

# ILC/PT Preliminary Report

Hand Tool Set / NAPT-IMC-401

Date of Issue: 04/13/2009

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## *National Association for Proficiency Testing*

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This report documents the preliminary results for the ILC/PT listed above, including data presented by Digital Measurement Metrology to NAPT for evaluation.

The ILC/PT consisted of 16 set points. Your organization submitted results for 16 of which 16 had  $E_n$  values greater than -1 and less than 1. Most accreditation bodies require the  $E_n$  value to be between -1 and 1 to be considered a satisfactory performance in an ILC/PT.

Because this is only the Preliminary Report, reference values and uncertainties are subject to change between issuance of the Preliminary Report and the Final Report. The changes are based on accepted methods for determination of reference data. These requirements are defined in the NAPT Quality Procedure 304-1 "Data and Statistical Analysis Procedure".

In this preliminary evaluation, your reported values are compared against **initial established reference values only**. Please refer to NAPT's supplemental guide to interpretation of reports for in-depth guidance on reports issued by NAPT, available for download at [www.proficiency.org](http://www.proficiency.org)

The main purpose of the preliminary report is to provide a means by which to share the data your organization initially submitted to NAPT. Participants are given 10 days to inform NAPT of any errors reported in the data. If changes need to be made to the submittal, NAPT will need to verify all re-submitted data and require objective evidence be submitted before any modifications can be made to the original data. Objective evidence may include original observations, data collection sheets, uncertainty budgets, procedures used and other pertinent documentation.

Please contact NAPT with any questions regarding this Preliminary Report.

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**Organization Participating**  
**Reported To:**  
**Performed By:**  
**Date of Participation:**

Digital Measurement Metrology  
Raj Sharma  
Raj Sharma  
04/09/2009



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## ILC/PT PRELIMINARY REPORT

Hand Tool Set/NAPT-IMC-401  
Digital Measurement Metrology

Report Date: 04/13/2009  
Date of Participation in ILC/PT: 04/09/2009

All artifacts used in this ILC/PT are commercially available instruments, chosen based on their ability to provide the wide characterization and spectrum needed. A description of the artifacts utilized in this ILC is listed below.

Model	Serial Number	Attribute	Manufacturer
293-761-30	122710	Micrometer	Mitutoyo
599-571	9R008406	Caliper	Brown & Sharpe
6090010	9R09802	Micrometer	Brown & Sharpe
6V3075	SP6IS	Dial Indicator	Federal

During the course of each ILC/PT, NAPT's Technical Director and the Technical Advisor(s) assigned to the ILC/PT conduct comprehensive technical reviews. Data analyses are conducted before, during, and after the artifacts are put into distribution. This is done to assure test integrity and look for trends or anomalies in the data.

Only after a careful review of all the data does NAPT assign an established reference value. To prematurely assign a reference value could be inaccurate and may result in a value that would not pass a robust analysis. Doing so would not ensure confidence in the reference value assigned.

Making an assumption that a single measurement is the correct measurement is not a technically sound process for ensuring the validity of the data in any ILC/PT, after all, no single laboratory is infallible. That is why only after a thorough technical review, will NAPT assign a reference value to an ILC/PT.

Likewise, if you suspect or question any of the preliminary data do not hesitate to contact us.

The Final Report will also include a detailed comparison to the results reported by other participants in this ILC/PT and a graphical presentation of all results submitted. Participants can choose an abridged final report. In the abridged version no graphs are presented.

All NAPT programs are conducted in accordance with ISO/IEC Guide 43-1 and ILAC-G13:2000 requirements for proficiency testing providers.

**Table Descriptors:** *Following bullets are meant to assist reader of this report in reviewing table.*

- Values are rounded to the resolution of the reference data. Rounding does not affect the data analysis and is for reporting purposes only
- All uncertainties are at (or normalized to)  $K=2$  (coverage factor associated with a 2-sigma, 95%, normal distribution)
- $E_n = (\text{Participant's Reported Value} - \text{Reference Value}) / \text{SQRT}(\text{Participant's Reported Uncertainty}^2 + \text{Reference Uncertainty}^2)$
- S (Satisfactory): Participant's Computed  $E_n$  is within range of +1 to -1
- U (Unsatisfactory): Participant's Computed  $E_n$  is outside range of +1 to -1
- I (In Range): Participant's Reported Value falls within established reference uncertainty
- W (Within Range): Participant's Reported Value and associated uncertainty overlaps the reference uncertainty.
- O (Out of Range): The Participant's Reported Value and associated uncertainty falls outside the uncertainty limits of the established Reference Value. No agreement in measurements



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## PRELIMINARY REPORT: PARTICIPANT DATA

Hand Tool Set/NAPT-IMC-401  
Digital Measurement Metrology

Report Date: 04/13/2009  
Date of Participation in ILC/PT: 04/09/2009

Preliminary analysis of the data, Digital Measurement Metrology, submitted to NAPT is shown below.

### Individual performance indicators include:

- Your measurement data at each set point
- Preliminary established reference values and uncertainties of artifact(s)
- Preliminary Participant's  $E_n$  values, S/U (satisfactory/unsatisfactory) and IWO (in/within/out of range) rating
- Established reference values and uncertainties are subject to change between issuance of the Preliminary and Final Report, changes are based on accepted methods for determination of established reference values

Measurement Description	Reported Value / Reference Value	Reported Uncertainty / Reference Uncertainty	$E_n$	S/U	IWO
1) Dial Indicator 2.54 mm	2.54 / 2.54	0.006 / 0.01	-0.03	S	I
2) Dial Indicator 3.25 mm	3.25 / 3.25	0.006 / 0.01	-0.23	S	I
3) Dial Indicator 7.62 mm	7.63 / 7.63	0.006 / 0.01	0.51	S	I
4) Dial Indicator 14.00 mm	14.01 / 14.00	0.006 / 0.01	0.57	S	I
5) Caliper - Inside Diameter 1.1140 in	1.1140 / 1.1140	0.00070 / 0.0005	0.00	S	I
6) Caliper - Inside Diameter 1.9685 in	1.9685 / 1.9685	0.00070 / 0.0005	0.00	S	I
7) Caliper - Inside Diameter 4.0375 in	4.0375 / 4.0375	0.00070 / 0.0005	0.00	S	I
8) Caliper - Depth 3.0000 in	3.0000 / 3.0002	0.00070 / 0.0005	-0.20	S	I
9) B&S Micrometer 0.2445 in	0.24460 / 0.24454	0.000067 / 0.00008	0.63	S	I
10) B&S Micrometer 0.3508 in	0.35085 / 0.35082	0.000067 / 0.00008	0.31	S	I
11) B&S Micrometer 0.7150 in	0.71505 / 0.71503	0.000068 / 0.00008	0.21	S	I
12) B&S Micrometer 0.8500 in	0.85000 / 0.85002	0.000067 / 0.00008	-0.21	S	I
13) Mitutoyo Micrometer 0.2445 in	0.24450 / 0.24451	0.000068 / 0.00008	-0.06	S	I
14) Mitutoyo Micrometer 0.3508 in	0.35080 / 0.35081	0.000068 / 0.00008	-0.06	S	I
15) Mitutoyo Micrometer 0.7150 in	0.71505 / 0.71501	0.000067 / 0.00008	0.41	S	I
16) Mitutoyo Micrometer 0.8500 in	0.85005 / 0.85002	0.000067 / 0.00008	0.30	S	I