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TESTING PROVIDER SERVICES

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PJLA
Proficiency Testing
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Accreditation #118302

PROFICIENCY TESTING ON CONSTRUCTION MATERIALS

PT Scheme: JPTPS/P11

Program No. : JPTPS/P11-015
PT Report No.. : JPTPS/P11-015-200325
Issue Date. : March 20, 2025
Status. : Final PTP report for Liquid Limit, Plastic Limit and Plasticity Index of Soil

Approved By:

Jacob Joy
Managing Director

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PROFICIENCY TESTING REPORT	F/OPN/04, Issue 01, Rev.02

Proficiency testing scheme for	**Soil**
Programme No.	**JPTPS/P11-015**
Report No.	**JPTPS/P11-015-200325**
Date of Issue	**20th March 2025**
Status	**Final PTP report for Liquid Limit, Plastic Limit and Plasticity Index of Soil (JPTPS/P11-015-200325)**
Proficiency test item	**Soil**
Test Parameters	**Liquid Limit, Plastic Limit, Plasticity Index**
Testing Reference standard	**BS EN ISO 17892-12:2018+A1:2021**
Design and execution of proficiency testing scheme	**As per protocol**
Contact details of PT Co–ordinator	**Ms. Shaira Mae Talisay** **E mail → tm@jacobptp.com** **Cell No. → +02 555 3232 / 056 990 7435**

Introduction

This document presents the results of the **JPTPS/P11-015** proficiency testing program conducted during the month of **February 10, 2025 to March 10, 2025** involving the **Liquid Limit, Plastic Limit and Plasticity Index of Soil** as per **BS EN ISO 17892-12:2018+A1:2021.**

Proficiency testing program has become an essential aspect of laboratory practice in all areas of testing, calibration and inspection.

This report is approved by Managing Director based on the review of report by experts as the outcome of meeting for the technical content.
If this report is use it must be the complete report.
This report doesn't mean indorsement of the laboratory.
Participant whose test results are identified as an outlier has the right to appeal.

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Objective of Inter laboratory testing

Proficiency testing by interlaboratory comparison is used to determine the performance of individual laboratories for specific tests or measurements, and to monitor the continuing performance of laboratories. Participation in proficiency testing schemes provides laboratory with an objective means of assuring and demonstrating the reliability of the data they are producing, where one of the main uses of proficiency testing schemes is to asses laboratories ability to perform test competently. Statically, the majority of the results will be centered on a mean value, with some results lies at the extremes of the distribution. The statistics of a normal distribution mean that 95% of data points will lie between a z–score of –2 and +2.

Homogeneity

JPTPS had ensured the homogeneity of the samples prior to their distribution to the participating laboratories by segregation of sample after conducting the test on the large sample and then it was divided in to 50 equal parts to make homogeneous sample. Homogeneity was conducted on test on ten samples (randomly selected). Based on the test results the homogeneity is statistically evaluated as per ISO 13528:2022.

For conducting the checks on homogeneity of the sample, the accredited testing laboratories were used as a reference laboratory

Confidentiality

All laboratories are given unique code number and that code number will be fixed through–out the proficiency testing scheme. The Laboratory only knows, his code no. Analyzed data, laboratory results sheet, laboratory name, and feedback are made strictly confidential. However, it may be disclosed to PJLA / Accreditation body, if required. It is also made available to PJLA Assessor during our assessment by PJLA.

Samples Tested

1 bag, 500 g of Soil <425 µm samples have been distributed to all laboratory and they have tested the samples and submitted the results of the samples on time.

Test Method

Instructions were given to all participant to test the samples of Soil as per BS EN ISO 17892-12:2018+A1:2021 detail protocol was submitted to the participant along with samples for step-by-step follow–up.

Test Results

The test results submitted by participating laboratories are presented in Appendix A. In order to protect the identity of the participating laboratories, they were assigned a code number.

The numbers in the column headings, Lab ID No., of the tables represents the code numbers for the participating laboratories. Participant laboratories have conducted the tests as required in the relevant standard and reported average result for each sample (based on the numbers of test conducted by them on single sample).

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Abu Dhabi | Dubai | Sharjah | Bahrain | Qatar | Kuwait

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All such information was reported in the result sheet. Result sheet and raw data sheet were verified upon receipt for typographical error, if any as well as compliance with the requirements given in the relevant protocol.

Analysis of Results

Test results received from all participant laboratories are evaluated as per ISO/IEC 17043:2010 and ISO 13528:2022. Evaluation is done by calculation of robust average and standard deviation as per ISO 13528:2022, for each test parameter Robust 'Z' score is calculated = (x–x*)/s*

Where, x is the participants result, x* is robust average and s* is robust standard deviation.

Calculations of Z Scores and En Scores

Appendix B gives the details of the statistical analysis of the laboratories results and estimation of their Z–Scores and E_n which are obtained from the raw data. Z–Score and E_n for each participant is represented in a bar chart, and also the result of each participant laboratory is plotted as X–Y scattered plots to compare with target value and acceptable ranges which are statistically estimated.

Also, participant's Z–Scores are plotted as X–Y scattered plots to compare with ± 3 as acceptable limit and ± 2 as warning limit in Appendix B. The Z–Score and En-Score analysis is based on an international Standard (ISO 13528:2022)

Outlier Results

Test parameters	Labs having questionable z–scores > 2	Labs having z–scores outside ± 3	Labs having $\lvert E_n \rvert$ outside > 1.00
Liquid Limit	E-165	None	E-165
Plastic Limit	None	None	E-047, E-054
Plasticity Index	None	None	E-163, E-165

		Color Coding
IZI ≤ 2	=	Satisfactory
2 < IZI < 3	=	Questionable
IZI ≥ 3	=	Unsatisfactory
No score given	=	For qualitative results, where satisfactory performance is based on the participants reporting the same result as the assigned result. E.g. present, absent. For these results, colour coding of green (**Pass**) or red (**Fail**) will apply.
$\lvert E_n \rvert$ < 1.00	=	Satisfactory
$\lvert E_n \rvert$ ≥ 1.00	=	Unsatisfactory

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After evaluating the Z–Score and En score, the test results provided by the above-mentioned laboratory was questionable with the Z–score limits > 2 and outside with En ≥ 1. The above-mentioned laboratory is requested to investigate the root cause of the outlier results, select and implement an appropriate corrective action to improve the performance of the laboratory during their next participation and to improve the measurement uncertainty.

Metrological traceability and measurement uncertainty of assigned value

Metrological traceability

- Metrological traceability was established by ensuring accreditation of participants by ENAS as per ISO/IEC 17025.

Measurement Uncertainty

- Measurement uncertainty is calculated for the parameters as below;

$$E_n=(X_{lab}-X_{ref})/\sqrt{(U^2_{lab}+U^2_{ref})}$$

where;

X_{lab} = Measurement result of participating laboratory

X_{ref}= Measurement result of reference laboratory

U_{lab} = The 95 % uncertainty of participating laboratory

U_{ref} = The 95 % uncertainty of reference laboratory

APPENDICES

Appendix A: Raw Data

Appendix B: Summary Results & Charts

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Appendix A: Raw Data

PT Scheme	JPTPS/P11-015					
Test Method Used	BS EN ISO 17892-12:2018+A1:2021					
Lab ID No.	Liquid Limit	Uncertainty	Plastic Limit	Uncertainty	Plasticity Index	Uncertainty
	%		%		%	
E-005	49	-	31	-	18	-
E-023	52	1.63	30	1.62	22	1.58
E-029	51	1.27	29	0.86	22	1.29
E-045	50	1.54	29	1.65	21	1.59
E-047	51	1.10	31	1.84	20	1.52
E-050	51	1.20	29	0.89	22	1.29
E-054	50	1.74	31	1.95	19	1.95
E-098	51	1.62	29	1.62	22	1.62
E-099	51	1.31	30	1.51	21	1.51
E-108	50	-	32	-	18	-
E-143	52	1.64	30	1.41	22	1.80
E-146	50	1.35	30	1.12	20	1.62
E-163	50	1.01	28	0.94	22	1.12
E-164	52	-	30	-	22	-
E-165	48	1.79	30	1.94	18	1.81

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Appendix B: Summary Results & Charts

PT Scheme: JPTPS/P11-015
Test Method Used: BS EN ISO 17892-12:2018+A1:2021
Parameter: Liquid Limit
Unit: %

Lab ID	Result	Uncertainty	Z score	EN-Score
E-005	49	-	1.41	-
E-023	52	1.63	1.24	0.84
E-029	51	1.27	0.36	0.31
E-045	50	1.54	0.52	0.37
E-047	51	1.10	0.36	0.35
E-050	51	1.20	0.36	0.32
E-054	50	1.74	0.52	0.33
E-098	51	1.62	0.36	0.25
E-099	51	1.31	0.36	0.30
E-108	50	-	0.52	-
E-143	52	1.64	1.24	0.84
E-146	50	1.35	0.52	0.42
E-163	50	1.01	0.52	0.55
E-164	52	-	1.24	-
E-165	48	1.79	2.29	1.42

	Value
Number of Results	15
Mean	51 %
Median	51 %
Standard Deviation	1.087 %

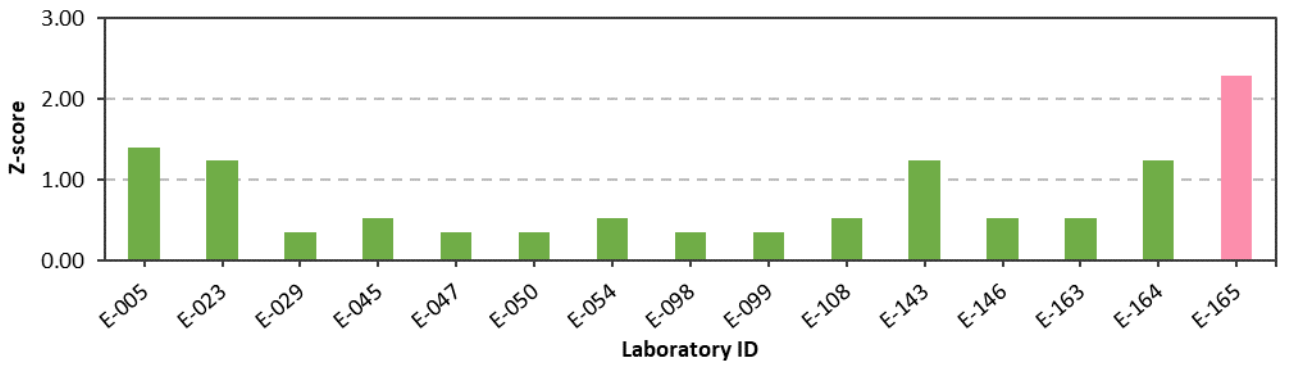
Assigned Value	51 %
Uncertainty of Assigned Value	0.37 %
SDPA	1.132 %
Satisfactory Range	47 - 54 %
Satisfactory Z scores	93.3 %
Questionable Z scores	6.7 %
Unsatisfactory Z Scores	0.0 %
Satisfactory En Scores	91.7 %
Unsatisfactory En Scores	8.3 %

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Mart Dandy Mejia	Jacob Joy	
PT Co-ordinator	Managing Director	

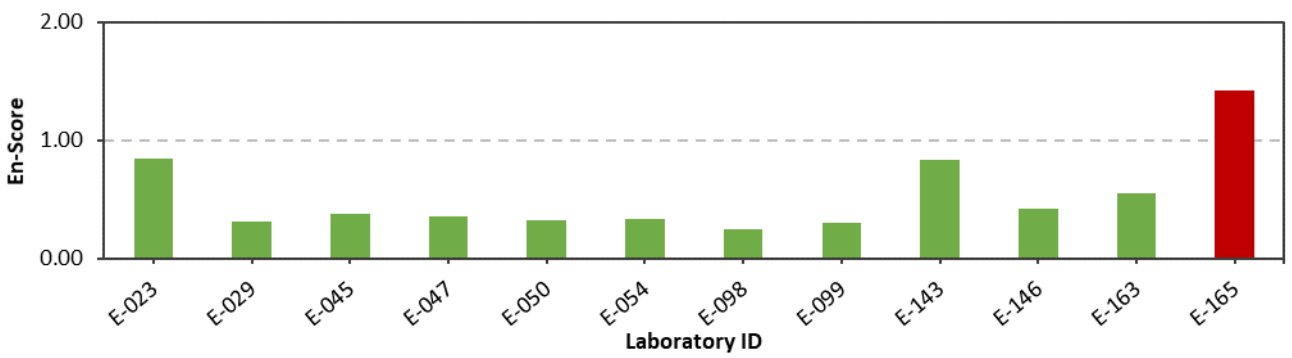
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PT Scheme: JPTPS/P11-015
Test Method Used: BS EN ISO 17892-12:2018+A1:2021
Parameter: Liquid Limit
Unit: %

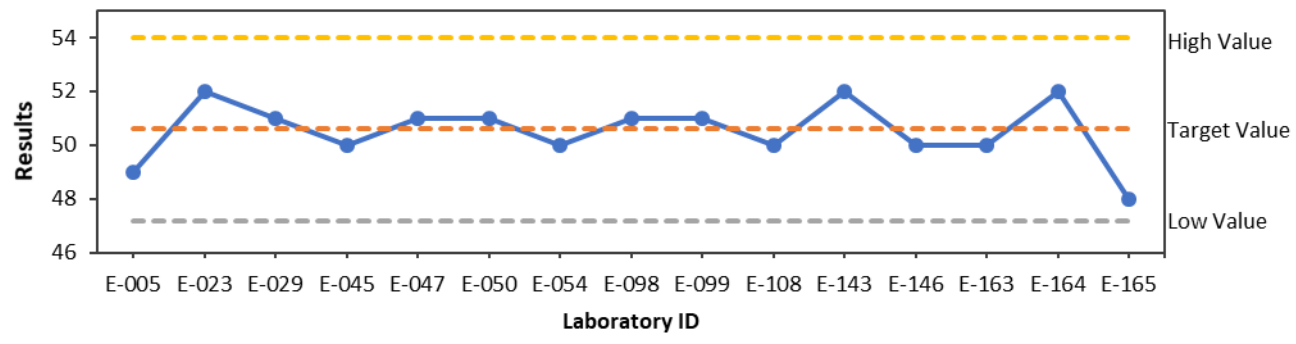
Z score value of the Laboratories Results



En score value of the Laboratories Results



Comparison between Lab Results, Target Value, Low and High Value



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PT Scheme: JPTPS/P11-015
Test Method Used: BS EN ISO 17892-12:2018+A1:2021
Parameter: Plastic Limit
Unit: %

Lab ID	Result	Uncertainty	Z score	EN-Score
E-005	31		1.03	
E-023	30	1.62	0.07	0.05
E-029	29	0.86	0.89	1.00
E-045	29	1.65	0.89	0.55
E-047	31	1.84	1.03	0.58
E-050	29	0.89	0.89	0.97
E-054	31	1.95	1.03	0.54
E-098	29	1.62	0.89	0.56
E-099	30	1.51	0.07	0.05
E-108	32		1.99	
E-143	30	1.41	0.07	0.05
E-146	30	1.12	0.07	0.07
E-163	28	0.94	1.85	1.93
E-164	30		0.07	
E-165	30	1.94	0.07	0.04

	Value
Number of Results	15
Mean	30 %
Median	30 %
Standard Deviation	0.998 %

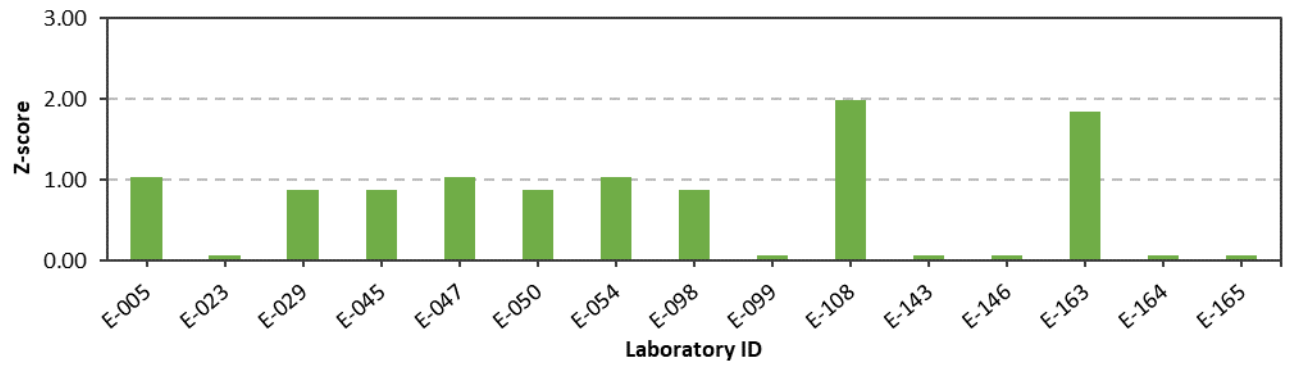
Assigned Value	30 %
Uncertainty of Assigned Value	0.34 %
SDPA	1.041 %
Satisfactory Range	27 - 33 %
Satisfactory Z scores	100.0 %
Questionable Z scores	0.0 %
Unsatisfactory Z Scores	0.0 %
Satisfactory En Scores	91.7 %
Unsatisfactory En Scores	8.3 %

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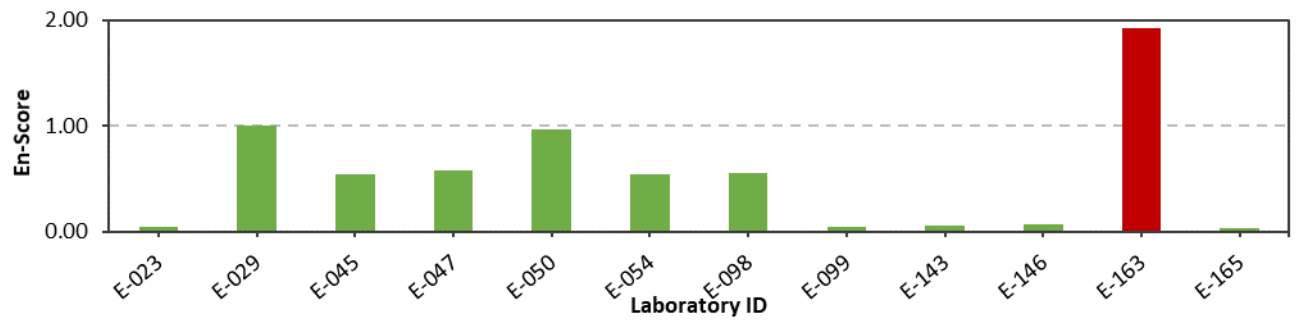
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PT Scheme: JPTPS/P11-015
Test Method Used: BS EN ISO 17892-12:2018+A1:2021
Parameter: Plastic Limit
Unit: %

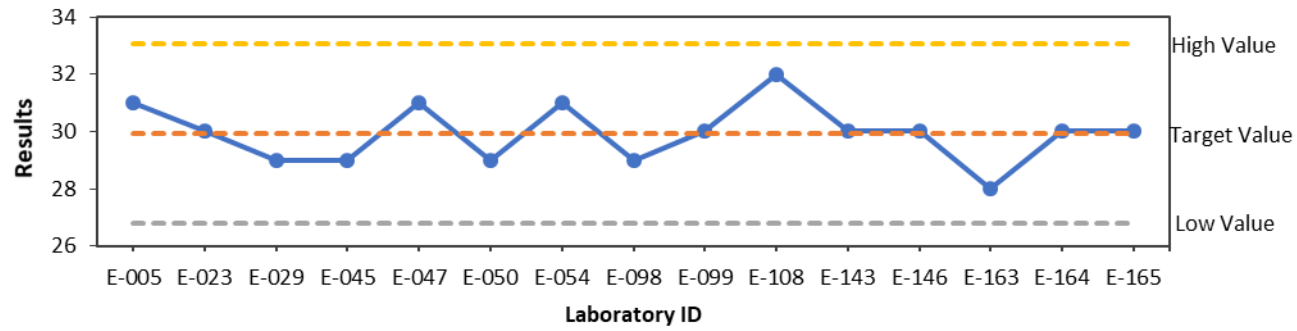
Z score value of the Laboratories Results



En score value of the Laboratories Results



Comparison between Lab Results, Target Value, Low and High Value



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Test Method Used: BS EN ISO 17892-12:2018+A1:2021
Parameter: Plasticity Index
Unit: %

Lab ID	Result	Uncertainty	Z score	EN-Score
E-005	18		1.40	
E-023	22	1.58	0.75	0.83
E-029	22	1.29	0.75	0.98
E-045	21	1.59	0.22	0.24
E-047	20	1.52	0.32	0.37
E-050	22	1.29	0.75	0.98
E-054	19	1.95	0.86	0.78
E-098	22	1.62	0.75	0.81
E-099	21	1.51	0.22	0.25
E-108	18		1.40	
E-143	22	1.80	0.75	0.74
E-146	20	1.62	0.32	0.35
E-163	22	1.12	0.75	1.10
E-164	22		0.75	
E-165	18	1.81	1.40	1.36

	Value
Number of Results	15
Mean	21 %
Median	21 %
Standard Deviation	1.583 %

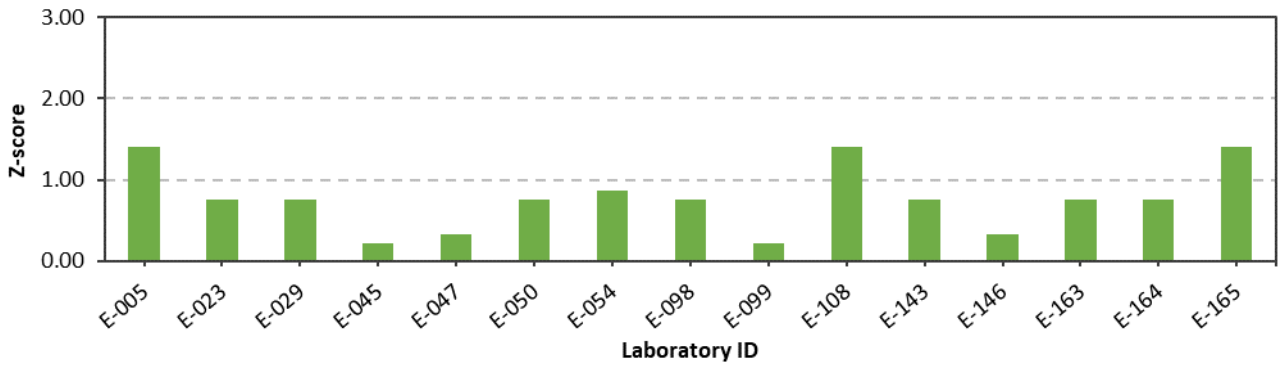
Assigned Value	21 %
Uncertainty of Assigned Value	0.60 %
SDPA	1.858 %
Satisfactory Range	15 - 26 %
Satisfactory Z scores	100.0 %
Questionable Z scores	0.0 %
Unsatisfactory Z Scores	0.0 %
Satisfactory En Scores	83.3 %
Unsatisfactory En Scores	16.7 %

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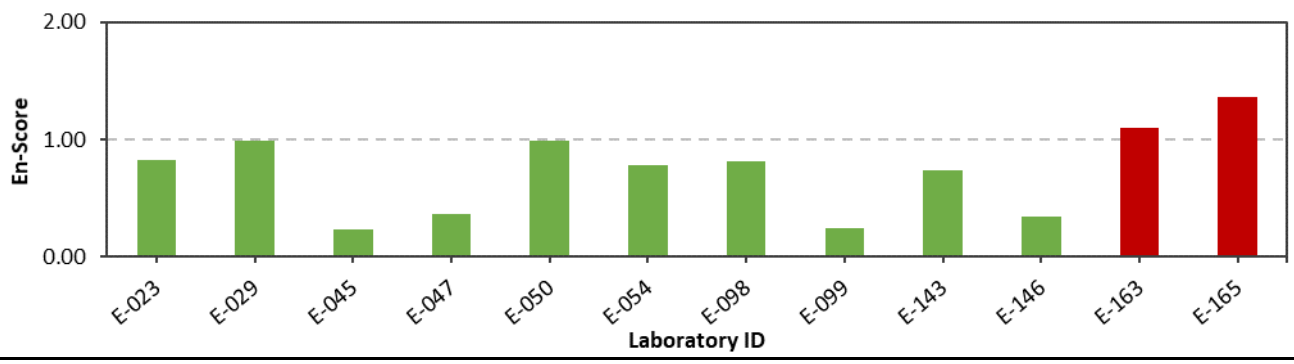
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PT Scheme: JPTPS/P11-015
Test Method Used: BS EN ISO 17892-12:2018+A1:2021
Parameter: Plasticity Index
Unit: %

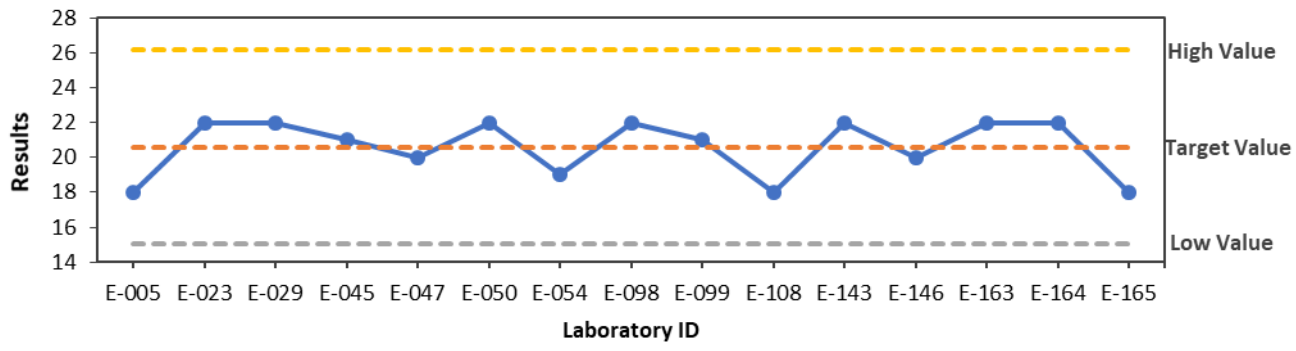
Z score value of the Laboratories Results



En score value of the Laboratories Results



Comparison between Lab Results, Target Value, Low and High Value



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