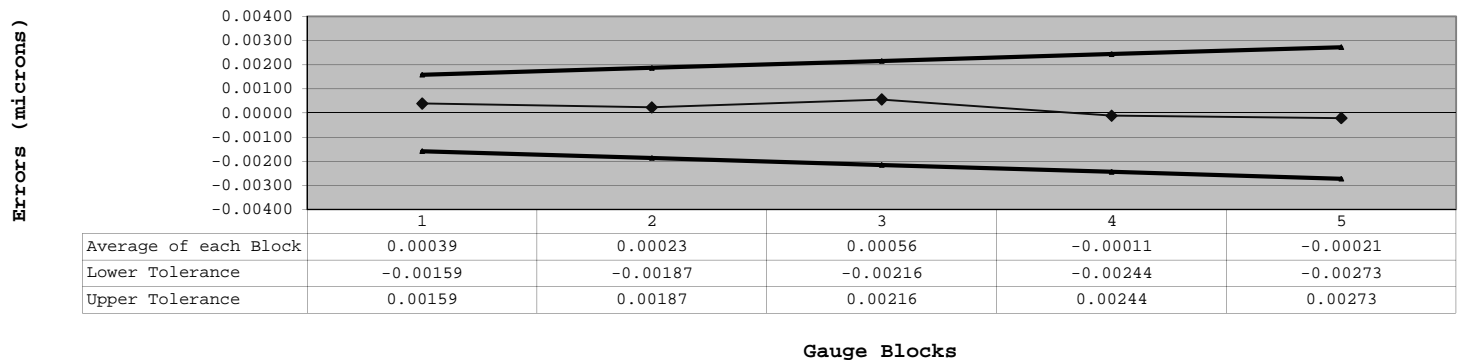
Y Axis Inside (after) 400mm



Y Axis Inside (after) 500mm



Y axis Inside (after) Average



Y Axis Inside (after)

U1 Spec.=

1.3

+ L /

350

100mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
99.99988	100.00072	0.00084	-0.00159	0.00159	53.28%
99.99988	100.00012	0.00024	-0.00159	0.00159	15.12%
99.99988	100.00038	0.00050	-0.00159	0.00159	31.47%
99.99988	100.00018	0.00030	-0.00159	0.00159	19.01%
99.99988	100.00021	0.00033	-0.00159	0.00159	20.90%
99.99988	100.00020	0.00032	-0.00159	0.00159	20.31%
99.99988	100.00023	0.00035	-0.00159	0.00159	22.24%
99.99988	100.00016	0.00028	-0.00159	0.00159	17.86%
99.99988	100.00024	0.00036	-0.00159	0.00159	22.55%
99.99988	100.00024	0.00036	-0.00159	0.00159	22.63%
avg.	100.00027	0.00039	-0.00159	0.00159	24.54%

200mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
200.00029	200.00063	0.00034	-0.00187	0.00187	18.10%
200.00029	200.00062	0.00033	-0.00187	0.00187	17.84%
200.00029	200.00050	0.00021	-0.00187	0.00187	11.01%
200.00029	200.00057	0.00028	-0.00187	0.00187	14.92%
200.00029	200.00046	0.00017	-0.00187	0.00187	9.05%
200.00029	200.00052	0.00023	-0.00187	0.00187	12.08%
200.00029	200.00046	0.00017	-0.00187	0.00187	9.19%
200.00029	200.00052	0.00023	-0.00187	0.00187	12.12%
200.00029	200.00045	0.00016	-0.00187	0.00187	8.57%
200.00029	200.00050	0.00021	-0.00187	0.00187	11.11%
avg.	200.00052	0.00023	-0.00187	0.00187	12.40%

300mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
299.99982	300.00058	0.00076	-0.00216	0.00216	35.21%
299.99982	300.00059	0.00077	-0.00216	0.00216	35.71%
299.99982	300.00030	0.00048	-0.00216	0.00216	22.28%
299.99982	300.00039	0.00057	-0.00216	0.00216	26.43%
299.99982	300.00025	0.00043	-0.00216	0.00216	19.85%
299.99982	300.00048	0.00066	-0.00216	0.00216	30.54%
299.99982	300.00026	0.00044	-0.00216	0.00216	20.51%
299.99982	300.00037	0.00055	-0.00216	0.00216	25.46%
299.99982	300.00026	0.00044	-0.00216	0.00216	20.29%
299.99982	300.00032	0.00050	-0.00216	0.00216	23.29%
avg.	300.00038	0.00056	-0.00216	0.00216	25.96%

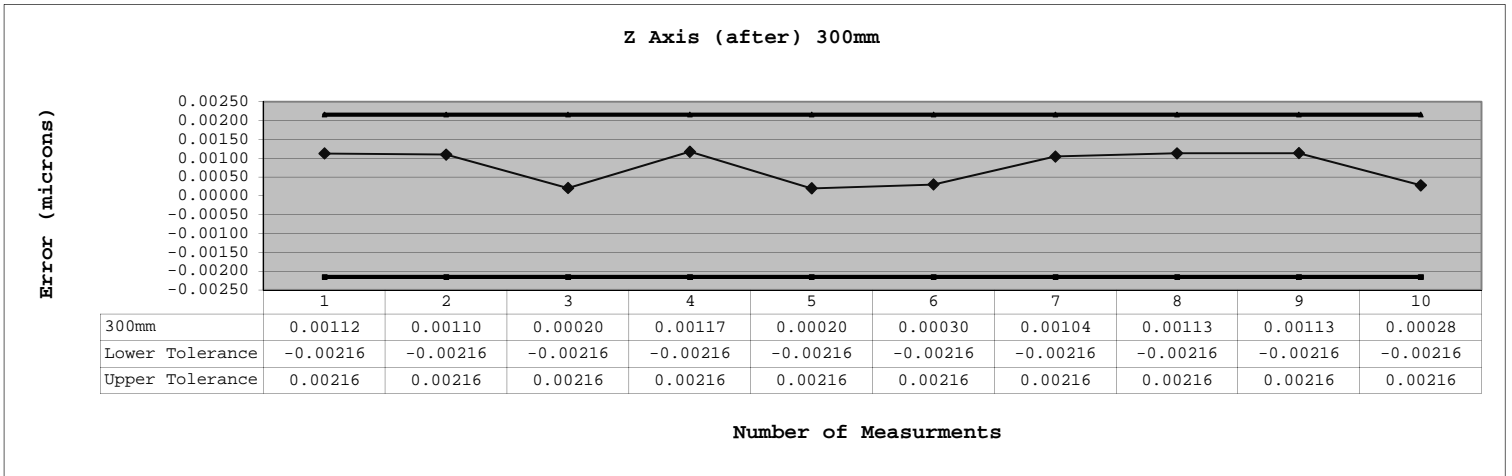
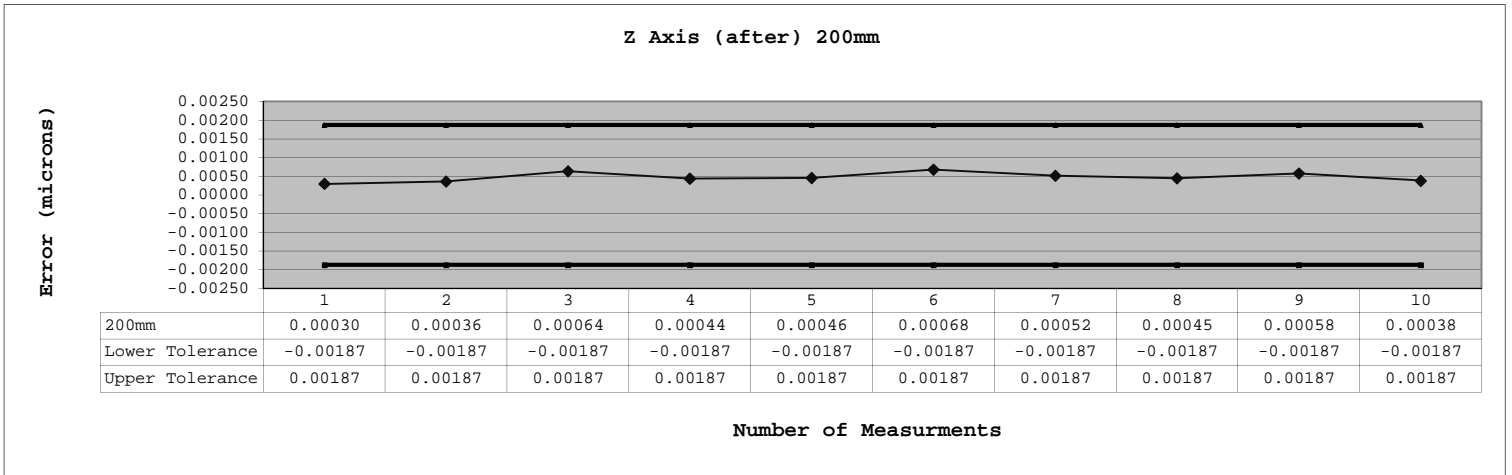
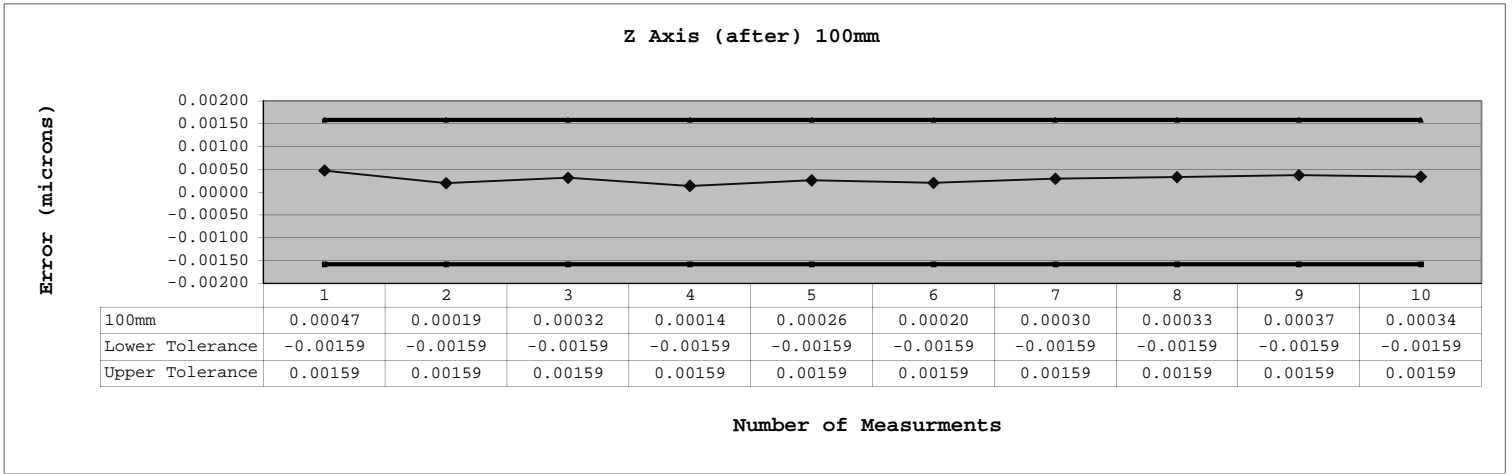
8/6/2019

400mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
400.00055	400.00057	0.00002	-0.00244	0.00244	0.92%
400.00055	400.00063	0.00008	-0.00244	0.00244	3.25%
400.00055	400.00035	-0.00020	-0.00244	0.00244	-8.00%
400.00055	400.00051	-0.00004	-0.00244	0.00244	-1.56%
400.00055	400.00030	-0.00025	-0.00244	0.00244	-10.27%
400.00055	400.00041	-0.00014	-0.00244	0.00244	-5.93%
400.00055	400.00036	-0.00019	-0.00244	0.00244	-7.92%
400.00055	400.00051	-0.00004	-0.00244	0.00244	-1.56%
400.00055	400.00032	-0.00023	-0.00244	0.00244	-9.61%
400.00055	400.00041	-0.00014	-0.00244	0.00244	-5.93%
avg.	400.00044	-0.00011	-0.00244	0.00244	-4.66%

500mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
500.00011	499.99996	-0.00015	-0.00273	0.00273	-5.57%
500.00011	500.00013	0.00002	-0.00273	0.00273	0.69%
500.00011	499.99983	-0.00028	-0.00273	0.00273	-10.34%
500.00011	499.99997	-0.00014	-0.00273	0.00273	-5.02%
500.00011	499.99983	-0.00028	-0.00273	0.00273	-10.12%
500.00011	499.99994	-0.00017	-0.00273	0.00273	-6.40%
500.00011	499.99972	-0.00039	-0.00273	0.00273	-14.44%
500.00011	499.99994	-0.00017	-0.00273	0.00273	-6.41%
500.00011	499.99974	-0.00037	-0.00273	0.00273	-13.61%
500.00011	499.99996	-0.00015	-0.00273	0.00273	-5.41%
avg.	499.99990	-0.00021	-0.00273	0.00273	-7.66%

CMM Specialists

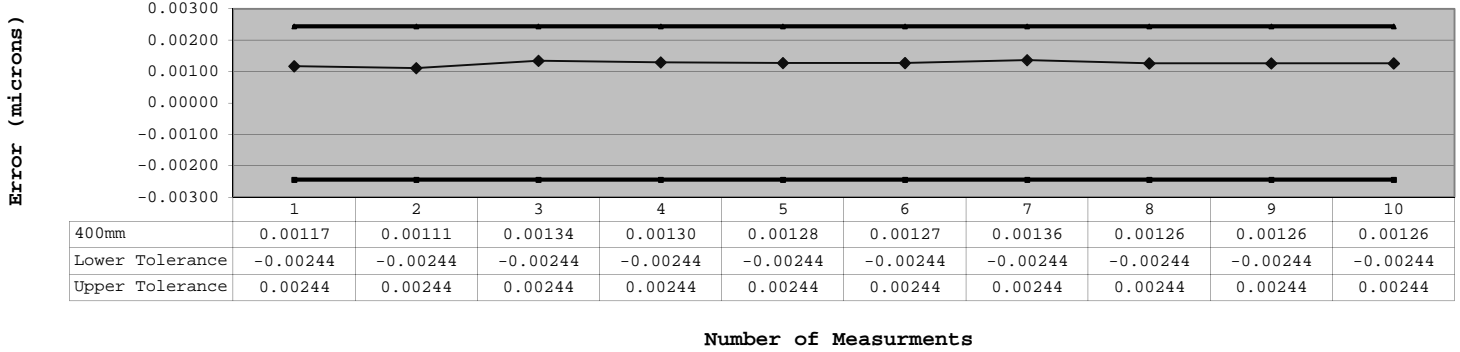
Graphed Errors and Averages



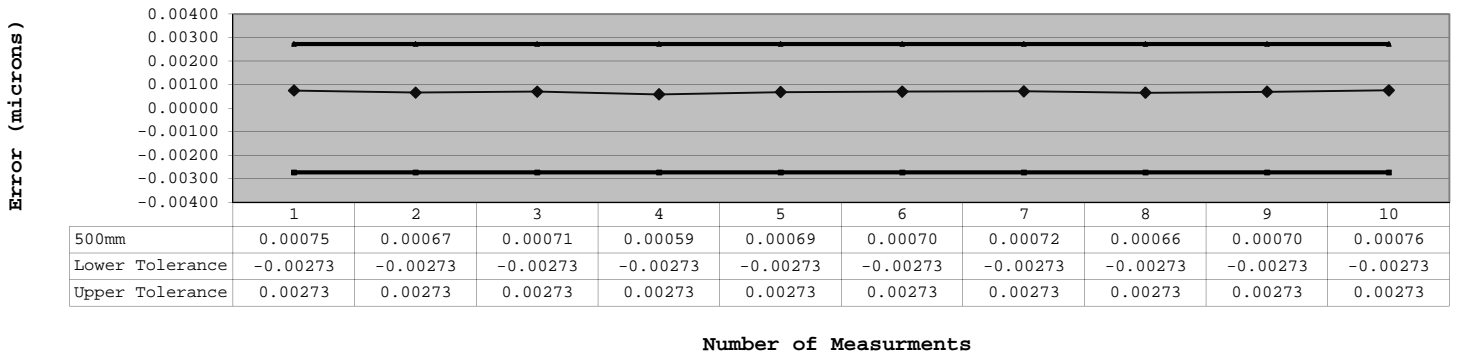
CMM Specialists

Graphed Errors and Averages

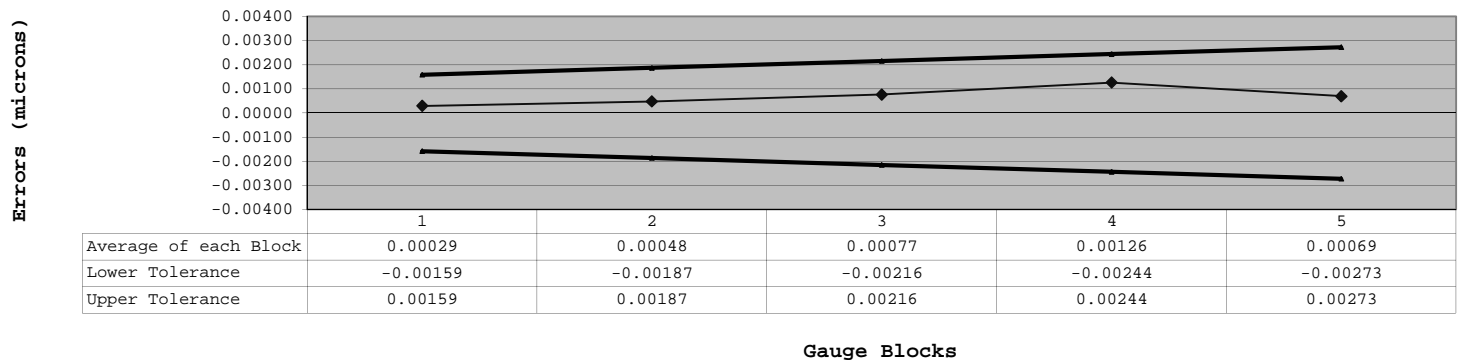
Z Axis (after) 400mm



Z Axis (after) 500mm



Z Axis (after) Average



Z Axis (after)

U1 Spec.=

1.3

+ L /

350

100mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
99.99988	100.00035	0.00047	-0.00159	0.00159	29.84%
99.99988	100.00008	0.00019	-0.00159	0.00159	12.30%
99.99988	100.00020	0.00032	-0.00159	0.00159	19.88%
99.99988	100.00002	0.00014	-0.00159	0.00159	8.58%
99.99988	100.00014	0.00026	-0.00159	0.00159	16.25%
99.99988	100.00008	0.00020	-0.00159	0.00159	12.82%
99.99988	100.00018	0.00030	-0.00159	0.00159	18.61%
99.99988	100.00021	0.00033	-0.00159	0.00159	20.73%
99.99988	100.00025	0.00037	-0.00159	0.00159	23.50%
99.99988	100.00022	0.00034	-0.00159	0.00159	21.27%
avg.	100.00017	0.00029	-0.00159	0.00159	18.38%

200mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
200.00029	200.00059	0.00030	-0.00187	0.00187	15.92%
200.00029	200.00065	0.00036	-0.00187	0.00187	19.38%
200.00029	200.00093	0.00064	-0.00187	0.00187	34.08%
200.00029	200.00073	0.00044	-0.00187	0.00187	23.48%
200.00029	200.00075	0.00046	-0.00187	0.00187	24.41%
200.00029	200.00097	0.00068	-0.00187	0.00187	36.45%
200.00029	200.00081	0.00052	-0.00187	0.00187	27.63%
200.00029	200.00074	0.00045	-0.00187	0.00187	24.17%
200.00029	200.00087	0.00058	-0.00187	0.00187	31.00%
200.00029	200.00067	0.00038	-0.00187	0.00187	20.54%
avg.	200.00077	0.00048	-0.00187	0.00187	25.70%

300mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
299.99982	300.00094	0.00112	-0.00216	0.00216	52.12%
299.99982	300.00092	0.00110	-0.00216	0.00216	50.92%
299.99982	300.00002	0.00020	-0.00216	0.00216	9.46%
299.99982	300.00099	0.00117	-0.00216	0.00216	54.26%
299.99982	300.00002	0.00020	-0.00216	0.00216	9.04%
299.99982	300.00012	0.00030	-0.00216	0.00216	13.79%
299.99982	300.00086	0.00104	-0.00216	0.00216	48.26%
299.99982	300.00095	0.00113	-0.00216	0.00216	52.41%
299.99982	300.00095	0.00113	-0.00216	0.00216	52.52%
299.99982	300.00010	0.00028	-0.00216	0.00216	13.02%
avg.	300.00059	0.00077	-0.00216	0.00216	35.58%

400mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
400.00055	400.00172	0.00117	-0.00244	0.00244	47.90%
400.00055	400.00166	0.00111	-0.00244	0.00244	45.48%
400.00055	400.00189	0.00134	-0.00244	0.00244	54.96%
400.00055	400.00185	0.00130	-0.00244	0.00244	53.12%
400.00055	400.00183	0.00128	-0.00244	0.00244	52.42%
400.00055	400.00182	0.00127	-0.00244	0.00244	52.14%
400.00055	400.00191	0.00136	-0.00244	0.00244	55.86%
400.00055	400.00181	0.00126	-0.00244	0.00244	51.72%
400.00055	400.00181	0.00126	-0.00244	0.00244	51.60%
400.00055	400.00181	0.00126	-0.00244	0.00244	51.74%
avg.	400.00181	0.00126	-0.00244	0.00244	51.69%

500mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
500.00011	500.00086	0.00075	-0.00273	0.00273	27.49%
500.00011	500.00078	0.00067	-0.00273	0.00273	24.40%
500.00011	500.00082	0.00071	-0.00273	0.00273	26.13%
500.00011	500.00070	0.00059	-0.00273	0.00273	21.67%
500.00011	500.00080	0.00069	-0.00273	0.00273	25.16%
500.00011	500.00081	0.00070	-0.00273	0.00273	25.82%
500.00011	500.00083	0.00072	-0.00273	0.00273	26.21%
500.00011	500.00077	0.00066	-0.00273	0.00273	24.21%
500.00011	500.00081	0.00070	-0.00273	0.00273	25.66%
500.00011	500.00087	0.00076	-0.00273	0.00273	27.78%
avg.	500.00080	0.00069	-0.00273	0.00273	25.45%

Spatial 1

U3 Spec.=

1.6

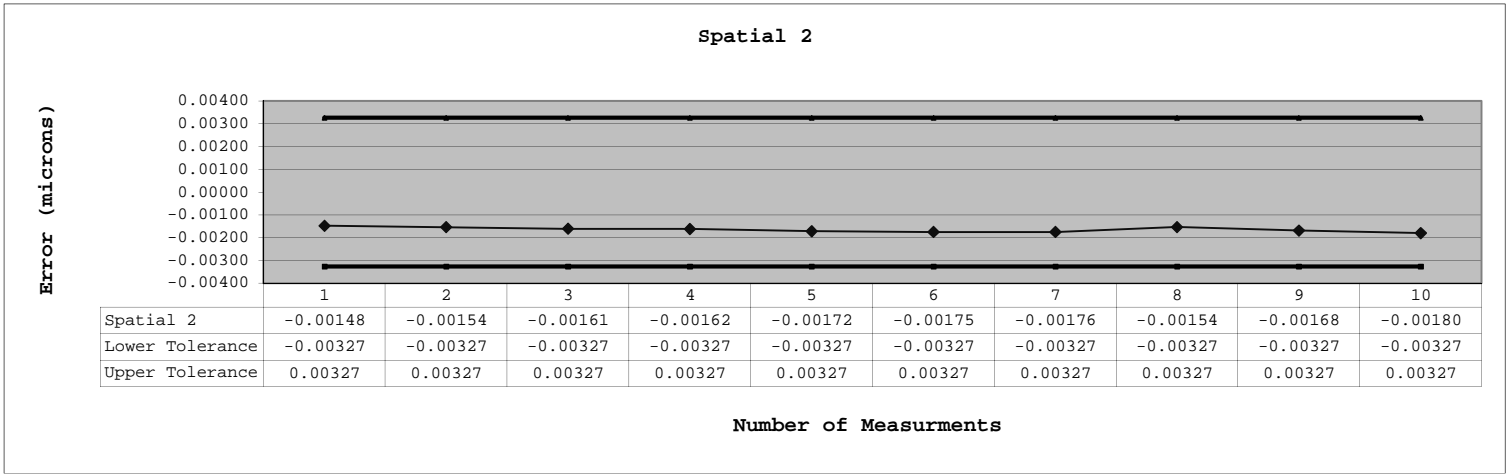
+ L /

300

500mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
500.00011	499.99845	-0.00166	-0.00327	0.00327	-50.73%
500.00011	499.99844	-0.00167	-0.00327	0.00327	-50.98%
500.00011	499.99850	-0.00161	-0.00327	0.00327	-49.36%
500.00011	499.99847	-0.00164	-0.00327	0.00327	-50.24%
500.00011	499.99835	-0.00176	-0.00327	0.00327	-53.95%
500.00011	499.99842	-0.00169	-0.00327	0.00327	-51.61%
500.00011	499.99826	-0.00185	-0.00327	0.00327	-56.76%
500.00011	499.99835	-0.00176	-0.00327	0.00327	-53.78%
500.00011	499.99827	-0.00184	-0.00327	0.00327	-56.45%
500.00011	499.99840	-0.00171	-0.00327	0.00327	-52.34%
avg.	499.99839	-0.00172	-0.00327	0.00327	-52.62%

CMM Specialists

Graphed Errors and Averages



8/6/2019

CMM Specialists

Graphed Errors and Averages

8/6/2019

Spatial 2

U3 Spec.=

1.6

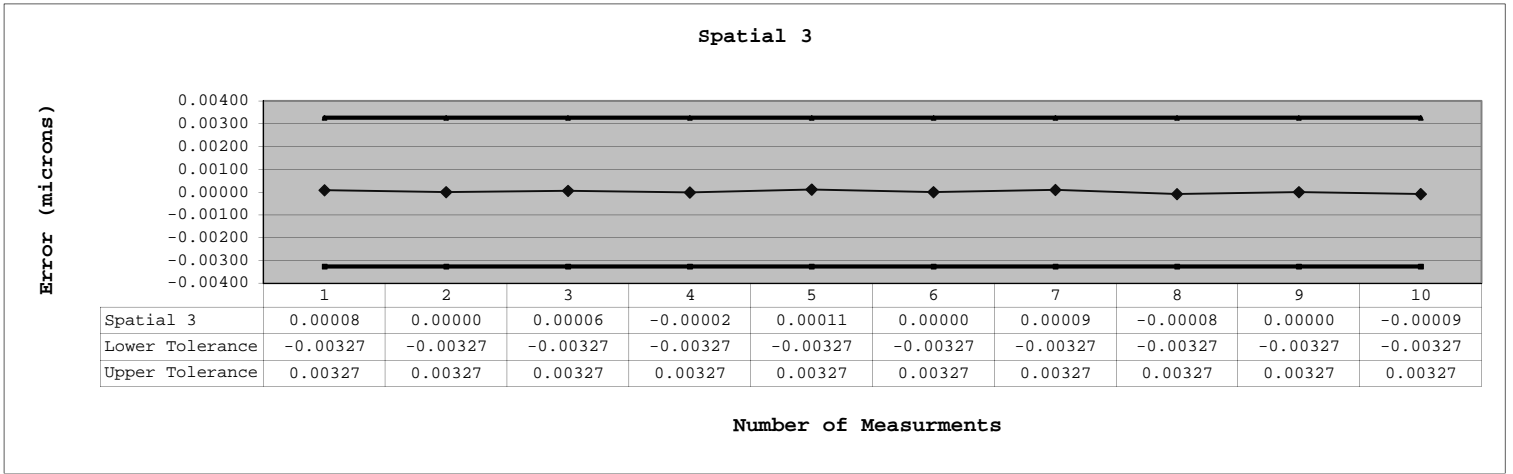
+ L /

300

500mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
500.00011	499.99863	-0.00148	-0.00327	0.00327	-45.23%
500.00011	499.99857	-0.00154	-0.00327	0.00327	-47.24%
500.00011	499.99850	-0.00161	-0.00327	0.00327	-49.26%
500.00011	499.99849	-0.00162	-0.00327	0.00327	-49.50%
500.00011	499.99839	-0.00172	-0.00327	0.00327	-52.52%
500.00011	499.99836	-0.00175	-0.00327	0.00327	-53.57%
500.00011	499.99835	-0.00176	-0.00327	0.00327	-53.76%
500.00011	499.99857	-0.00154	-0.00327	0.00327	-47.07%
500.00011	499.99843	-0.00168	-0.00327	0.00327	-51.56%
500.00011	499.99831	-0.00180	-0.00327	0.00327	-55.02%
avg.	499.99846	-0.00165	-0.00327	0.00327	-50.47%

CMM Specialists

Graphed Errors and Averages



8/6/2019

CMM Specialists

Graphed Errors and Averages

8/6/2019

Spatial 3

U3 Spec.=

1.6

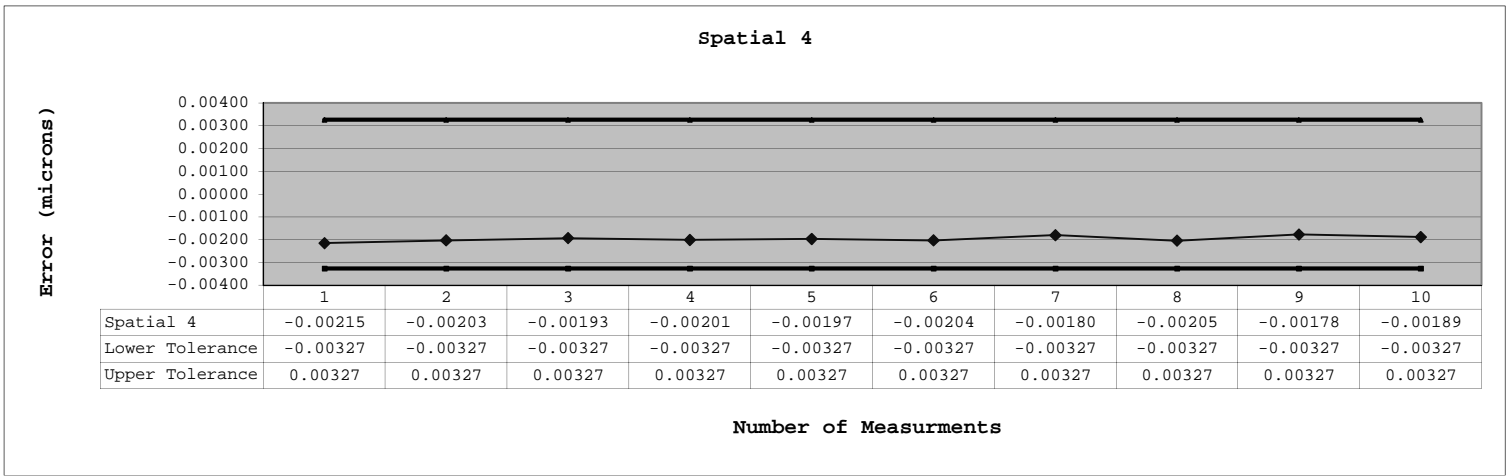
+ L /

300

500mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
500.00011	500.00019	0.00008	-0.00327	0.00327	2.42%
500.00011	500.00011	0.00000	-0.00327	0.00327	-0.02%
500.00011	500.00017	0.00006	-0.00327	0.00327	1.71%
500.00011	500.00009	-0.00002	-0.00327	0.00327	-0.60%
500.00011	500.00022	0.00011	-0.00327	0.00327	3.36%
500.00011	500.00011	0.00000	-0.00327	0.00327	0.14%
500.00011	500.00020	0.00009	-0.00327	0.00327	2.85%
500.00011	500.00003	-0.00008	-0.00327	0.00327	-2.57%
500.00011	500.00011	0.00000	-0.00327	0.00327	0.06%
500.00011	500.00002	-0.00009	-0.00327	0.00327	-2.65%
avg.	500.00013	0.00002	-0.00327	0.00327	0.47%

CMM Specialists

Graphed Errors and Averages



8/6/2019

CMM Specialists

Graphed Errors and Averages

8/6/2019

Spatial 4

U3 Spec.=

1.6

+ L /

300

500mm					
<i>Nominal</i>	<i>Actual</i>	<i>Deviation</i>	<i>Tolerance</i>		<i>% Used</i>
500.00011	499.99796	-0.00215	-0.00327	0.00327	-65.94%
500.00011	499.99808	-0.00203	-0.00327	0.00327	-62.23%
500.00011	499.99818	-0.00193	-0.00327	0.00327	-59.13%
500.00011	499.99810	-0.00201	-0.00327	0.00327	-61.67%
500.00011	499.99814	-0.00197	-0.00327	0.00327	-60.25%
500.00011	499.99807	-0.00204	-0.00327	0.00327	-62.34%
500.00011	499.99831	-0.00180	-0.00327	0.00327	-55.22%
500.00011	499.99806	-0.00205	-0.00327	0.00327	-62.63%
500.00011	499.99833	-0.00178	-0.00327	0.00327	-54.36%
500.00011	499.99822	-0.00189	-0.00327	0.00327	-57.79%
avg.	499.99814	-0.00197	-0.00327	0.00327	-60.16%