



# National Association for Proficiency Testing

*A Non-Profit Organization Dedicated to Excellence in Metrology and Test Measurement*

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## NAPT-RGSP-101 FINAL REPORT

**Date Of Final Report:** August 01, 2005

Report on Test#: 3681

**Date Of Participation:** May 23, 2005

Issued To: **Digital Measurement Metrology**

Attention: Bassant Gobin

26 Automatic Road, Unit 4

Brampton, ON L6S 5N7

Dear Participant:

Enclosed please find your copy of the NAPT-RGSP-101 Proficiency Report. Your results have been identified as Test# 3681 throughout the report. Thank-you for participating in this evaluation and I look forward to your participation in additional proficiency tests conducted by NAPT.

The analysis presented in this report is in accordance with international quality standards, ISO/IEC Guide 43 and ILAC-G13:2000. The attachments present the values reported to NAPT and their associated uncertainties. The individual performance indicators presented are the reference values of the artifact, the reference uncertainties, the participants reported values, En values, Z-Scores, S/U (satisfactory/unsatisfactory) performance indicators, I-W-O (in/within/out) ratings, mean value of participants that performed satisfactory and mean values of all participants. Graphs are included to show a graphical representation of the data submitted.

All artifacts used in this ILC/PT are commercially available instruments, chosen based on their ability to provide the wide characterization and spectrum needed. Specific nominal set points for measurement were determined prior to distribution of the artifact(s). Participants were instructed to calibrate the artifact(s) using their standard calibration procedures. The artifact were calibrated against standards traceable to the SI (In most cases the National Institute of Standards & Technology) or where appropriate an accepted value of a natural physical constant.

For additional/in-depth information on interpretation of results presented, please refer to NAPT's Guidance Document on Interpretation of Reports issued by NAPT.

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Any additional questions regarding this proficiency test should be directed to the Managing Director of the National Association for Proficiency Testing.



# National Association for Proficiency Testing

*A Non-Profit Organization Dedicated to Excellence in Metrology Test Measurement*

## FINAL REPORT

for

## NAPT-RGSP-101

This report documents the results from an ILC/PT conducted by the National Association for Proficiency Testing.

**Discipline:** Dimensional  
36 X 48 Surface Plate

Date Of Final Report: August 01, 2005  
**Report on Test#: 3681**

**Artifact Information:** Manufacturer: Not Identified

Measurement Description	Measurement	Reference Value	Reference Uncertainty
<b>Dimensional</b>			
Lower Left Corner	2.000000 Inch	0.000003	0.000088
Upper Righth Corner	100.000000 Inch	0.000066	0.000088
Lower Right Corner	30.000000 Inch	0.000043	0.000088
Upper Left Corner	75.000000 Inch	0.000077	0.000088
Middle Left	25.000000 Inch	0.000016	0.000088
Middle Right	100.000000 Inch	0.000072	0.000088
Lower Center	100.000000 Inch	0.000065	0.000088
Upper Center	140.000000 Inch	0.000063	0.000088
Overall Flatness	150.000000 Inch	0.000239	0.000088



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## ILC/PT DATA: NAPT-RGSP-101

### Individual Participant Results

This section of the report documents your results for each measurement point. Analysis of the data your organization submitted to NAPT is shown below. In this chart your reported values are compared against reference data only.

**Date Of Participation:** May 23, 2005

**Report on Test#: 3681**

**Date Of Final Report:** August 01, 2005

Measurement Description	Reported Value Reference Value	Reported Uncertainty Reference Uncertainty	En	S/U	I/W/O
<i>Dimensional</i>					
2 Inch - Lower Left Corner	0.000022 Inch 0.000003	0.000082 0.000088	0.16	S	I
100 inch - Upper Righth Corner	0.000027 Inch 0.000066	0.000082 0.000088	-0.33	S	I
30 inch - Lower Right Corner	0.000023 Inch 0.000043	0.000082 0.000088	-0.17	S	I
75 inch - Upper Left Corner	0.000037 Inch 0.000077	0.000082 0.000088	-0.33	S	I
25 inch - Middle Left	0.000019 Inch 0.000016	0.000082 0.000088	0.03	S	I
100 inch - Middle Right	0.000037 Inch 0.000072	0.000082 0.000088	-0.29	S	I
100 inch - Lower Center	-0.000011 Inch 0.000065	0.000082 0.000088	-0.63	S	I
140 inch - Upper Center	0.000080 Inch 0.000063	0.000082 0.000088	0.14	S	I
150 inch - Overall Flatness	0.000262 Inch 0.000239	0.000082 0.000088	0.2	S	I

#### NOTES:

1. All uncertainties are at (or normalized to) K=2 (coverage factor associated with a 2-sigma, 95%, normal distribution)
2.  $En = (\text{participant's reported value} - \text{reference value}) / \text{SQRT}(\text{participant's reported uncertainty}^2 + \text{reference uncertainty}^2)$
3. S/U: S (Satisfactory) = participant's computed En is within range of  $\pm 1$ ; U (Unsatisfactory) = participant's computed En is outside range of  $\pm 1$
4. Values marked with an \* are extreme outliers and excluded from the Mean Value (all results)



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## ILC/PT DATA: NAPT-RGSP-101

### Group Comparisons

This section of the report presents comparisons of the performance of all participants against each other and against reference data for each nominal set point. Data is shown in both tabular and graphical format.

#### MEASUREMENT DESCRIPTION: Dimensional Lower Left Corner

<b>NOMINAL VALUE:</b>	2 Inch	<b>MEAN VALUE (Satisfactory Results):</b>	0.000003
<b>REFERENCE VALUE:</b>	0.000003	<b>MEAN VALUE (All Results):</b>	0.000021
<b>REFERENCE UNCERTAINTY:</b>	0.000088		

Date Of Final Report: August 01, 2005

<i>Test #</i>	<i>Reported Value</i>	<i>Reported Uncertainty</i>	<i>En</i>	<i>S/U</i>	<i>IWO</i>
3678	-0.000140	0.00011	-1.01	U	W
3679	0.000140	0.00079	0.17	S	W
3680	-0.000020	0.000094	-0.18	S	I
3681	0.000022	0.000082	0.16	S	I
3682	0.000040	0.0001	0.28	S	I
3683	-0.000032	0.000036	-0.37	S	I
3764	0.000002	0.000082	-0.01	S	I
3765	0.000010	0.000084	0.06	S	I
3770	0.000004	0.000093	0.01	S	I

# PROFICIENCY TEST DATA (Continuation)

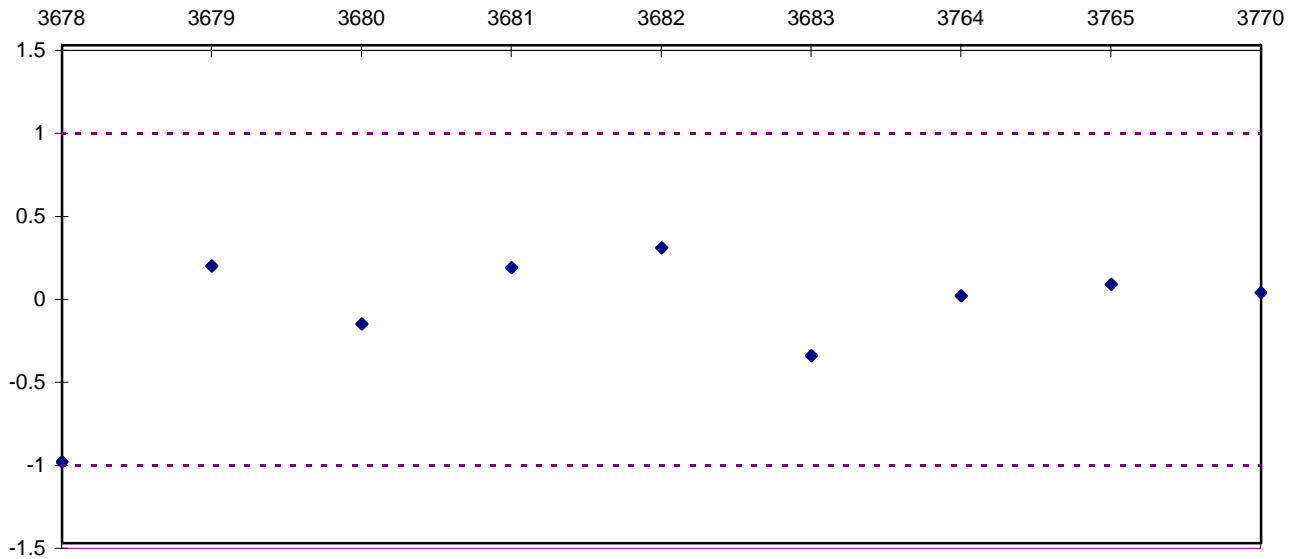
## Measurement Points

NAPT-RGSP-101

Nominal Value: 2 Inch

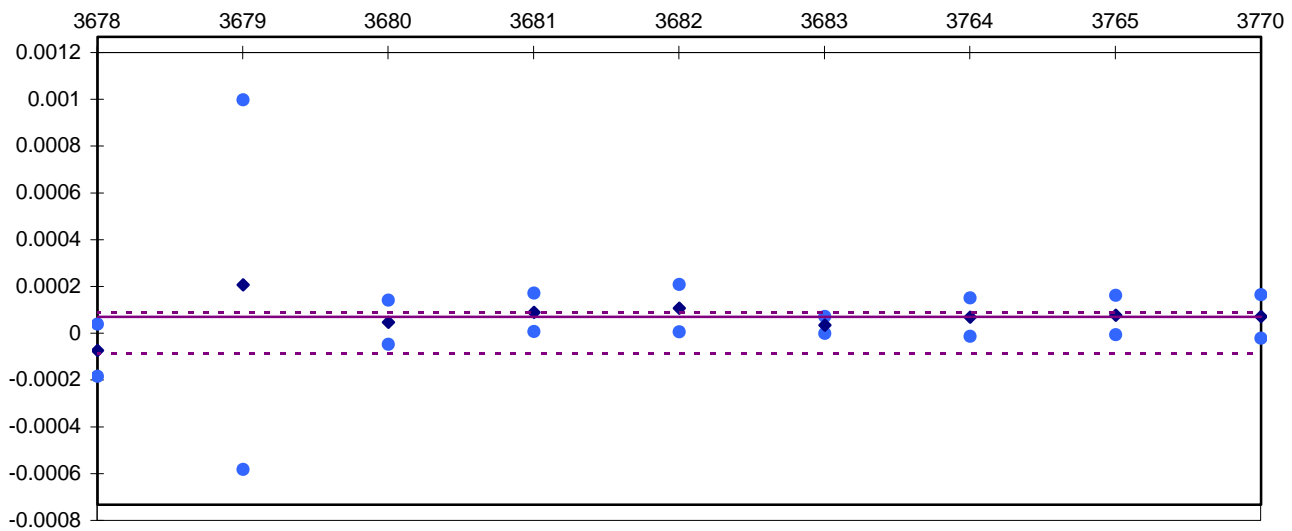
Lower Left Corner

Computed En Values



$$En = (\text{Lab Mean} - \text{STD Value}) / (\text{SQRT}(\text{Lab Uncert}^2 + \text{STD Uncert}^2))$$

Meas Value and Uncert.  
Std Value and Uncert. - Horz. Lines



Means - Low Value: Mean - Uncertainty // Middle Value: Mean // High Value: Mean + Uncertainty

8100 Wayzata Boulevard  
St. Louis Park, MN 55426  
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Website: [www.proficiency.org](http://www.proficiency.org) - Email: [napt@proficiency.org](mailto:napt@proficiency.org)



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## ILC/PT DATA: NAPT-RGSP-101

### Group Comparisons

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#### MEASUREMENT DESCRIPTION: Dimensional Upper Righth Corner

NOMINAL VALUE:	100 inch	MEAN VALUE (Satisfactory Results):	0.000087
REFERENCE VALUE:	0.000066	MEAN VALUE (All Results):	0.000146
REFERENCE UNCERTAINTY:	0.000088		

Date Of Final Report: August 01, 2005

<i>Test #</i>	<i>Reported Value</i>	<i>Reported Uncertainty</i>	<i>En</i>	<i>S/U</i>	<i>IWO</i>
3678	-0.000200	0.00011	-1.87	U	O
3679	0.000800	0.00079	0.92	S	W
3680	0.000020	0.000094	-0.36	S	I
3681	0.000027	0.000082	-0.33	S	I
3682	0.000020	0.0001	-0.34	S	I
3683	-0.000036	0.000036	-1.07	U	W
3764	0.000105	0.000082	0.33	S	I
3765	0.000024	0.000084	-0.35	S	I
3770	0.000027	0.000093	-0.31	S	I

# PROFICIENCY TEST DATA (Continuation)

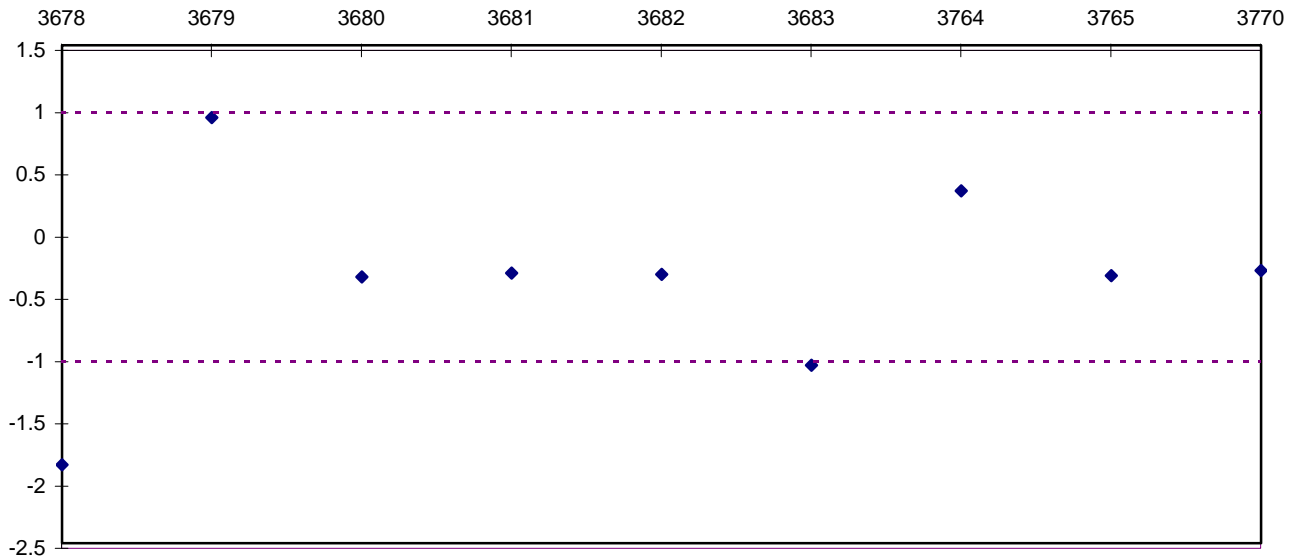
## Measurement Points

NAPT-RGSP-101

Nominal Value: 100 inch

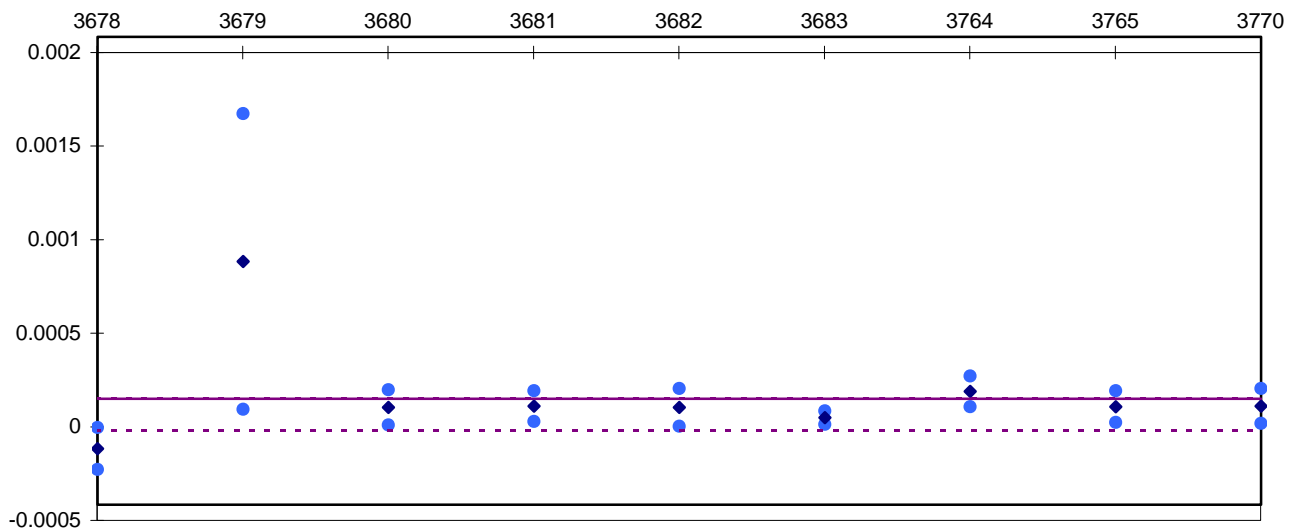
Upper Righth Corner

Computed En Values



$$En = (\text{Lab Mean} - \text{STD Value}) / (\text{SQRT}(\text{Lab Uncert}^2 + \text{STD Uncert}^2))$$

Meas Value and Uncert.  
Std Value and Uncert. - Horz. Lines



Means - Low Value: Mean - Uncertainty // Middle Value: Mean // High Value: Mean + Uncertainty

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## ILC/PT DATA: NAPT-RGSP-101

### Group Comparisons

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#### MEASUREMENT DESCRIPTION: Dimensional Lower Right Corner

NOMINAL VALUE:	30 inch	MEAN VALUE (Satisfactory Results):	0.000036
REFERENCE VALUE:	0.000043	MEAN VALUE (All Results):	0.000058
REFERENCE UNCERTAINTY:	0.000088		

Date Of Final Report: August 01, 2005

<i>Test #</i>	<i>Reported Value</i>	<i>Reported Uncertainty</i>	<i>En</i>	<i>S/U</i>	<i>IWO</i>
3678	-0.000140	0.00011	-1.29	U	W
3679	0.000150	0.00079	0.13	S	W
3680	0.000000	0.000094	-0.33	S	I
3681	0.000023	0.000082	-0.17	S	I
3682	0.000140	0.0001	0.72	S	W
3683	-0.000005	0.000036	-0.51	S	I
3764	0.000028	0.000082	-0.12	S	I
3765	0.000070	0.000084	0.22	S	I
3770	0.000058	0.000093	0.12	S	I



# PROFICIENCY TEST DATA (Continuation)

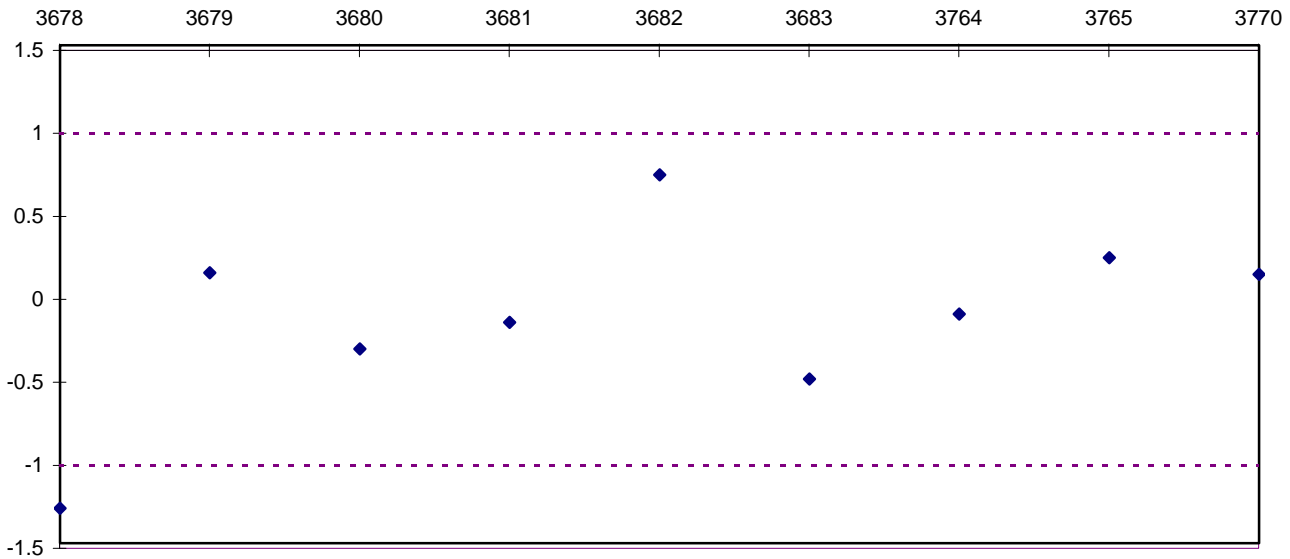
## Measurement Points

NAPT-RGSP-101

Nominal Value: 30 inch

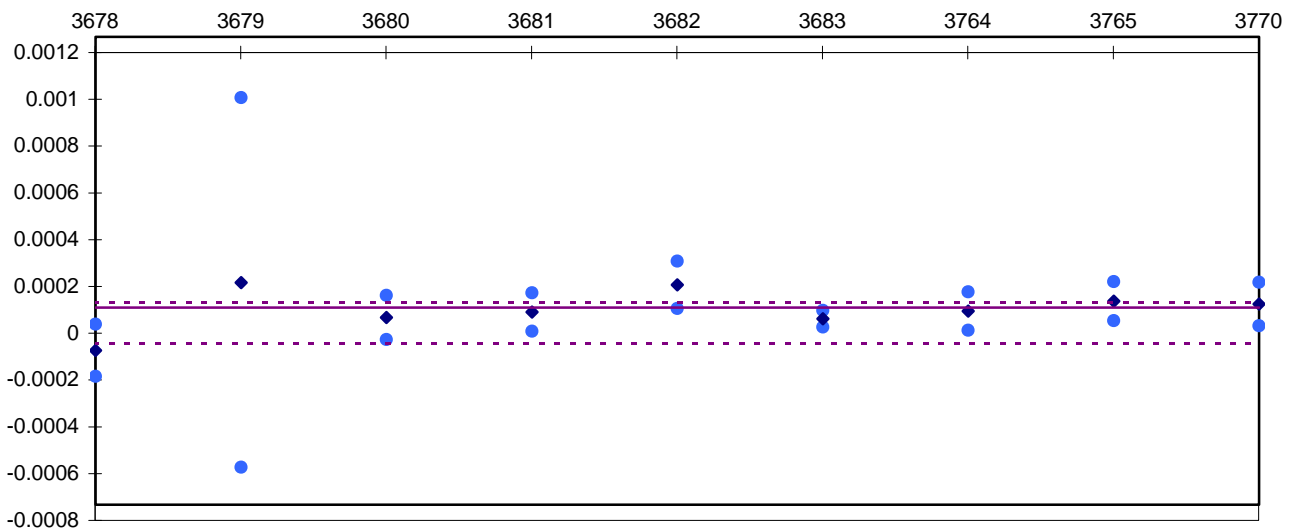
Lower Right Corner

Computed En Values



$$En = (\text{Lab Mean} - \text{STD Value}) / (\text{SQRT}(\text{Lab Uncert}^2 + \text{STD Uncert}^2))$$

Meas Value and Uncert.  
Std Value and Uncert. - Horz. Lines



Means - Low Value: Mean - Uncertainty // Middle Value: Mean // High Value: Mean + Uncertainty

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# PROFICIENCY TEST DATA (Continuation)

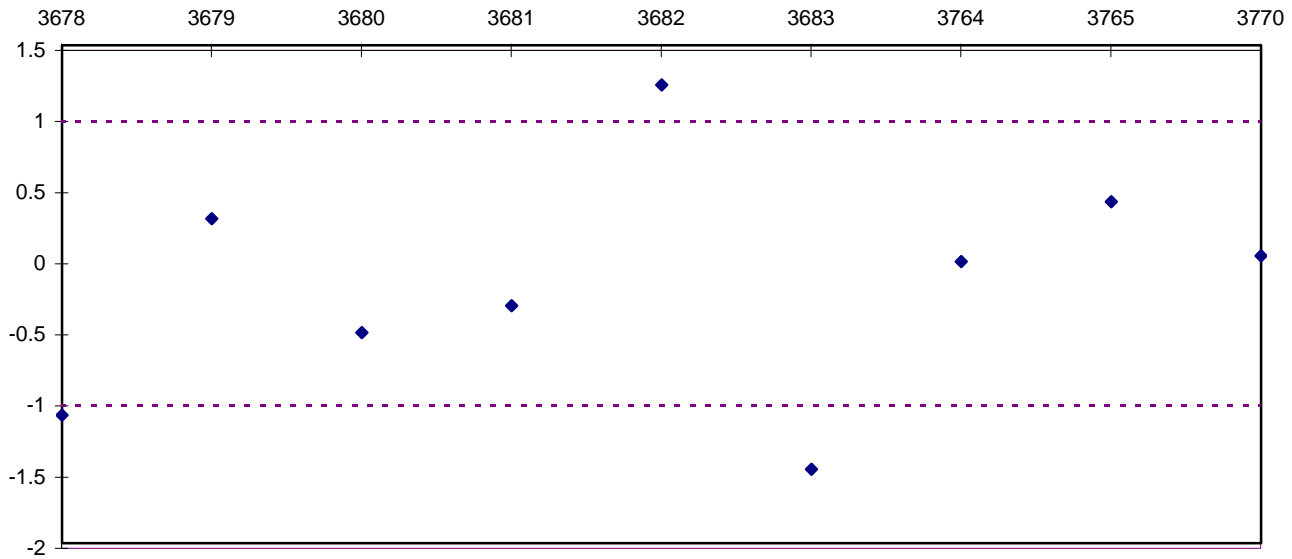
## Measurement Points

NAPT-RGSP-101

Nominal Value: 75 inch

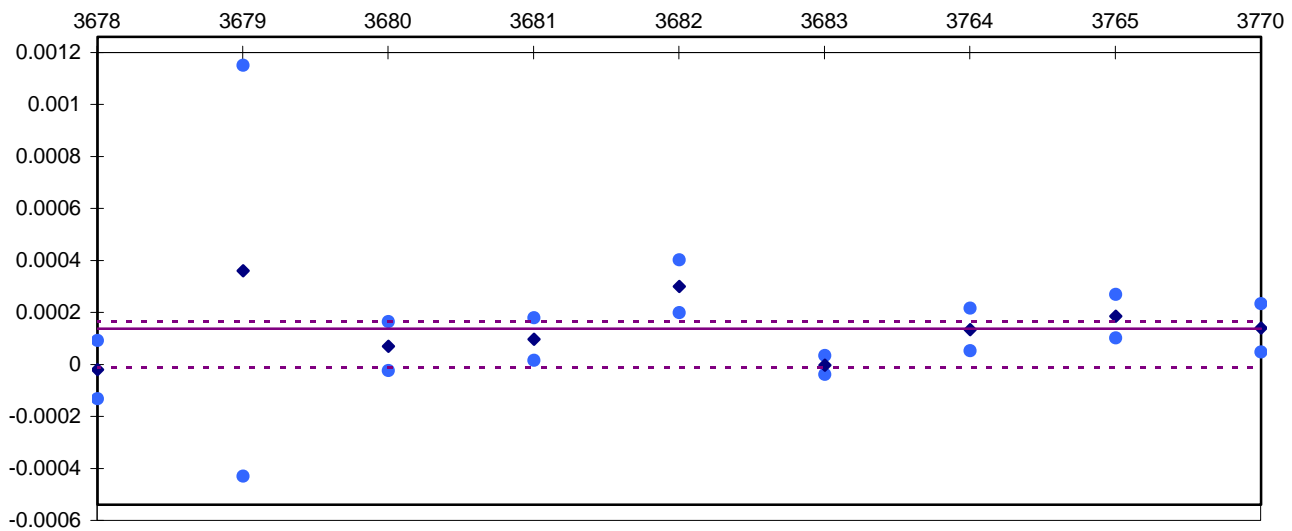
Upper Left Corner

Computed En Values



$$En = (\text{Lab Mean} - \text{STD Value}) / (\text{SQRT}(\text{Lab Uncert}^2 + \text{STD Uncert}^2))$$

Meas Value and Uncert.  
Std Value and Uncert. - Horz. Lines



Means - Low Value: Mean - Uncertainty // Middle Value: Mean // High Value: Mean + Uncertainty



# PROFICIENCY TEST DATA (Continuation)

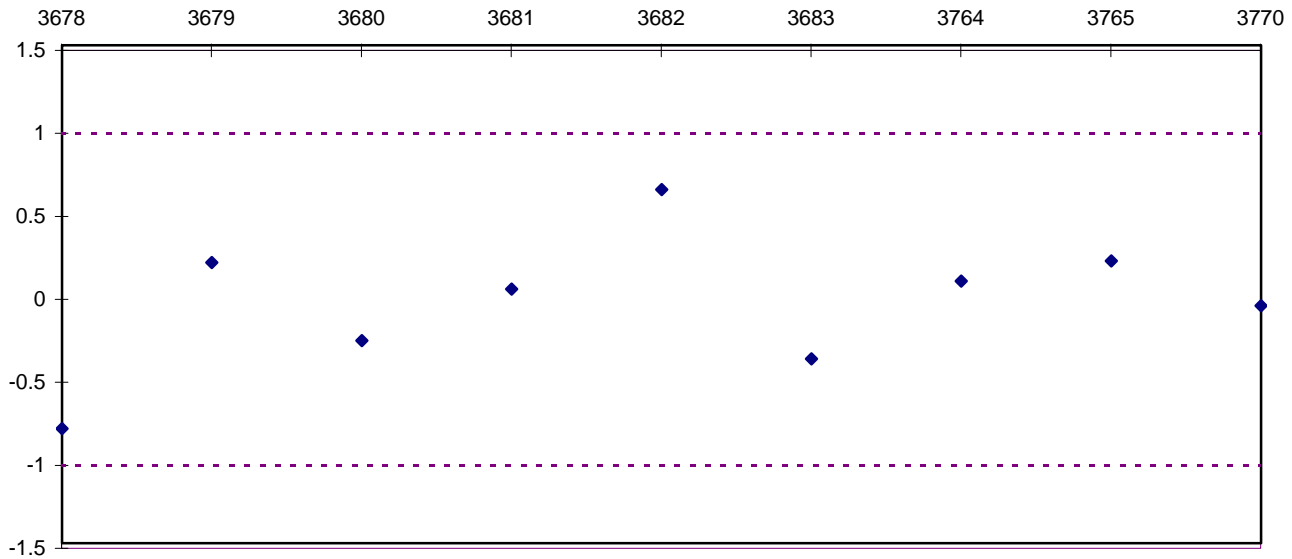
## Measurement Points

NAPT-RGSP-101

Nominal Value: 25 inch

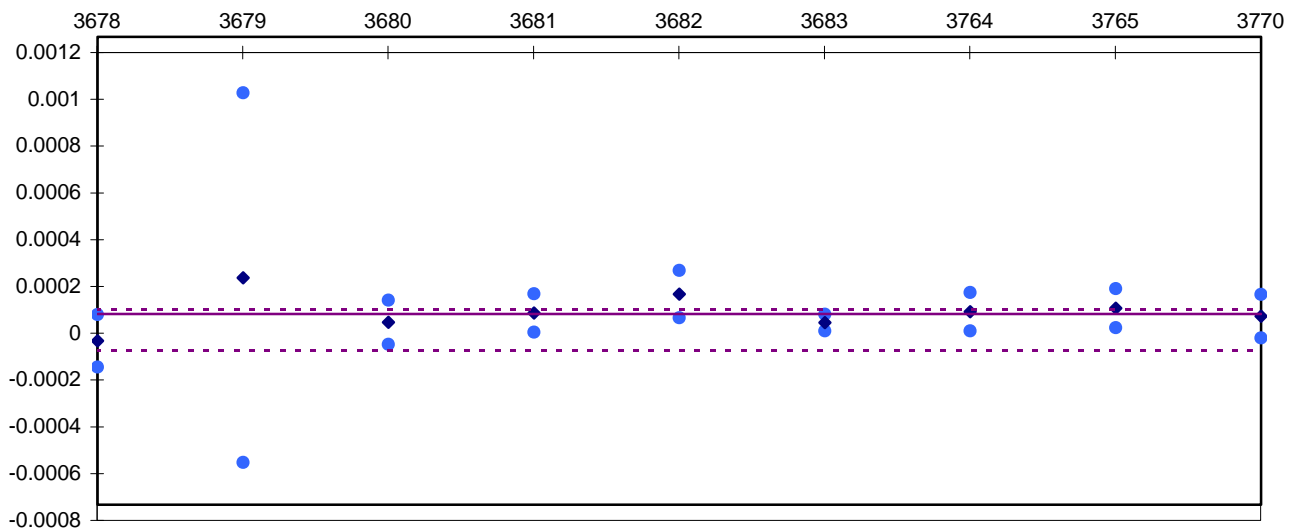
Middle Left

Computed En Values



$$En = (\text{Lab Mean} - \text{STD Value}) / (\text{SQRT}(\text{Lab Uncert}^2 + \text{STD Uncert}^2))$$

Meas Value and Uncert.  
Std Value and Uncert. - Horz. Lines



Means - Low Value: Mean - Uncertainty // Middle Value: Mean // High Value: Mean + Uncertainty



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## ILC/PT DATA: NAPT-RGSP-101

### Group Comparisons

This section of the report presents comparisons of the performance of all participants against each other and against reference data for each nominal set point. Data is shown in both tabular and graphical format.

#### MEASUREMENT DESCRIPTION: Dimensional Middle Right

**NOMINAL VALUE:** 100 inch      **MEAN VALUE (Satisfactory Results):** 0.000090  
**REFERENCE VALUE:** 0.000072      **MEAN VALUE (All Results):** 0.000121  
**REFERENCE UNCERTAINTY:** 0.000088

Date Of Final Report: August 01, 2005

<i>Test #</i>	<i>Reported Value</i>	<i>Reported Uncertainty</i>	<i>En</i>	<i>S/U</i>	<i>IWO</i>
3678	-0.000160	0.00011	-1.63	U	O
3679	0.000700	0.00079	0.79	S	W
3680	0.000020	0.000094	-0.4	S	I
3681	0.000037	0.000082	-0.29	S	I
3682	0.000040	0.0001	-0.24	S	I
3683	-0.000003	0.000036	-0.79	S	I
3764	0.000106	0.000082	0.28	S	I
3765	0.000030	0.000084	-0.35	S	I
3770	0.000038	0.000093	-0.27	S	I

# PROFICIENCY TEST DATA (Continuation)

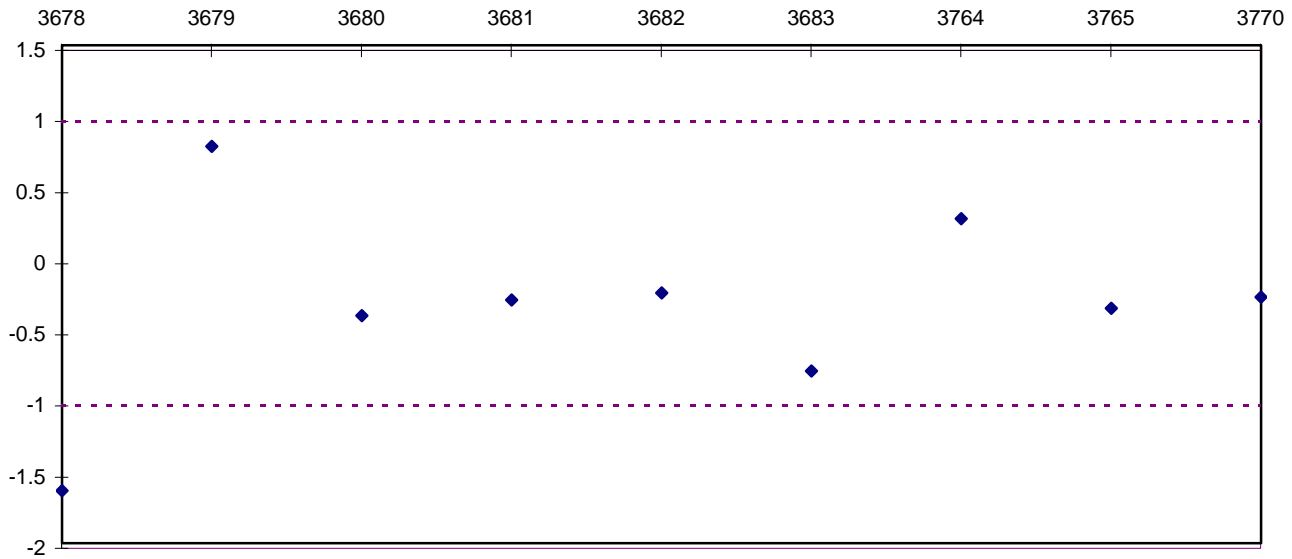
## Measurement Points

NAPT-RGSP-101

Nominal Value: 100 inch

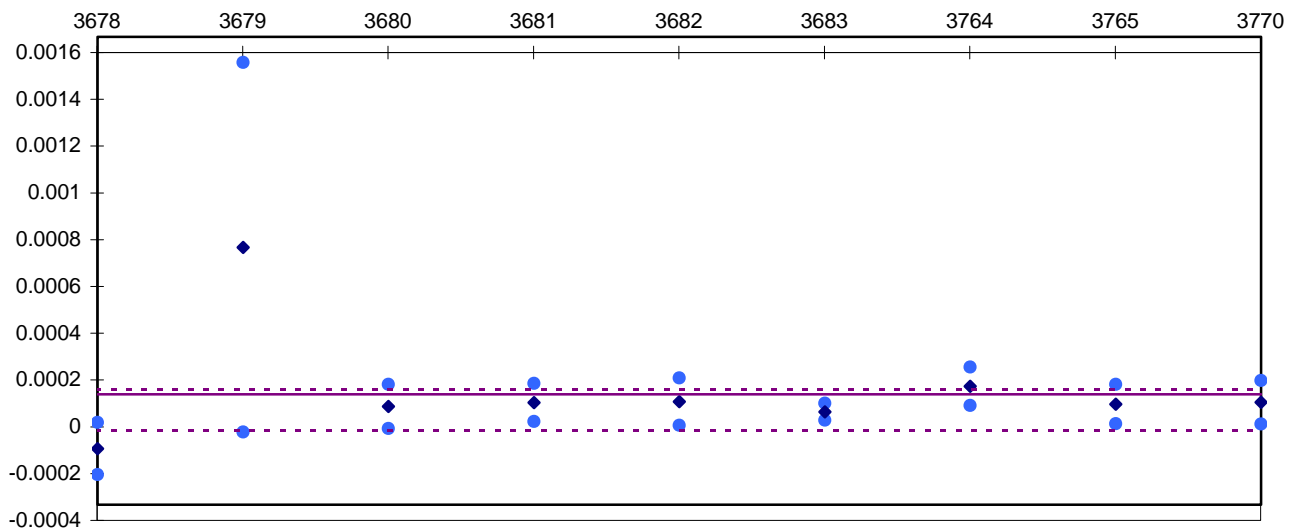
Middle Right

Computed En Values



$$En = (\text{Lab Mean} - \text{STD Value}) / (\text{SQRT}(\text{Lab Uncert}^2 + \text{STD Uncert}^2))$$

Meas Value and Uncert.  
Std Value and Uncert. - Horz. Lines



Means - Low Value: Mean - Uncertainty // Middle Value: Mean // High Value: Mean + Uncertainty

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## ILC/PT DATA: NAPT-RGSP-101

### Group Comparisons

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#### MEASUREMENT DESCRIPTION: Dimensional Lower Center

**NOMINAL VALUE:** 100 inch      **MEAN VALUE (Satisfactory Results):** 0.000088  
**REFERENCE VALUE:** 0.000065      **MEAN VALUE (All Results):** 0.000088  
**REFERENCE UNCERTAINTY:** 0.000088

Date Of Final Report: August 01, 2005

<i>Test #</i>	<i>Reported Value</i>	<i>Reported Uncertainty</i>	<i>En</i>	<i>S/U</i>	<i>IWO</i>
3678	-0.000020	0.00011	-0.6	S	I
3679	0.000600	0.00079	0.67	S	W
3680	0.000020	0.000094	-0.35	S	I
3681	-0.000011	0.000082	-0.63	S	I
3682	0.000060	0.0001	-0.04	S	I
3683	-0.000010	0.000036	-0.79	S	I
3764	0.000106	0.000082	0.34	S	I
3765	0.000025	0.000084	-0.33	S	I
3770	0.000024	0.000093	-0.32	S	I



# PROFICIENCY TEST DATA (Continuation)

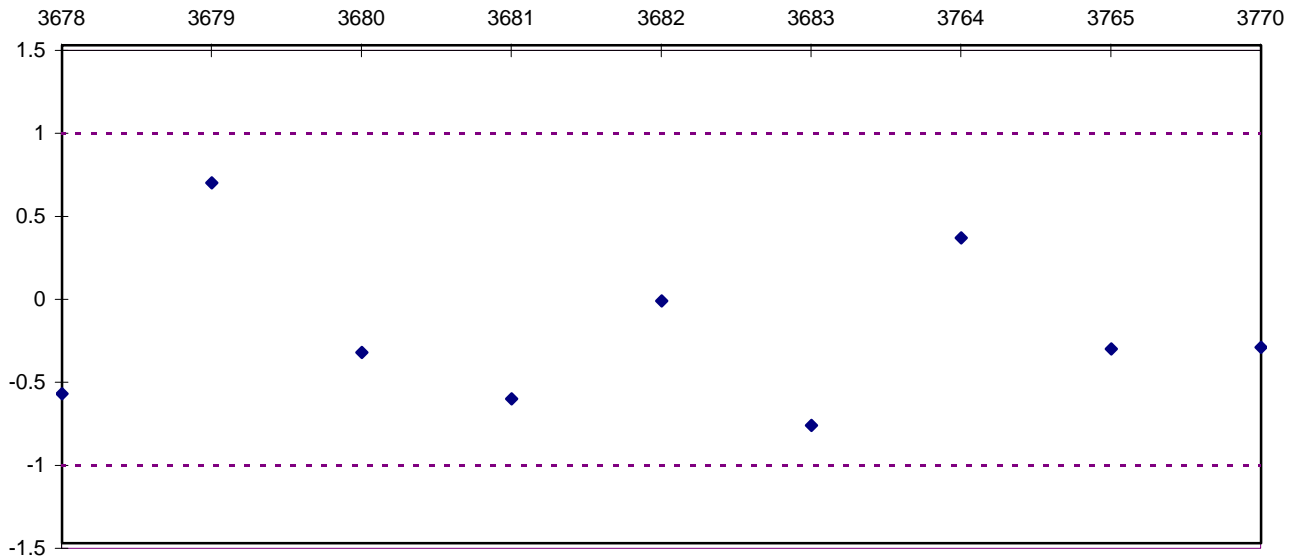
## Measurement Points

NAPT-RGSP-101

Nominal Value: 100 inch

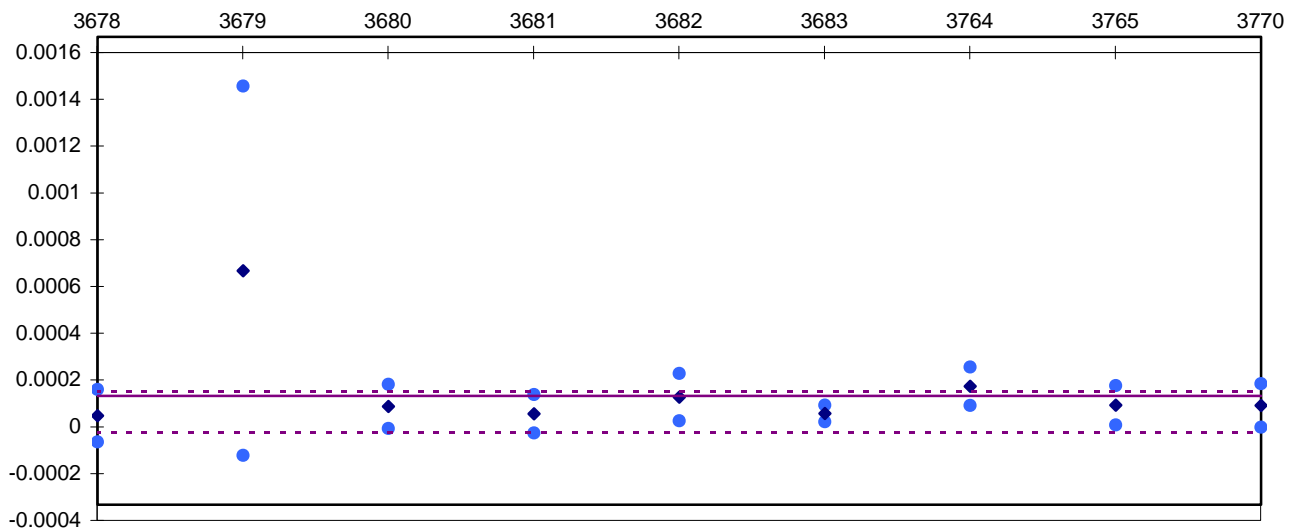
Lower Center

Computed En Values



$$En = (\text{Lab Mean} - \text{STD Value}) / (\text{SQRT}(\text{Lab Uncert}^2 + \text{STD Uncert}^2))$$

Meas Value and Uncert.  
Std Value and Uncert. - Horz. Lines



Means - Low Value: Mean - Uncertainty // Middle Value: Mean // High Value: Mean + Uncertainty

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## ILC/PT DATA: NAPT-RGSP-101

### Group Comparisons

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#### MEASUREMENT DESCRIPTION: Dimensional Upper Center

NOMINAL VALUE:	140 inch	MEAN VALUE (Satisfactory Results):	0.000078
REFERENCE VALUE:	0.000063	MEAN VALUE (All Results):	0.000078
REFERENCE UNCERTAINTY:	0.000088		

Date Of Final Report: August 01, 2005

<i>Test #</i>	<i>Reported Value</i>	<i>Reported Uncertainty</i>	<i>En</i>	<i>S/U</i>	<i>IWO</i>
3678	-0.000020	0.00011	-0.58	S	I
3679	0.000400	0.00079	0.42	S	W
3680	0.000000	0.000094	-0.49	S	I
3681	0.000080	0.000082	0.14	S	I
3682	0.000040	0.0001	-0.17	S	I
3683	0.000030	0.000036	-0.35	S	I
3764	0.000088	0.000082	0.21	S	I
3765	0.000050	0.000084	-0.11	S	I
3770	0.000038	0.000093	-0.2	S	I

# PROFICIENCY TEST DATA (Continuation)

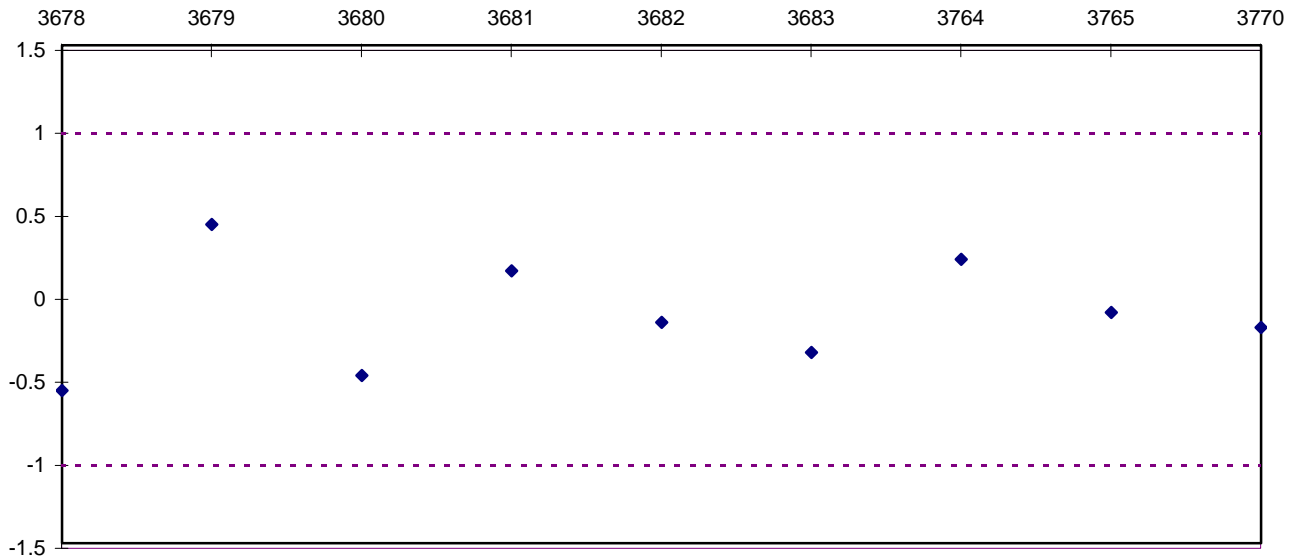
## Measurement Points

NAPT-RGSP-101

Nominal Value: 140 inch

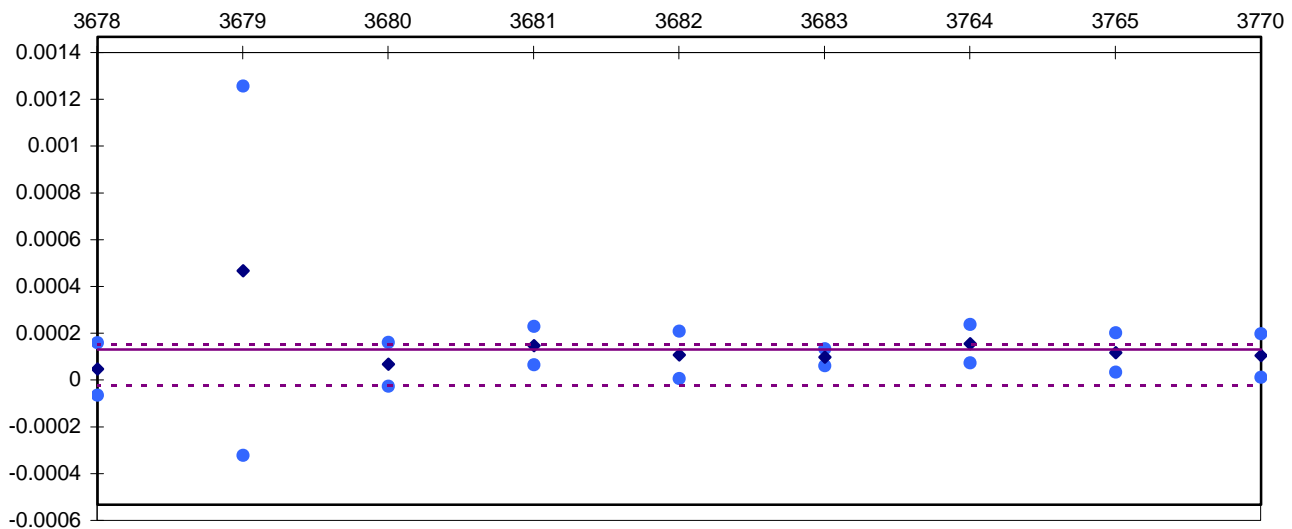
Upper Center

Computed En Values



$$En = (\text{Lab Mean} - \text{STD Value}) / (\text{SQRT}(\text{Lab Uncert}^2 + \text{STD Uncert}^2))$$

Meas Value and Uncert.  
Std Value and Uncert. - Horz. Lines



Means - Low Value: Mean - Uncertainty // Middle Value: Mean // High Value: Mean + Uncertainty

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## ILC/PT DATA: NAPT-RGSP-101

### Group Comparisons

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#### MEASUREMENT DESCRIPTION: Dimensional Overall Flatness

NOMINAL VALUE:	150 inch	MEAN VALUE (Satisfactory Results):	0.000227
REFERENCE VALUE:	0.000239	MEAN VALUE (All Results):	0.000254
REFERENCE UNCERTAINTY:	0.000088		

Date Of Final Report: August 01, 2005

<i>Test #</i>	<i>Reported Value</i>	<i>Reported Uncertainty</i>	<i>En</i>	<i>S/U</i>	<i>IWO</i>
3678	0.000170	0.00011	-0.48	S	I
3679	0.000300	0.00079	0.08	S	I
3680	0.000040	0.000094	-1.54	U	O
3681	0.000262	0.000082	0.2	S	I
3682	0.000240	0.0001	0.01	S	I
3683	0.000329	0.000036	0.95	S	W
3764	0.000223	0.000082	-0.13	S	I
3770	0.000254	0.000094	0.12	S	I

# PROFICIENCY TEST DATA (Continuation)

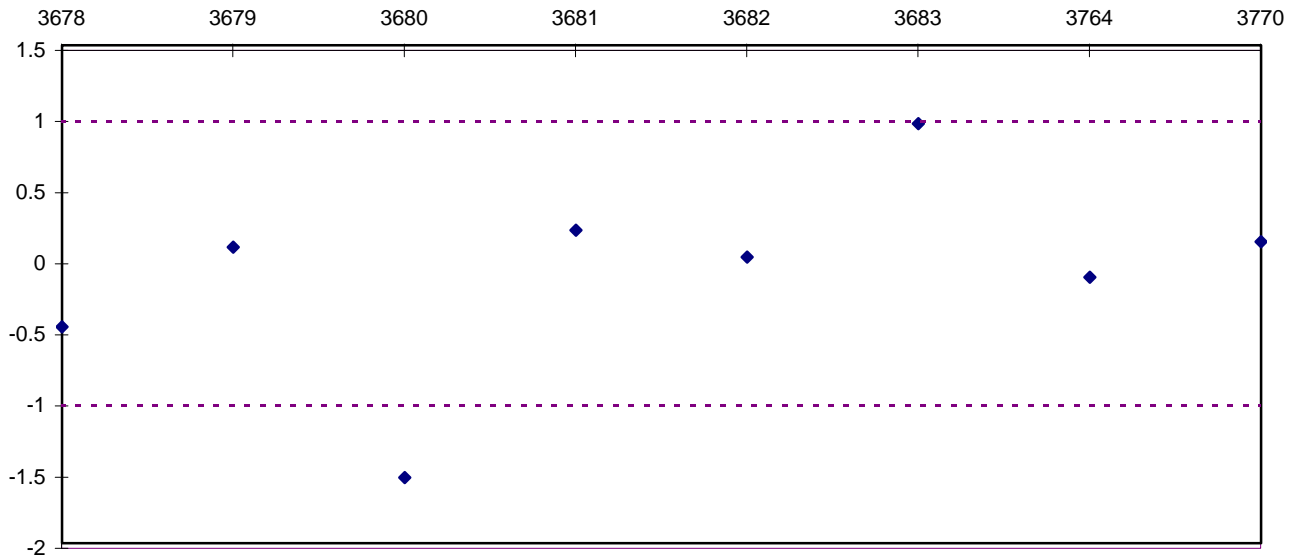
## Measurement Points

NAPT-RGSP-101

Nominal Value: 150 inch

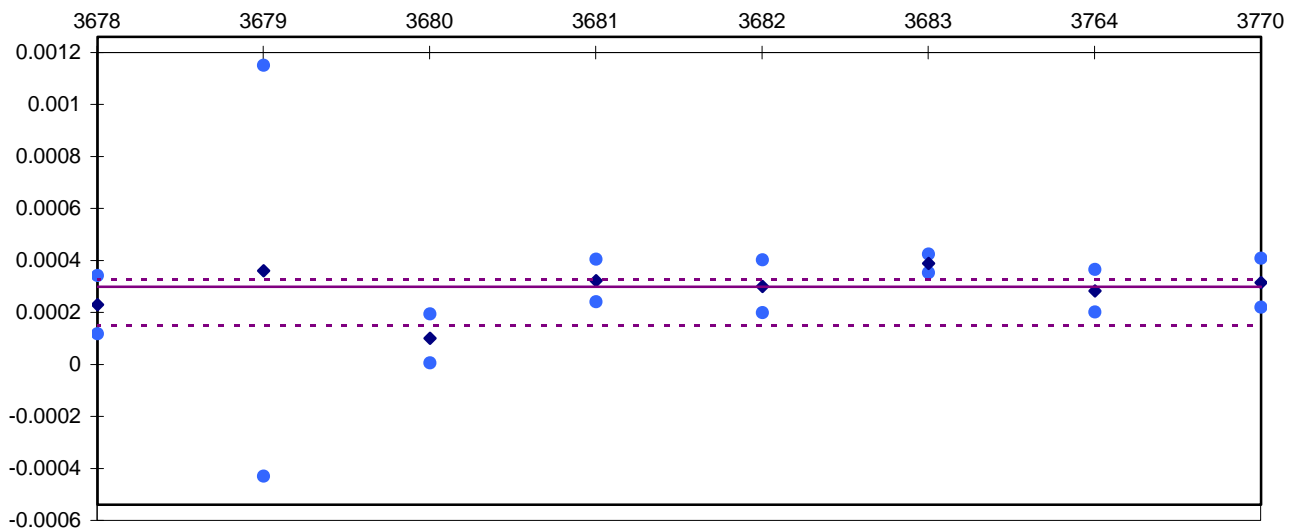
Overall Flatness

Computed En Values



$$En = (\text{Lab Mean} - \text{STD Value}) / (\text{SQRT}(\text{Lab Uncert}^2 + \text{STD Uncert}^2))$$

Meas Value and Uncert.  
Std Value and Uncert. - Horz. Lines



Means - Low Value: Mean - Uncertainty // Middle Value: Mean // High Value: Mean + Uncertainty

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