

DUBAI ACCREDITATION DEPARTMENT

REPORT ON PTP 211TH INTER-LABORATORY PROFICIENCY TESTING PROGRAM DETERMINATION OF WET SIEVE ANALYSIS IN SOIL

Date: 16 August 2011

1. INTRODUCTION

This document presents the results of the 211th inter-laboratory proficiency-testing program conducted during the month of July involving the determination of **Wet Sieve Analysis in Soil** with thirty seven laboratories participating.

This program is part of the Inter-laboratory Comparison Programs organized by Dubai Accreditation Department (DAC) of Dubai Municipality (DM) for monitoring the validity of test results of laboratories operating in Dubai as a requirement of the Law No.2/2010 and ISO/IEC 17011: 2004.

2. EXPERIMENTAL DESIGN

2.1 Homogeneity:

DAC had ensured the homogeneity of the samples prior to their distribution to the participating laboratories by conducting homogeneity test on six samples (randomly selected), two portions A & B from each sample were tested. Based on the test results the homogeneity is statistically evaluated as per *ISO 13528:2005 as explained in DAC-G3-03*.

2.2 Participants:

Thirty seven laboratories were participated in this PTP including:

Twenty seven laboratories were participated in this PTP including:

- Two are governmental laboratories.
- Twenty two are private laboratories operating in Dubai including accredited and registered laboratories.
- Six private laboratories are from other Emirates.
- Four laboratories are from Qatar.
- Two laboratories are from Oman
- One laboratory is from Bahrain.

2.3 Samples Tested:

One Soil sample of approximately 2 kg consists of fine sand specimen was distributed to all participating laboratories. With each participant being given one sample with a unique identification number provided during the time of collection.

3. CONFIDENTIALITY

Each laboratory is given a code number to maintain confidentiality of results and to protect their identities. Only the concerned laboratory knows its code number.

4. TEST METHOD

- ##### 4.1
- Instructions were given to the participants to test the samples for Determination of wet sieve analysis as per (BS 1377 PART 2:1990 T 9.2 AMD9027:1996).



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- 4.2. Test Sieves to be used: 5 mm, 3.35 mm, 2 mm, 1.18, 0.600 mm, 0.425 mm, 0.300 mm, 0.212 mm, 0.150 mm, 0.063 mm.

5. TEST RESULTS

The test results submitted by the participating laboratories are presented in Appendix A. In order to protect the identity of the participating laboratories, each one was assigned a code number. The numbers in the column headings, Lab #, of the tables represents the code numbers for the participating laboratories.

6. EVALUATION OF RESULTS

6.1 Method of Analysis

The analysis of the participant's results is based on *ISO 13528:2005 (Statistical Methods for the Use in Proficiency Testing by Inter-laboratory Comparisons)*.

6.2 Calculations of Z- Scores

Appendix B gives the details of the calculation of the laboratories results and their Z-Scores which are obtained from the raw data appendix A. Also Z- Score and participant's results are represented in a bar chart and X-Y scattered plots C. The Z-Score analysis is based on an international Standard (*ISO 13528:2005*).

6.3 Outlier Results

Test	Labs outside the z-scores ± 3
Sieve Analysis (0.300 mm)	Lab2; Lab4; Lab21; Lab EX20
Sieve Analysis (0.063 mm)	Lab EX16

After evaluating the Z-Score the test results provided by the above mentioned laboratories are outside the Z - score limits of ± 3 , the above mentioned laboratories are requested to investigate the root cause of the outlier results, implement corrective action and a report shall be available for checking by assessment team during the nearest assessment visit.

Also other participating laboratories have showed Z-score values higher than **two** which is **not outlier** but a warning limit, these laboratories are advised to investigate the potential root cause of such results.

7. APPENDICES

- 7.1 Appendix A: Raw Data
7.2 Appendix B: Calculation of z-scores and other statistics
7.3 Appendix C: Charts

---- End of Report ----

Determination of Wet Sieve Analysis in Soil

Appendix A:

Table - 1		(0.300 mm)	(0.150 mm)	(0.063 mm)
Lab Code #	Sample No.	Results	Results	Results
Lab G01	21101	99	75	2
Lab EX20		99.2	74	0.5
Lab EX25	21155	99	77	1
Lab39	21103	99	77	1
Lab4	21104	100	78	1
Lab EX9	21154	99	76	2
Lab56	21105	99	78	1
Lab21	21107	100	75	1
Lab7	21108	99	78	1
Lab EX8	21153	99	78	1
Lab9	21110	99	77	1
Lab28	21111	99	78	2
Lab23	21113	99	77	1
Lab EX6	21152	99	77	2
Lab EX16		99	72	0
Lab2	21102	100	79	1
Lab57	21114	99	75	1
Lab58	21109	99	76	1
Lab EX14		99	76	1
Lab64	21116	99	75	1
Lab EX24		99	74	1
Lab66	21119	99	77	1
Lab72	21120	99	72	2
Lab67	21121	99	78	2
Lab71	21122	99	77	1
Lab74	21123	99	75	1
Lab EX2		99	78	1
Lab79		99	76	2
Lab82	21126	99	75	1
Lab84	21127	99	77	1
Lab EX10	21134	99	76	1
Lab89	21128	99	76	2
Lab EX4		99	74	1
Lab35	21145	99	77	1
Lab EX11	21129	99	78	1
Lab EX17	21131	99	76	1
Lab EX18	21138	99	76	1

Table - 1 (0.300 mm)

Iteration	0		1		2		3		4		5		6		Z Score
$\delta = 1.5 s^*$	---	xi-x*	0.42	(xi-x*) ²	0.20	(xi-x*) ²	0.12	(xi-x*) ²	0.08	(xi-x*) ²	0.05	(xi-x*) ²	0.03	(xi-x*) ²	
$x^* - \delta$	---		98.58		98.84		98.90		98.94		98.96		98.97		
$x^* + \delta$	---		99.42		99.24		99.15		99.10		99.06		99.04		
Lab EX10	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX11	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX14	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX16	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX17	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX18	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX2	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX24	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX25	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX4	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX6	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX8	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX9	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab G01	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab23	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab28	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab35	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab39	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab56	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab57	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab58	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab64	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab66	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab67	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab7	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab71	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab72	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab74	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab79	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab82	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab84	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab89	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab9	99	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	99.00	0.00	-0.30
Lab EX20	99.2	0.20	99.20	0.03	99.20	0.03	99.15	0.02	99.10	0.01	99.06	0.00	99.04	0.00	13.86
Lab2	100	1.00	99.42	0.14	99.24	0.05	99.15	0.02	99.10	0.01	99.06	0.00	99.04	0.00	70.53
Lab21	100	1.00	99.42	0.14	99.24	0.05	99.15	0.02	99.10	0.01	99.06	0.00	99.04	0.00	70.53
Lab4	100	1.00	99.42	0.14	99.24	0.05	99.15	0.02	99.10	0.01	99.06	0.00	99.04	0.00	70.53
Average	99.09		99.04	0.50	99.02	0.19	99.02	0.08	99.01	0.03	99.01	0.01	99.00	0.01	
SD	0.28		0.12	0.01	0.07	0.01	0.05	0.00	0.03	0.00	0.02	0.00	0.01	0.00	
New x*	99	0.00	99.04	0.12	99.02	0.07	99.02	0.05	99.01	0.03	99.01	0.02	99.00	0.01	
New s*	0.28		0.13		0.08		0.05		0.03		0.02		0.01	0.11	

N 37

Target value	99.00
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Low Acceptable	98.96
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High Acceptable	99.05
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Acceptable Range	98.96 - 99.05
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Table - 2 (0.150 mm)

Iteration	0		1		2		3		4		5		6		Z Score
$\delta = 1.5 s^*$	---	xi-x*	2.22	(xi-x*) ²	2.38	(xi-x*) ²	2.36	(xi-x*) ²	2.36	(xi-x*) ²	2.28	(xi-x*) ²	2.25	(xi-x*) ²	
$x^* - \delta$	---		73.78		73.91		73.94		73.94		74.02		74.05		
$x^* + \delta$	---		78.22		78.68		78.66		78.66		78.58		78.56		
Lab EX16	72	4.00	73.78	6.33	73.91	5.72	73.94	5.59	73.94	5.56	74.02	5.23	74.05	5.09	-2.90
Lab72	72	4.00	73.78	6.33	73.91	5.72	73.94	5.59	73.94	5.56	74.02	5.23	74.05	5.09	-2.90
Lab EX20	74	2.00	74.00	5.25	74.00	5.28	74.00	5.29	74.00	5.29	74.02	5.23	74.05	5.09	-1.56
Lab EX24	74	2.00	74.00	5.25	74.00	5.28	74.00	5.29	74.00	5.29	74.02	5.23	74.05	5.09	-1.56
Lab EX4	74	2.00	74.00	5.25	74.00	5.28	74.00	5.29	74.00	5.29	74.02	5.23	74.05	5.09	-1.56
Lab G01	75	1.00	75.00	1.67	75.00	1.69	75.00	1.69	75.00	1.69	75.00	1.71	75.00	1.72	-0.88
Lab21	75	1.00	75.00	1.67	75.00	1.69	75.00	1.69	75.00	1.69	75.00	1.71	75.00	1.72	-0.88
Lab57	75	1.00	75.00	1.67	75.00	1.69	75.00	1.69	75.00	1.69	75.00	1.71	75.00	1.72	-0.88
Lab64	75	1.00	75.00	1.67	75.00	1.69	75.00	1.69	75.00	1.69	75.00	1.71	75.00	1.72	-0.88
Lab74	75	1.00	75.00	1.67	75.00	1.69	75.00	1.69	75.00	1.69	75.00	1.71	75.00	1.72	-0.88
Lab82	75	1.00	75.00	1.67	75.00	1.69	75.00	1.69	75.00	1.69	75.00	1.71	75.00	1.72	-0.88
Lab EX10	76	0.00	76.00	0.08	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.10	-0.21
Lab EX14	76	0.00	76.00	0.08	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.10	-0.21
Lab EX17	76	0.00	76.00	0.08	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.10	-0.21
Lab EX18	76	0.00	76.00	0.08	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.10	-0.21
Lab EX9	76	0.00	76.00	0.08	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.10	-0.21
Lab58	76	0.00	76.00	0.08	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.10	-0.21
Lab79	76	0.00	76.00	0.08	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.10	-0.21
Lab89	76	0.00	76.00	0.08	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.09	76.00	0.10	-0.21
Lab EX25	77	1.00	77.00	0.50	77.00	0.49	77.00	0.49	77.00	0.49	77.00	0.48	77.00	0.48	0.46
Lab EX6	77	1.00	77.00	0.50	77.00	0.49	77.00	0.49	77.00	0.49	77.00	0.48	77.00	0.48	0.46
Lab23	77	1.00	77.00	0.50	77.00	0.49	77.00	0.49	77.00	0.49	77.00	0.48	77.00	0.48	0.46
Lab35	77	1.00	77.00	0.50	77.00	0.49	77.00	0.49	77.00	0.49	77.00	0.48	77.00	0.48	0.46
Lab39	77	1.00	77.00	0.50	77.00	0.49	77.00	0.49	77.00	0.49	77.00	0.48	77.00	0.48	0.46
Lab66	77	1.00	77.00	0.50	77.00	0.49	77.00	0.49	77.00	0.49	77.00	0.48	77.00	0.48	0.46
Lab71	77	1.00	77.00	0.50	77.00	0.49	77.00	0.49	77.00	0.49	77.00	0.48	77.00	0.48	0.46
Lab84	77	1.00	77.00	0.50	77.00	0.49	77.00	0.49	77.00	0.49	77.00	0.48	77.00	0.48	0.46
Lab9	77	1.00	77.00	0.50	77.00	0.49	77.00	0.49	77.00	0.49	77.00	0.48	77.00	0.48	0.46
Lab EX11	78	2.00	78.00	2.92	78.00	2.90	78.00	2.89	78.00	2.89	78.00	2.87	78.00	2.85	1.14
Lab EX2	78	2.00	78.00	2.92	78.00	2.90	78.00	2.89	78.00	2.89	78.00	2.87	78.00	2.85	1.14
Lab EX8	78	2.00	78.00	2.92	78.00	2.90	78.00	2.89	78.00	2.89	78.00	2.87	78.00	2.85	1.14
Lab28	78	2.00	78.00	2.92	78.00	2.90	78.00	2.89	78.00	2.89	78.00	2.87	78.00	2.85	1.14
Lab4	78	2.00	78.00	2.92	78.00	2.90	78.00	2.89	78.00	2.89	78.00	2.87	78.00	2.85	1.14
Lab56	78	2.00	78.00	2.92	78.00	2.90	78.00	2.89	78.00	2.89	78.00	2.87	78.00	2.85	1.14
Lab67	78	2.00	78.00	2.92	78.00	2.90	78.00	2.89	78.00	2.89	78.00	2.87	78.00	2.85	1.14
Lab7	78	2.00	78.00	2.92	78.00	2.90	78.00	2.89	78.00	2.89	78.00	2.87	78.00	2.85	1.14
Lab2	79	3.00	78.22	3.74	78.22	3.71	78.22	3.70	78.22	3.70	78.22	3.68	78.22	3.66	1.81
Average	76.22		76.29	70.71	76.30	69.41	76.30	69.14	76.30	69.08	76.31	68.13	76.31	67.32	
SD	1.65		1.40	1.96	1.39	1.93	1.39	1.92	1.39	1.80	1.38	1.75	1.37	1.71	
New x*	76	1.00	76.291	1.40	76.298	1.39	76.300	1.39	76.300	1.34	76.31	1.32	76.31	1.31	
New s*	1.48		1.589		1.575		1.572		1.522		1.501		1.48		

N	37
Target value	76.31

Low Acceptable	71.86
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High Acceptable	80.76
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Acceptable Range	71.86 - 80.76
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Table - 3 (0.063 mm)

Iteration	0		1		2		3		4		5		6		Z Score
$\delta = 1.5 s^*$	---	xi-x*	0.71	(xi-x*) ²	0.59	(xi-x*) ²	0.55	(xi-x*) ²	0.53	(xi-x*) ²	0.51	(xi-x*) ²	0.49	(xi-x*) ²	
x* - δ	---		0.29		0.54		0.57		0.59		0.61		0.62		
x* + δ	---		1.71		1.71		1.68		1.66		1.63		1.61		
Lab EX16	0	1.00	0.29	0.69	0.54	0.35	0.57	0.30	0.59	0.28	0.61	0.26	0.62	0.24	-3.54
Lab EX20	0.5	0.50	0.50	0.39	0.54	0.35	0.57	0.30	0.59	0.28	0.61	0.26	0.62	0.24	-1.94
Lab EX10	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab EX11	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab EX14	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab EX17	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab EX18	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab EX2	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab EX24	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab EX25	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab EX4	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab EX8	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab2	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab21	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab23	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab35	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab39	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab4	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab56	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab57	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab58	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab64	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab66	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab7	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab71	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab74	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab82	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab84	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab9	1	0.00	1.00	0.01	1.00	0.02	1.00	0.02	1.00	0.01	1.00	0.01	1.00	0.01	-0.35
Lab EX6	2	1.00	1.71	0.35	1.71	0.34	1.68	0.31	1.66	0.29	1.63	0.27	1.61	0.24	2.83
Lab EX9	2	1.00	1.71	0.35	1.71	0.34	1.68	0.31	1.66	0.29	1.63	0.27	1.61	0.24	2.83
Lab G01	2	1.00	1.71	0.35	1.71	0.34	1.68	0.31	1.66	0.29	1.63	0.27	1.61	0.24	2.83
Lab28	2	1.00	1.71	0.35	1.71	0.34	1.68	0.31	1.66	0.29	1.63	0.27	1.61	0.24	2.83
Lab67	2	1.00	1.71	0.35	1.71	0.34	1.68	0.31	1.66	0.29	1.63	0.27	1.61	0.24	2.83
Lab72	2	1.00	1.71	0.35	1.71	0.34	1.68	0.31	1.66	0.29	1.63	0.27	1.61	0.24	2.83
Lab79	2	1.00	1.71	0.35	1.71	0.34	1.68	0.31	1.66	0.29	1.63	0.27	1.61	0.24	2.83
Lab89	2	1.00	1.71	0.35	1.71	0.34	1.68	0.31	1.66	0.29	1.63	0.27	1.61	0.24	2.83
Average	1.18		1.12	4.27	1.13	3.82	1.12	3.51	1.12	3.24	1.12	2.99	1.11	2.76	
SD	0.47		0.34	0.12	0.33	0.11	0.31	0.10	0.30	0.09	0.29	0.08	0.28	0.08	
New x*	1	0.00	1.12	0.34	1.13	0.33	1.12	0.31	1.12	0.30	1.12	0.29	1.11	0.28	
New s*	0.47		0.39		0.37		0.35		0.34		0.33		0.31		

N 37

Target value	1.11
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Low Acceptable	0.17
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High Acceptable	2.05
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Acceptable Range	0.17 - 2.05
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