**CONTRACTS & SPECIFICATIONS COMMITTEE** **LILLE 2025**

**Technical Specification Group** **May 2025**

**Chairman: Mr. Wian Heath (South Africa)** **Report No: TSG 01**

# Report on Independent Laboratory Round Trial 3949 – 4052: January 2024 to December 2024

By

**Independent Laboratory Round Trial (ILRT) Group**

| | |
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## SUMMARY

This ILRT Group Report covers 104 trials (3949 – 4052) for the period January 2024 to December 2024. The range of wool variables covered by this series is similar to the range covered in the previous series, and the source of sample material was similar. The ILRT Group attempts to ensure that the samples tested in the trial are representative of the wool types produced in the home nations of the participating laboratories and in proportion to the quantity of wool tested.

Overall the mean, within-lab and between lab standard deviation for the parameters reported are similar to the previous 6 trials, indicating continuing consistent performance of the member laboratories. Calculations of the 95% Confidence Limits confirm that the ILRT laboratories are producing results within the Confidence Limits reported in the respective IWTO Test Methods for most parameters.

For the reporting period, eight (8) outliers were due to differences in Wool Base and five (5) to differences in VM Base. Wool Base outliers are often the direct result of VM Base outliers in the same trial.

No outliers were due to differences in Laserscan Mean Fibre Diameter. Two (2) outliers were reported for Airflow Mean Fibre Diameter within the same trial.

All laboratories continue to work together to improve performance.

By reporting the results[1-19] of its round trials the ILRT Group is providing commercial participants in the industry with a basis for confidence in the IWTO Certificates produced by its members. The ILRT Group is unique in reporting its technical performance and the series of trials provides a mechanism for ensuring that the member laboratories are harmonised and when differences are identified they can be addressed by the member laboratories.

## INTRODUCTION

This report is prepared on behalf of the Independent Laboratories Round Trial (ILRT) Group. It covers 104 trials tested at a frequency of 2 per week over 52 weeks for the period January 2024 to December 2024.

The 5 laboratories currently participating in the first series ILRT are:

- Australian Wool Testing Authority Ltd (AWTA Ltd) – Bibra Lake, Australia;
- Australian Wool Testing Authority Ltd (AWTA Ltd) – Melbourne, Australia;
- New Zealand Wool Testing Authority Ltd (NZWTA Ltd) - Napier, New Zealand;
- Wool Testing Bureau S.A. (WTBSA) - Port Elizabeth, South Africa; and
- Wool Testing Authority Europe Ltd (WTAE Ltd) – Gwynedd, United Kingdom.

The ILRT Group Members comprise Members from the largest independent wool testing laboratories in the world. The objectives and aims of the Group are:

- To develop co-operation between the Members' laboratories, with a view to ensuring the most correct and uniform application of approved testing and sampling methods as may be set out in the Specifications of the International Wool Testing Organisation (IWTO) and in any associated IWTO regulations;
- To ensure that the Members' laboratories obtain accurate test results having a high level of precision, in their application of those specific IWTO Test Methods and procedures which are relevant to the Group's agreed annual work programme;
- To collect such precision data, with respect to those IWTO specifications being utilised in the ILRT programme, as is required or desirable, but having regard to the principle ILRT functions of harmonising and monitoring the technical performance of the Members' laboratories;
- To assist Members' laboratories in resolving disputes arising from differences in test results, by ascertaining the causes of any discrepancies; and
- To the extent feasible, allow non-competing commercial laboratories to become Participating Laboratories in the inter-laboratory round trials from time to time.

The ILRT Group report is presented to every IWTO Congress.

## SOURCE OF SAMPLE MATERIAL

The ILRT attempts to ensure that the samples tested in the trials are representative of the wool types produced in the home nations of the participating laboratories and in proportion to the quantity of wool tested. Table 1 summarises the countries of origin for the samples used in this series.

**Table 1:** *Source of Sample Material*

| Country of Origin | Number of Samples |
|---|---|
| Australia | 76 |
| New Zealand | 13 |
| South Africa | 13 |
| United Kingdom | 2 |
| **TOTAL** | **104** |

## RANGE OF WOOL TESTED

Sample material covers a similar range of Wool Base, Vegetable Matter Base, Mean Fibre Diameter and Standard Deviation of Fibre Diameter to that reported at previous meetings (Table 2).

**Table 2:** *Ranges of Parameters of Wool Tested (Trials 3949 to 4052)*

| Parameter | Mean | Range |
|---|---|---|
| Wool Base (%) | 59.33 | 44.33 – 68.25 |
| Vegetable Matter Base (%) | 1.59 | 0.10 – 8.60 |
| Mean Fibre Diameter (µm) (Based on IWTO-28) | 25.05 | 16.48 – 37.40 |
| Mean Fibre Diameter (µm) (Based on IWTO-12) | 24.92 | 16.15 – 37.48 |
| Standard Deviation of Fibre Diameter (µm) (Based on IWTO-12) | 5.62 | 3.20 – 9.50 |

## OVERALL RESULTS

### Means and Standard Deviations

The between sub-samples within-laboratory and between-laboratory variation for Wool Base, Vegetable Matter Base are compared, by calculating the Standard Deviation for each and comparing them with data from previous ILRT reports. Similarly, for Mean Fibre Diameter the between test specimens within-laboratory and between-laboratory variation is compared. Comparisons of the overall values for each parameter against values obtained in the 6 previous reporting periods are reported in Table 3 for yield and Table 4 for diameter.

**Table 3:** *Within and Between Laboratory Standard Deviations for Yield Parameters*

| TRIAL PERIOD | WOOL BASE | | | VEGETABALE MATTER BASE | | |
|---|---|---|---|---|---|---|
| | MEAN | BETWEEN SUBS WITHIN LABS | BETWEEN LABS | MEAN | BETWEEN SUBS WITHIN LABS | BETWEEN LABS |
| 3427 – 3530 | 56.85 | 0.36 | 0.26 | 1.87 | 0.23 | 0.18 |
| 3531 – 3634 | 56.66 | 0.39 | 0.23 | 1.77 | 0.20 | 0.18 |
| 3635 – 3740 | 58.31 | 0.38 | 0.26 | 1.75 | 0.20 | 0.15 |
| 3741 – 3844 | 59.45 | 0.38 | 0.17 | 1.65 | 0.20 | 0.12 |
| 3845 – 3948 | 60.36 | 0.42 | 0.24 | 1.65 | 0.21 | 0.14 |
| 3949 – 4052 | 59.33 | 0.39 | 0.25 | 1.59 | 0.20 | 0.14 |
| **OVERALL MEAN** | **58.49** | **0.39** | **0.23** | **1.71** | **0.21** | **0.15** |

**Table 4:** *Within and Between Laboratory Standard Deviations for Diameter Parameters*

| TRIAL PERIOD | MEAN FIBRE DIAMETER AIRFLOW | | | MEAN FIBRE DIAMETER LASERSCAN | | | SD OF FIBRE DIAMETER LASERSCAN | | |
|---|---|---|---|---|---|---|---|---|---|
| | MEAN | BETWEEN SUBS WITHIN LABS | BETWEEN LABS | MEAN | BETWEEN SUBS WITHIN LABS | BETWEEN LABS | MEAN | BETWEEN SUBS WITHIN LABS | BETWEEN LABS |
| 3427 – 3530 | 24.97 | 0.16 | 0.18 | 24.83 | 0.29 | 0.07 | 5.77 | 0.24 | 0.05 |
| 3531 – 3634 | 24.95 | 0.15 | 0.17 | 24.81 | 0.32 | 0.07 | 5.70 | 0.24 | 0.06 |
| 3635 – 3740 | 25.03 | 0.16 | 0.17 | 24.98 | 0.30 | 0.07 | 5.61 | 0.24 | 0.04 |
| 3741 – 3844 | 25.18 | 0.15 | 0.19 | 25.01 | 0.34 | 0.06 | 5.60 | 0.25 | 0.05 |
| 3845 – 3948 | 25.23 | 0.16 | 0.16 | 25.04 | 0.33 | 0.08 | 5.61 | 0.25 | 0.05 |
| 3949 – 4052 | 25.05 | 0.15 | 0.19 | 24.92 | 0.34 | 0.08 | 5.62 | 0.25 | 0.07 |
| **OVERALL MEAN** | **25.07** | **0.16** | **0.18** | **24.93** | **0.32** | **0.07** | **5.65** | **0.24** | **0.05** |

From the variances reported for each trial in Tables 3 and 4 above, the 95% confidence limits for a normal presale test can be calculated. For the purposes of calculation, in the case of Wool Base and VM Base a 2 sub-sample test is assumed. In the case of mean Fibre Diameter, a 2-test specimen test (with 2 readings per test specimen) is assumed. For the Laserscan results, a 4-test specimen test is assumed. These assumptions are the minimum requirements that must be met to issue an IWTO Certificate.

The calculated 95% Confidence Limits are presented in Table 5, along with the Confidence Limits for the respective IWTO Test Method (calculated for the overall mean for each parameter). Comparing the Overall Confidence Limit to the Test Method Confidence Limit confirms that the ILRT laboratories are producing results within the limits of the respective IWTO Test Methods.

**Table 5:** *95% Confidence Limits*

| TRIAL PERIOD | WOOL BASE | | VM BASE | | AIRFLOW | | LASERSCAN | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Mean Fibre Diameter | | Fibre Diameter SD | |
| | Mean | Con. Limit | Mean | Con. Limit | Mean | Con. Limit | Mean | Con. Limit | Mean | Con. Limit |
| 3427 – 3530 | 56.85 | 0.72 | 1.87 | 0.48 | 24.97 | 0.42 | 24.83 | 0.42 | 5.77 | 0.26 |
| 3531 – 3634 | 56.66 | 0.70 | 1.77 | 0.45 | 24.95 | 0.40 | 24.81 | 0.47 | 5.70 | 0.26 |
| 3635 – 3740 | 58.31 | 0.73 | 1.75 | 0.40 | 25.03 | 0.40 | 24.98 | 0.43 | 5.61 | 0.25 |
| 3741 – 3844 | 59.45 | 0.62 | 1.65 | 0.36 | 25.18 | 0.42 | 25.01 | 0.49 | 5.60 | 0.26 |
| 3845 – 3948 | 60.36 | 0.75 | 1.65 | 0.40 | 25.23 | 0.38 | 25.04 | 0.48 | 5.61 | 0.27 |
| 3949 - 4052 | 59.33 | 0.73 | 1.59 | 0.39 | 25.05 | 0.42 | 24.92 | 0.49 | 5.62 | 0.28 |
| **OVERALL MEAN** | 58.49 | 0.71 | 1.71 | 0.41 | 25.07 | 0.41 | 24.93 | 0.46 | 5.65 | 0.26 |
| **(TEST METHOD)** | | (1.10) | | (0.41) | | (0.57) | | (0.47) | | (0.25) |

For any given parameter, the consistency of the confidence limits indicates the laboratory performance has been stable over the periods reported in Tables 3 to 5 inclusive.

Data for IWTO-19 and IWTO-28 for each trial and over all trials in the current reporting period are summarised in Table 6. Corresponding data for IWTO-12 is reported in Table 7.

**Table 6:** *Within and Between Laboratory Standard Deviation Data for IWTO-19 and IWTO-28*

| Trial | Wool Base | | | Vegetable Matter Base | | | Mean Fibre Diameter (Airflow) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Grand Mean | Standard Deviation | | Grand Mean | Standard Deviation | | Grand Mean | Standard Deviation | |
| | | Between Test Spec Within Labs | Between Labs | | Between Test Spec Within Labs | Between Labs | | Between Test Spec Within Labs | Between Labs |
| 3949 | 61.76 | 0.27 | 0.20 | 0.3 | 0.08 | 0.09 | 32.6 | 0.18 | 0.04 |
| 3950 | 61.96 | 0.29 | 0.17 | 0.3 | 0.09 | 0.10 | 31.4 | 0.19 | 0.29 |
| 3951 | 56.01 | 0.67 | 0.77 | 0.5 | 0.55 | 0.41 | 20.5 | 0.07 | 0.25 |
| 3952 | 50.47 | 0.74 | 0.61 | 8.6 | 0.58 | 0.78 | 20.4 | 0.12 | 0.15 |
| 3953 | 53.97 | 0.56 | 0.30 | 1.0 | 0.13 | 0.12 | 20.5 | 0.09 | 0.16 |
| 3954 | 57.22 | 0.69 | 0.00 | 4.5 | 0.59 | 0.58 | 21.4 | 0.21 | 0.00 |
| 3955 | 62.08 | 0.19 | 0.26 | 0.2 | 0.06 | 0.07 | 35.6 | 0.14 | 0.17 |
| 3956 | 56.86 | 0.55 | 0.69 | 0.6 | 0.17 | 0.12 | 22.4 | 0.29 | 0.11 |
| 3957 | 62.50 | 0.21 | 0.00 | 0.2 | 0.06 | 0.02 | 37.4 | 0.18 | 0.19 |
| 3958 | 64.31 | 0.18 | 0.39 | 0.3 | 0.06 | 0.12 | 25.4 | 0.14 | 0.14 |
| 3959 | 64.32 | 0.31 | 0.45 | 0.6 | 0.11 | 0.13 | 16.5 | 0.10 | 0.08 |
| 3960 | 44.61 | 0.78 | 0.20 | 6.6 | 0.88 | 0.00 | 18.5 | 0.07 | 0.19 |
| 3961 | 49.44 | 0.44 | 0.58 | 2.2 | 0.39 | 0.39 | 26.2 | 0.15 | 0.06 |
| 3962 | 48.35 | 0.61 | 0.52 | 3.3 | 0.52 | 0.42 | 26.0 | 0.16 | 0.01 |
| 3963 | 61.40 | 0.58 | 0.16 | 0.2 | 0.06 | 0.07 | 31.2 | 0.13 | 0.29 |
| 3964 | 61.11 | 0.66 | 0.18 | 1.5 | 0.23 | 0.10 | 29.0 | 0.19 | 0.16 |
| 3965 | 65.60 | 0.27 | 0.22 | 0.2 | 0.10 | 0.00 | 28.8 | 0.13 | 0.09 |
| 3966 | 57.60 | 0.67 | 0.32 | 3.3 | 0.38 | 0.00 | 22.2 | 0.10 | 0.08 |
| 3967 | 63.76 | 0.31 | 0.14 | 0.4 | 0.09 | 0.12 | 25.1 | 0.12 | 0.26 |
| 3968 | 66.10 | 0.31 | 0.00 | 0.1 | 0.04 | 0.04 | 32.9 | 0.21 | 0.34 |
| 3969 | 62.37 | 0.44 | 0.23 | 1.3 | 0.22 | 0.20 | 17.2 | 0.16 | 0.16 |
| 3970 | 53.30 | 0.55 | 0.17 | 6.8 | 0.51 | 0.27 | 20.2 | 0.15 | 0.18 |
| 3971 | 57.63 | 0.22 | 0.26 | 0.6 | 0.07 | 0.12 | 22.2 | 0.10 | 0.14 |
| 3972 | 61.27 | 0.45 | 0.10 | 1.4 | 0.20 | 0.02 | 25.3 | 0.13 | 0.11 |
| 3973 | 67.86 | 0.16 | 0.27 | 0.3 | 0.05 | 0.06 | 34.1 | 0.18 | 0.40 |
| 3974 | 62.02 | 0.47 | 0.25 | 1.3 | 0.18 | 0.11 | 24.0 | 0.14 | 0.10 |
| 3975 | 60.67 | 0.18 | 0.22 | 0.5 | 0.15 | 0.04 | 18.3 | 0.13 | 0.14 |
| 3976 | 64.25 | 0.21 | 0.31 | 0.4 | 0.12 | 0.06 | 29.9 | 0.16 | 0.20 |
| 3977 | 55.44 | 0.29 | 0.61 | 0.3 | 0.08 | 0.05 | 22.3 | 0.06 | 0.08 |
| 3978 | 44.33 | 1.12 | 0.49 | 7.9 | 1.20 | 0.42 | 19.9 | 0.14 | 0.15 |
| 3979 | 57.13 | 0.39 | 0.29 | 1.5 | 0.17 | 0.19 | 20.2 | 0.08 | 0.09 |
| 3980 | 59.89 | 0.44 | 0.00 | 0.4 | 0.07 | 0.12 | 32.9 | 0.29 | 0.43 |
| 3981 | 60.06 | 0.30 | 0.07 | 0.7 | 0.11 | 0.10 | 20.0 | 0.08 | 0.11 |
| 3982 | 67.67 | 0.13 | 0.27 | 0.2 | 0.05 | 0.05 | 37.0 | 0.25 | 0.34 |
| 3983 | 60.00 | 0.33 | 0.32 | 0.6 | 0.08 | 0.10 | 20.3 | 0.10 | 0.09 |
| 3984 | 60.64 | 0.29 | 0.00 | 0.3 | 0.06 | 0.05 | 30.9 | 0.24 | 0.17 |
| 3985 | 64.50 | 0.18 | 0.12 | 0.2 | 0.06 | 0.01 | 31.5 | 0.17 | 0.21 |
| 3986 | 60.54 | 0.44 | 0.16 | 0.2 | 0.05 | 0.04 | 35.4 | 0.24 | 0.38 |
| 3987 | 58.39 | 0.44 | 0.08 | 3.5 | 0.32 | 0.07 | 22.0 | 0.14 | 0.17 |
| 3988 | 57.60 | 0.36 | 0.00 | 1.5 | 0.16 | 0.22 | 22.1 | 0.17 | 0.11 |
| 3989 | 60.19 | 0.23 | 0.00 | 0.3 | 0.12 | 0.05 | 19.1 | 0.11 | 0.18 |
| 3990 | 49.82 | 0.37 | 0.46 | 0.3 | 0.08 | 0.13 | 20.1 | 0.13 | 0.21 |
| 3991 | 61.31 | 0.27 | 0.21 | 1.3 | 0.18 | 0.16 | 30.0 | 0.20 | 0.23 |
| 3992 | 61.37 | 0.39 | 0.03 | 1.4 | 0.14 | 0.12 | 23.0 | 0.15 | 0.02 |
| 3993 | 62.76 | 0.19 | 0.22 | 0.4 | 0.08 | 0.10 | 34.6 | 0.10 | 0.21 |
| 3994 | 48.28 | 0.75 | 0.50 | 6.2 | 0.58 | 0.47 | 20.1 | 0.10 | 0.13 |
| 3995 | 56.67 | 0.31 | 0.28 | 0.5 | 0.06 | 0.17 | 22.1 | 0.08 | 0.16 |
| 3996 | 55.90 | 0.32 | 0.39 | 3.6 | 0.35 | 0.00 | 21.1 | 0.15 | 0.03 |

| Trial | Wool Base | | | Vegetable Matter Base | | | Mean Fibre Diameter (Airflow) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Grand Mean | Standard Deviation | | Grand Mean | Standard Deviation | | Grand Mean | Standard Deviation | |
| | | Between Test Spec Within Labs | Between Labs | | Between Test Spec Within Labs | Between Labs | | Between Test Spec Within Labs | Between Labs |
| 3997 | 65.30 | 0.21 | 0.00 | 0.2 | 0.05 | 0.05 | 32.7 | 0.29 | 0.18 |
| 3998 | 63.75 | 0.29 | 0.19 | 0.3 | 0.07 | 0.08 | 20.5 | 0.14 | 0.19 |
| 3999 | 55.43 | 0.29 | 0.34 | 0.7 | 0.19 | 0.11 | 20.0 | 0.07 | 0.22 |
| 4000 | 57.76 | 0.26 | 0.33 | 0.3 | 0.06 | 0.06 | 18.1 | 0.12 | 0.17 |
| 4001 | 67.73 | 0.20 | 0.16 | 0.1 | 0.04 | 0.04 | 37.0 | 0.26 | 0.54 |
| 4002 | 59.49 | 0.48 | 0.22 | 1.1 | 0.10 | 0.10 | 30.5 | 0.17 | 0.23 |
| 4003 | 63.82 | 0.37 | 0.10 | 0.4 | 0.10 | 0.05 | 25.2 | 0.13 | 0.07 |
| 4004 | 54.46 | 0.38 | 0.20 | 3.5 | 0.31 | 0.28 | 17.5 | 0.08 | 0.14 |
| 4005 | 53.59 | 0.54 | 0.29 | 3.4 | 0.46 | 0.26 | 22.1 | 0.15 | 0.23 |
| 4006 | 60.07 | 0.20 | 0.11 | 0.3 | 0.07 | 0.06 | 22.2 | 0.15 | 0.05 |
| 4007 | 58.29 | 0.49 | 0.00 | 0.8 | 0.16 | 0.40 | 17.3 | 0.13 | 0.18 |
| 4008 | 54.14 | 0.50 | 0.06 | 3.8 | 0.42 | 1.05 | 24.4 | 0.21 | 0.18 |
| 4009 | 59.60 | 0.16 | 0.18 | 1.2 | 0.16 | 0.17 | 26.2 | 0.11 | 0.22 |
| 4010 | 46.33 | 0.53 | 0.52 | 2.9 | 0.42 | 0.55 | 27.1 | 0.16 | 0.25 |
| 4011 | 64.82 | 0.22 | 0.34 | 0.5 | 0.12 | 0.00 | 20.2 | 0.08 | 0.18 |
| 4012 | 66.45 | 0.25 | 0.22 | 0.1 | 0.03 | 0.10 | 33.6 | 0.15 | 0.04 |
| 4013 | 58.94 | 0.60 | 0.00 | 1.1 | 0.17 | 0.07 | 31.1 | 0.21 | 0.16 |
| 4014 | 62.07 | 0.30 | 0.33 | 0.3 | 0.04 | 0.09 | 27.7 | 0.17 | 0.22 |
| 4015 | 55.68 | 0.32 | 0.33 | 1.6 | 0.10 | 0.12 | 20.3 | 0.10 | 0.12 |
| 4016 | 59.16 | 0.38 | 0.23 | 3.4 | 0.35 | 0.00 | 23.1 | 0.15 | 0.11 |
| 4017 | 62.56 | 0.19 | 0.19 | 0.3 | 0.09 | 0.03 | 25.5 | 0.12 | 0.31 |
| 4018 | 62.07 | 0.41 | 0.00 | 1.1 | 0.14 | 0.14 | 25.9 | 0.13 | 0.25 |
| 4019 | 52.77 | 0.27 | 0.11 | 0.8 | 0.22 | 0.11 | 19.9 | 0.09 | 0.18 |
| 4020 | 57.55 | 0.38 | 0.24 | 2.7 | 0.24 | 0.06 | 17.3 | 0.07 | 0.23 |
| 4021 | 62.89 | 0.33 | 0.14 | 0.3 | 0.06 | 0.05 | 29.5 | 0.17 | 0.10 |
| 4022 | 66.60 | 0.28 | 0.31 | 0.1 | 0.05 | 0.04 | 35.4 | 0.26 | 0.43 |
| 4023 | 60.11 | 0.27 | 0.13 | 1.4 | 0.18 | 0.05 | 24.1 | 0.15 | 0.19 |
| 4024 | 64.92 | 0.19 | 0.19 | 0.5 | 0.09 | 0.10 | 27.4 | 0.16 | 0.11 |
| 4025 | 56.80 | 0.45 | 0.24 | 1.5 | 0.25 | 0.07 | 19.5 | 0.09 | 0.16 |
| 4026 | 56.96 | 0.74 | 0.19 | 1.3 | 0.13 | 0.00 | 20.0 | 0.19 | 0.17 |
| 4027 | 48.60 | 0.58 | 0.29 | 7.6 | 0.57 | 0.38 | 18.7 | 0.13 | 0.16 |
| 4028 | 66.20 | 0.29 | 0.00 | 0.2 | 0.05 | 0.08 | 35.6 | 0.15 | 0.38 |
| 4029 | 57.47 | 0.19 | 0.18 | 0.8 | 0.11 | 0.12 | 18.7 | 0.06 | 0.10 |
| 4030 | 58.64 | 0.31 | 0.39 | 2.2 | 0.28 | 0.12 | 16.5 | 0.73 | 0.32 |
| 4031 | 54.11 | 0.62 | 0.27 | 5.3 | 0.56 | 0.23 | 19.4 | 0.10 | 0.17 |
| 4032 | 58.01 | 0.27 | 0.23 | 2.3 | 0.23 | 0.02 | 30.3 | 0.14 | 0.27 |
| 4033 | 62.66 | 0.35 | 0.19 | 0.6 | 0.15 | 0.05 | 23.1 | 0.12 | 0.16 |
| 4034 | 64.13 | 0.52 | 0.17 | 0.5 | 0.11 | 0.00 | 25.8 | 0.12 | 0.17 |
| 4035 | 68.25 | 0.17 | 0.30 | 0.1 | 0.03 | 0.03 | 35.6 | 0.24 | 0.29 |
| 4036 | 64.68 | 0.36 | 0.49 | 0.5 | 0.11 | 0.09 | 25.2 | 0.09 | 0.11 |
| 4037 | 52.80 | 0.45 | 0.24 | 0.8 | 0.18 | 0.14 | 22.3 | 0.08 | 0.30 |
| 4038 | 59.70 | 0.47 | 0.70 | 1.7 | 0.19 | 0.08 | 24.0 | 0.15 | 0.23 |
| 4039 | 51.43 | 0.67 | 0.00 | 4.0 | 0.38 | 0.00 | 26.4 | 0.15 | 0.17 |
| 4040 | 66.21 | 0.27 | 0.26 | 0.5 | 0.13 | 0.14 | 27.2 | 0.14 | 0.31 |
| 4041 | 49.88 | 0.49 | 0.57 | 7.0 | 0.56 | 0.40 | 20.2 | 0.10 | 0.16 |
| 4042 | 66.21 | 0.29 | 0.24 | 0.3 | 0.08 | 0.10 | 29.4 | 0.17 | 0.07 |
| 4043 | 66.32 | 0.78 | 0.85 | 0.4 | 0.14 | 0.04 | 25.4 | 0.13 | 0.17 |
| 4044 | 58.52 | 0.39 | 0.34 | 1.1 | 0.19 | 0.22 | 30.0 | 0.22 | 0.16 |
| 4045 | 66.67 | 0.24 | 0.09 | 0.3 | 0.06 | 0.00 | 32.4 | 0.18 | 0.25 |

| Trial | Wool Base | | | Vegetable Matter Base | | | Mean Fibre Diameter (Airflow) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Grand Mean | Standard Deviation | | Grand Mean | Standard Deviation | | Grand Mean | Standard Deviation | |
| | | Between Test Spec Within Labs | Between Labs | | Between Test Spec Within Labs | Between Labs | | Between Test Spec Within Labs | Between Labs |
| 4046 | 63.06 | 0.37 | 0.40 | 0.3 | 0.07 | 0.04 | 20.1 | 0.13 | 0.16 |
| 4047 | 65.36 | 0.49 | 0.32 | 0.3 | 0.07 | 0.09 | 16.8 | 0.11 | 0.36 |
| 4048 | 62.12 | 0.35 | 0.32 | 1.1 | 0.14 | 0.13 | 25.3 | 0.10 | 0.34 |
| 4049 | 60.13 | 0.45 | 0.33 | 2.1 | 0.09 | 0.14 | 22.2 | 0.10 | 0.19 |
| 4050 | 56.86 | 0.43 | 0.53 | 3.2 | 0.29 | 0.21 | 23.3 | 0.10 | 0.18 |
| 4051 | 57.38 | 0.31 | 0.07 | 1.3 | 0.16 | 0.14 | 30.0 | 0.14 | 0.29 |
| 4052 | 54.00 | 0.69 | 0.00 | 5.6 | 0.52 | 0.32 | 20.0 | 0.12 | 0.20 |
| **Mean** | **59.33** | **0.39** | **0.25** | **1.59** | **0.20** | **0.14** | **25.05** | **0.15** | **0.19** |
| **Min** | **44.33** | **0.13** | **0.00** | **0.10** | **0.03** | **0.00** | **16.48** | **0.06** | **0.00** |
| **Max** | **68.25** | **1.12** | **0.85** | **8.60** | **1.20** | **1.05** | **37.40** | **0.73** | **0.54** |

**Table 7:** *Within and Between Laboratory Standard Deviation Data for IWTO-12*

| Trial | Laserscan MFD | | | Laserscan SD | | |
|---|---|---|---|---|---|---|
| | Grand Mean | Standard Deviation | | Grand Mean | Standard Deviation | |
| | | Between Test Spec Within Labs | Between Labs | | Between Test Spec Within Labs | Between Labs |
| 3949 | 32.7 | 0.42 | 0.00 | 7.6 | 0.48 | 0.00 |
| 3950 | 31.0 | 0.33 | 0.08 | 7.3 | 0.21 | 0.06 |
| 3951 | 20.0 | 0.19 | 0.16 | 3.9 | 0.29 | 0.05 |
| 3952 | 20.1 | 0.16 | 0.21 | 4.1 | 0.16 | 0.15 |
| 3953 | 20.0 | 0.22 | 0.13 | 4.1 | 0.32 | 0.00 |
| 3954 | 21.1 | 0.24 | 0.03 | 4.2 | 0.15 | 0.19 |
| 3955 | 35.6 | 0.53 | 0.00 | 8.1 | 0.32 | 0.14 |
| 3956 | 22.0 | 0.18 | 0.00 | 4.7 | 0.19 | 0.00 |
| 3957 | 37.5 | 0.45 | 0.27 | 8.3 | 0.28 | 0.00 |
| 3958 | 25.1 | 0.20 | 0.18 | 5.9 | 0.24 | 0.13 |
| 3959 | 16.2 | 0.16 | 0.00 | 3.3 | 0.21 | 0.05 |
| 3960 | 18.1 | 0.25 | 0.09 | 4.1 | 0.28 | 0.19 |
| 3961 | 26.3 | 0.23 | 0.09 | 5.6 | 0.31 | 0.00 |
| 3962 | 26.1 | 0.35 | 0.09 | 5.7 | 0.21 | 0.19 |
| 3963 | 31.1 | 0.50 | 0.00 | 7.3 | 0.36 | 0.00 |
| 3964 | 28.9 | 0.33 | 0.00 | 6.5 | 0.21 | 0.00 |
| 3965 | 28.9 | 0.25 | 0.02 | 6.1 | 0.25 | 0.00 |
| 3966 | 22.1 | 0.30 | 0.10 | 4.3 | 0.20 | 0.21 |
| 3967 | 25.0 | 0.28 | 0.00 | 5.9 | 0.26 | 0.00 |
| 3968 | 32.9 | 0.41 | 0.13 | 8.3 | 0.19 | 0.07 |
| 3969 | 17.0 | 0.12 | 0.02 | 3.4 | 0.13 | 0.00 |
| 3970 | 19.9 | 0.23 | 0.05 | 4.2 | 0.27 | 0.00 |
| 3971 | 22.2 | 0.25 | 0.03 | 4.8 | 0.25 | 0.06 |
| 3972 | 25.1 | 0.34 | 0.09 | 6.1 | 0.17 | 0.07 |
| 3973 | 34.4 | 0.28 | 0.22 | 8.5 | 0.18 | 0.21 |
| 3974 | 24.2 | 0.22 | 0.10 | 5.8 | 0.23 | 0.00 |
| 3975 | 18.0 | 0.16 | 0.06 | 4.0 | 0.16 | 0.09 |
| 3976 | 29.8 | 0.27 | 0.17 | 6.6 | 0.19 | 0.16 |
| 3977 | 22.3 | 0.28 | 0.00 | 5.0 | 0.14 | 0.08 |
| 3978 | 20.0 | 0.16 | 0.04 | 3.9 | 0.25 | 0.28 |
| 3979 | 19.9 | 0.25 | 0.21 | 4.2 | 0.33 | 0.08 |
| 3980 | 33.4 | 0.66 | 0.51 | 8.8 | 0.36 | 0.00 |
| 3981 | 19.9 | 0.17 | 0.00 | 4.1 | 0.16 | 0.15 |
| 3982 | 37.2 | 0.39 | 0.05 | 9.0 | 0.26 | 0.16 |
| 3983 | 20.1 | 0.18 | 0.16 | 4.1 | 0.17 | 0.00 |
| 3984 | 31.0 | 0.35 | 0.00 | 7.2 | 0.17 | 0.06 |
| 3985 | 31.4 | 0.26 | 0.08 | 7.2 | 0.20 | 0.00 |
| 3986 | 36.0 | 0.47 | 0.26 | 9.5 | 0.36 | 0.25 |
| 3987 | 22.1 | 0.23 | 0.13 | 5.3 | 0.14 | 0.16 |
| 3988 | 22.1 | 0.23 | 0.11 | 4.9 | 0.27 | 0.17 |
| 3989 | 19.0 | 0.17 | 0.15 | 3.8 | 0.14 | 0.00 |
| 3990 | 19.9 | 0.16 | 0.12 | 4.2 | 0.35 | 0.09 |
| 3991 | 30.0 | 0.40 | 0.06 | 6.8 | 0.17 | 0.14 |
| 3992 | 23.1 | 0.48 | 0.00 | 5.2 | 0.24 | 0.00 |
| 3993 | 34.5 | 0.45 | 0.00 | 7.9 | 0.19 | 0.22 |
| 3994 | 19.8 | 0.25 | 0.11 | 4.2 | 0.26 | 0.15 |
| 3995 | 21.9 | 0.17 | 0.21 | 4.4 | 0.21 | 0.04 |
| 3996 | 20.9 | 0.19 | 0.09 | 4.1 | 0.17 | 0.00 |

| Trial | Laserscan MFD | | | Laserscan SD | | |
|---|---|---|---|---|---|---|
| | Grand Mean | Standard Deviation | | Grand Mean | Standard Deviation | |
| | | Between Test Spec Within Labs | Between Labs | | Between Test Spec Within Labs | Between Labs |
| 3997 | 32.8 | 0.48 | 0.14 | 8.3 | 0.26 | 0.04 |
| 3998 | 20.4 | 0.18 | 0.09 | 3.9 | 0.18 | 0.00 |
| 3999 | 19.9 | 0.14 | 0.15 | 4.4 | 0.17 | 0.00 |
| 4000 | 18.0 | 0.13 | 0.17 | 3.6 | 0.24 | 0.00 |
| 4001 | 37.1 | 1.07 | 0.00 | 8.7 | 0.60 | 0.00 |
| 4002 | 30.1 | 0.31 | 0.28 | 7.2 | 0.25 | 0.08 |
| 4003 | 25.1 | 0.32 | 0.00 | 5.9 | 0.19 | 0.01 |
| 4004 | 17.3 | 0.20 | 0.00 | 3.7 | 0.25 | 0.14 |
| 4005 | 22.0 | 0.18 | 0.00 | 4.3 | 0.31 | 0.06 |
| 4006 | 22.0 | 0.15 | 0.00 | 4.4 | 0.12 | 0.06 |
| 4007 | 17.1 | 0.23 | 0.12 | 3.7 | 0.22 | 0.00 |
| 4008 | 24.2 | 0.42 | 0.00 | 5.8 | 0.19 | 0.07 |
| 4009 | 26.1 | 0.21 | 0.14 | 6.1 | 0.14 | 0.07 |
| 4010 | 26.9 | 0.43 | 0.00 | 6.0 | 0.26 | 0.23 |
| 4011 | 20.0 | 0.20 | 0.14 | 3.9 | 0.21 | 0.14 |
| 4012 | 33.6 | 0.40 | 0.00 | 8.4 | 0.25 | 0.20 |
| 4013 | 31.1 | 1.51 | 0.00 | 7.2 | 0.66 | 0.18 |
| 4014 | 27.9 | 1.33 | 0.00 | 7.3 | 0.50 | 0.00 |
| 4015 | 20.0 | 0.20 | 0.07 | 4.3 | 0.34 | 0.00 |
| 4016 | 23.0 | 0.30 | 0.00 | 5.5 | 0.16 | 0.08 |
| 4017 | 25.3 | 0.33 | 0.00 | 5.8 | 0.18 | 0.11 |
| 4018 | 26.0 | 0.30 | 0.16 | 6.6 | 0.19 | 0.14 |
| 4019 | 19.7 | 0.19 | 0.00 | 4.2 | 0.17 | 0.14 |
| 4020 | 17.1 | 0.24 | 0.00 | 3.5 | 0.27 | 0.00 |
| 4021 | 29.1 | 0.31 | 0.21 | 6.5 | 0.20 | 0.00 |
| 4022 | 35.8 | 0.51 | 0.09 | 8.9 | 0.23 | 0.11 |
| 4023 | 23.9 | 0.21 | 0.09 | 6.0 | 0.13 | 0.09 |
| 4024 | 27.2 | 0.21 | 0.09 | 6.1 | 0.22 | 0.00 |
| 4025 | 19.1 | 0.18 | 0.00 | 3.8 | 0.22 | 0.08 |
| 4026 | 19.8 | 0.21 | 0.00 | 3.9 | 0.20 | 0.04 |
| 4027 | 18.2 | 0.14 | 0.03 | 3.8 | 0.23 | 0.00 |
| 4028 | 35.8 | 0.76 | 0.41 | 8.6 | 0.44 | 0.07 |
| 4029 | 18.5 | 0.25 | 0.14 | 3.8 | 0.21 | 0.00 |
| 4030 | 16.2 | 0.15 | 0.06 | 3.3 | 0.13 | 0.17 |
| 4031 | 19.3 | 0.19 | 0.12 | 3.8 | 0.18 | 0.13 |
| 4032 | 29.9 | 0.43 | 0.07 | 7.1 | 0.28 | 0.18 |
| 4033 | 22.8 | 0.19 | 0.00 | 4.6 | 0.20 | 0.00 |
| 4034 | 25.6 | 0.34 | 0.14 | 5.9 | 0.25 | 0.00 |
| 4035 | 35.7 | 1.87 | 0.00 | 8.6 | 0.82 | 0.00 |
| 4036 | 25.0 | 0.65 | 0.00 | 5.7 | 0.18 | 0.06 |
| 4037 | 22.4 | 0.23 | 0.00 | 4.9 | 0.21 | 0.18 |
| 4038 | 23.8 | 0.32 | 0.00 | 6.1 | 0.26 | 0.00 |
| 4039 | 26.0 | 0.35 | 0.00 | 6.2 | 0.26 | 0.00 |
| 4040 | 27.0 | 0.27 | 0.00 | 6.1 | 0.27 | 0.00 |
| 4041 | 19.9 | 0.14 | 0.10 | 4.3 | 0.41 | 0.00 |
| 4042 | 29.1 | 0.40 | 0.11 | 6.6 | 0.30 | 0.00 |
| 4043 | 25.2 | 0.29 | 0.00 | 5.9 | 0.20 | 0.02 |
| 4044 | 29.8 | 0.33 | 0.00 | 7.0 | 0.30 | 0.14 |
| 4045 | 32.6 | 0.44 | 0.00 | 8.4 | 0.27 | 0.13 |
| 4046 | 19.8 | 0.19 | 0.07 | 3.7 | 0.13 | 0.00 |

| Trial | Laserscan MFD | | | Laserscan SD | | |
|---|---|---|---|---|---|---|
| | Grand Mean | Standard Deviation | | Grand Mean | Standard Deviation | |
| | | Between Test Spec Within Labs | Between Labs | | Between Test Spec Within Labs | Between Labs |
| 4047 | 16.2 | 0.15 | 0.07 | 3.2 | 0.22 | 0.26 |
| 4048 | 25.2 | 0.87 | 0.00 | 5.9 | 0.24 | 0.00 |
| 4049 | 21.9 | 0.18 | 0.06 | 4.3 | 0.21 | 0.00 |
| 4050 | 23.1 | 0.30 | 0.00 | 5.6 | 0.31 | 0.00 |
| 4051 | 29.9 | 0.58 | 0.19 | 7.3 | 0.29 | 0.11 |
| 4052 | 19.8 | 0.15 | 0.06 | 3.8 | 0.15 | 0.08 |
| **Mean** | **24.92** | **0.34** | **0.08** | **5.62** | **0.25** | **0.07** |
| **Min** | **16.15** | **0.12** | **0.00** | **3.20** | **0.12** | **0.00** |
| **Max** | **37.48** | **1.87** | **0.51** | **9.50** | **0.82** | **0.28** |

### Ranges of Laboratory Differences

The overall ranges of laboratory differences from the Grand Mean for four parameters are reported in Figures 1-4 together with the statistical limit values of these differences. In the case of Figure 4, which presents the ranges for LASERSCAN, the Airflow statistical limit values have been employed to enable easy comparison with the Airflow. The data are arranged in ascending order of Grand Mean for ease of interpretation, rather than on a trial-by-trial basis. Note also that to ensure easy reading of the graphs the Trial Mean Values for every third value only are printed on the horizontal axes.

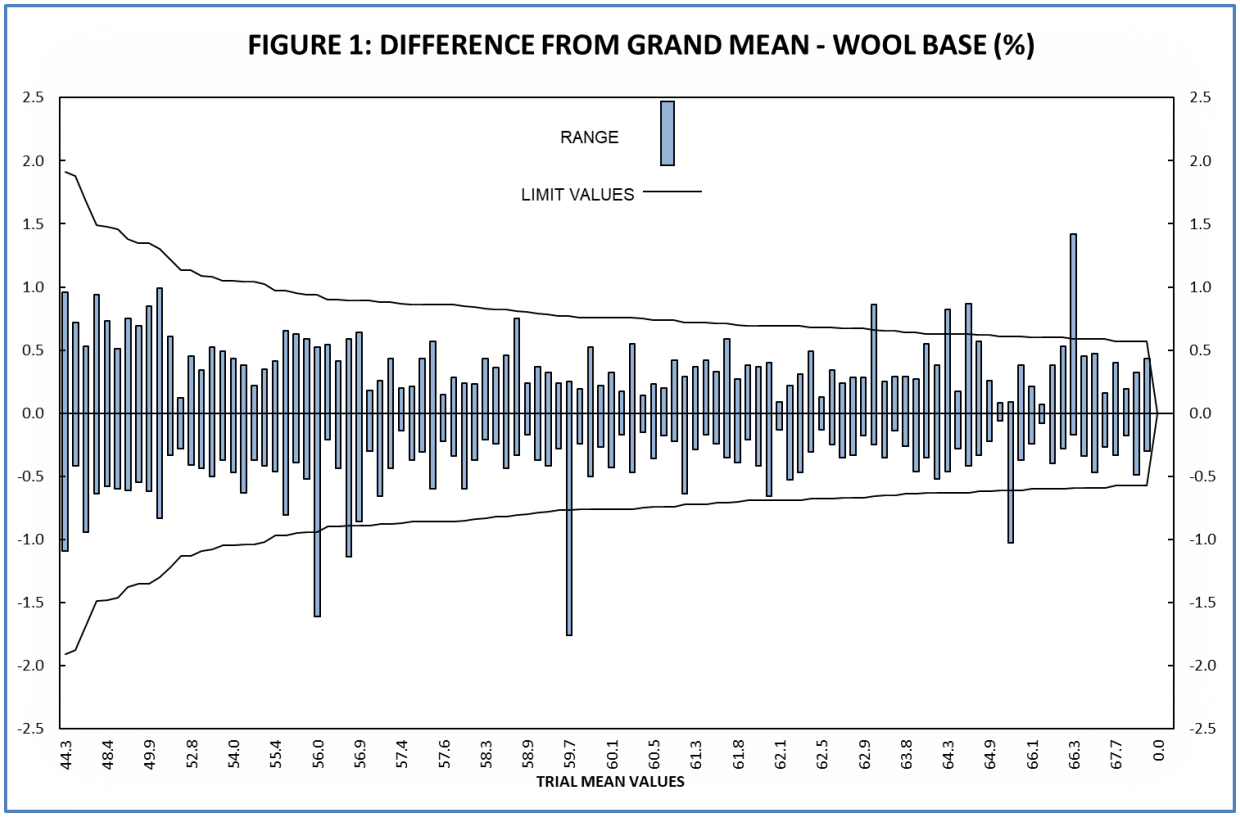


**FIGURE 2: DIFFERENCE FROM GRAND MEAN - VEGETABLE MATTER BASE (%)**

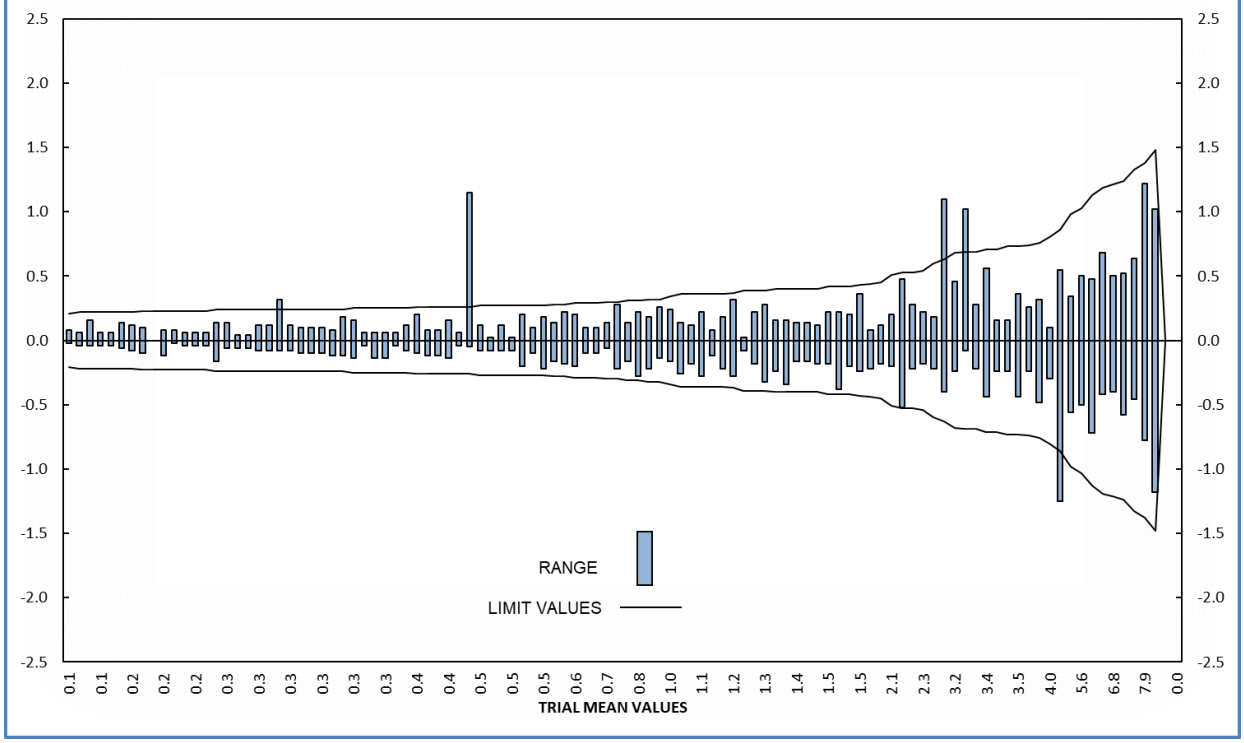
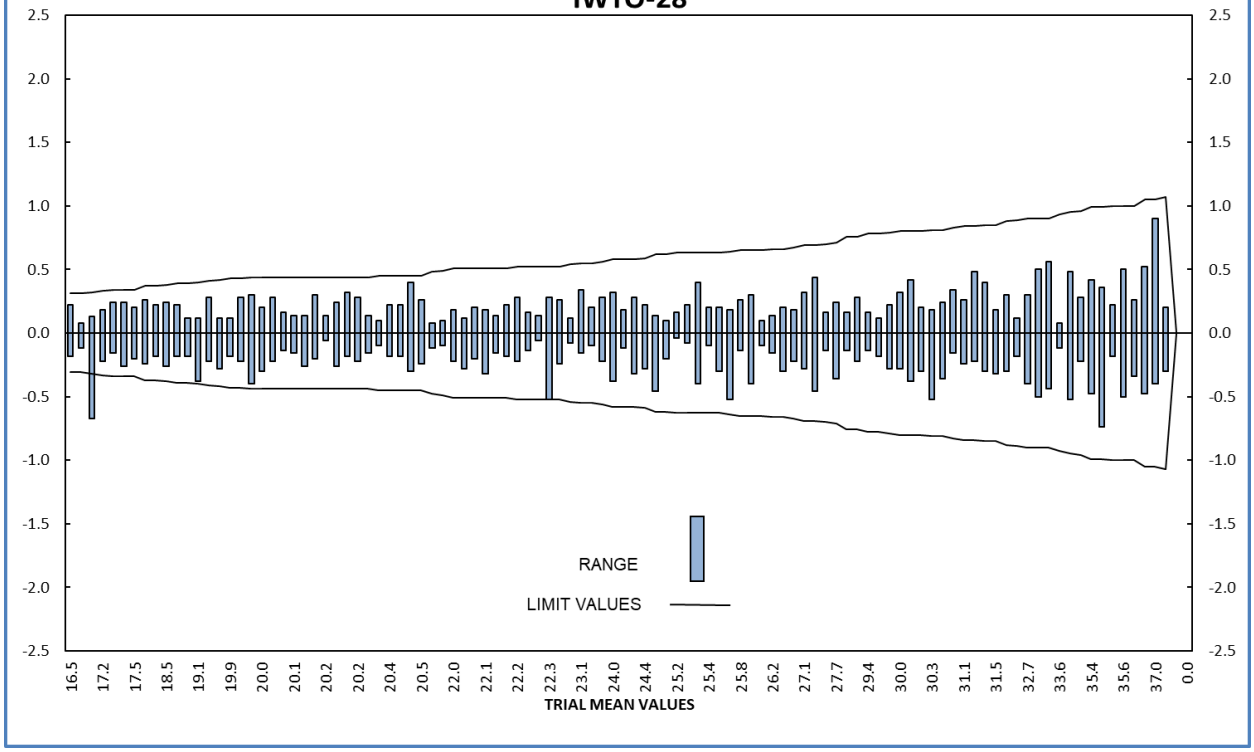
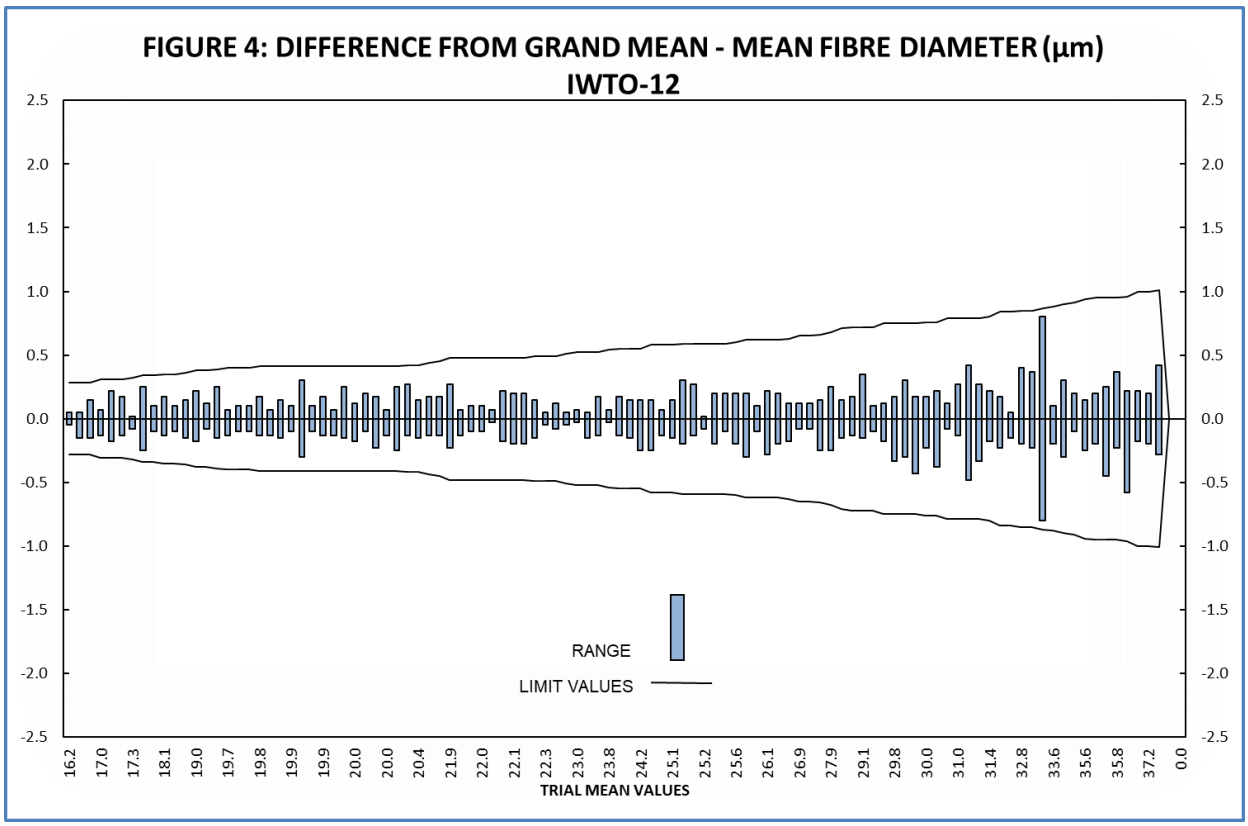



**FIGURE 3: DIFFERENCE FROM GRAND MEAN - MEAN FIBRE DIAMETER (µm) IWTO-28**






Overall the mean, within-laboratory and between-laboratory standard deviation for the parameters reported are similar to the previous 6 trials, indicating continuing consistent performance of the member laboratories. Calculations of the 95% Confidence Limits confirm that the ILRT laboratories are producing results within the Confidence Limits reported in the respective IWTO Test Methods for most parameters.

For the reporting period, eight (8) outliers were due to differences in Wool Base and five (5) to differences in VM Base. Wool Base outliers are often the direct result of VM Base outliers in the same trial.

No outliers were due to differences in Laserscan Mean Fibre Diameter. Two (2) outliers were reported for Airflow Mean Fibre Diameter within the same trial. All laboratories continue to work together to improve performance.

By reporting[1-19] the results of its round trials, the ILRT Group is providing commercial participants in the industry with a basis for confidence in the IWTO Certificates produced by its members. The ILRT Group is unique in reporting its technical performance and the series of trials provides a mechanism for ensuring that the member laboratories are harmonised and when differences are identified they can be addressed by the member laboratories.

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