

CONTRACTS & SPECIFICATIONS COMMITTEE**CONGRESS 2020**

Technical Specifications Group

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Chairman: Mr. W. Heath (South Africa)

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Report on Independent Laboratory Round Trial 3427 - 3530: January 2019 to December 2019

By

Independent Laboratory Round Trial (ILRT) Group

AWTA Ltd - Melbourne

PO Box 240, North Melbourne, VIC 3051, Australia

AWTA Ltd - Fremantle

PO Box 1546, Bibra Lake, WA 6965, Australia

NZWTA Ltd

PO Box 12065, Ahuriri, Napier, New Zealand

WTBSA

PO Box 1867, Port Elizabeth, South Africa

WTAE Ltd

Unit 7, Cybin Estate, Gwynedd LL55 2BX, UK

SUMMARY

This ILRT Group Report covers 104 trials (3427 - 3530) for the period January 2019 to December 2019. 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 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.

The data in the report includes Wool Base, VM Base, Airflow Mean Fibre Diameter, Laserscan Mean Fibre Diameter and Laserscan Standard Deviation of Fibre Diameter.

The mean and 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.

In all, the Limit Values (at the 99% level of confidence) were exceeded on fifteen (15) occasions, which is six (6) less than the theoretical expectation of 21 for the number of trials in this reporting period (assuming all events are independent of each other, $104 \text{ trials} \times 5 \text{ labs} \times 4 \text{ parameters} \times 1\% = 21$).

Three (3) outliers were due to difference in Wool Base, eleven (11) to difference in VM Base, and one (1) to difference in Airflow Mean Fibre Diameter.

For one trial (3482) two laboratories were considered outliers for VM Base. Wool Base and VM Base outliers were detected for trials 3430 and 3432.

By reporting⁽¹⁻¹³⁾ 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.

INTRODUCTION

This report is prepared on behalf of the Independent Laboratories Round Trials (ILRT) Group. It covers 104 trials tested at a frequency of 2 per week over 52 weeks for the period January 2019 to December 2019.

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

- Australian Wool Testing Authority Ltd - Fremantle Laboratory;
- Australian Wool Testing Authority Ltd - Melbourne Laboratory;
- New Zealand Wool Testing Authority Ltd, (NZWTA Ltd), Napier;
- Wool Testing Bureau S.A., (WTB), Port Elizabeth; and
- Wool Testing Authority Europe Ltd (WTAE Ltd), 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 Textile 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	79
New Zealand	10
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 WOOLS TESTED
(TRIALS 3427 - 3530)

PARAMETER	MEAN	RANGE		
Wool Base (%)	56.85	42.68	to	69.68
Vegetable Matter Base (%)	1.87	0.10	to	8.00
Mean Fibre Diameter (µm) (Based on IWTO-28)	24.97	15.26	to	37.70
Mean Fibre Diameter (µm) (Based on IWTO-12)	24.83	14.73	to	37.80
Standard Deviation of Fibre Diameter (µm) (Based on IWTO-12)	5.77	3.00	to	9.40

OVERALL RESULTS**Means & 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			VEGETABLE MATTER BASE		
	MEAN	BETWEEN SUBS WITHIN LABS	BETWEEN LABS	MEAN	BETWEEN SUBS WITHIN LABS	BETWEEN LABS
2905 - 3008	57.71	0.34	0.20	1.56	0.19	0.11
3009 - 3112	58.25	0.37	0.24	1.92	0.22	0.16
3113 - 3216	58.43	0.36	0.23	1.85	0.20	0.15
3217 - 3320	59.11	0.38	0.19	1.94	0.22	0.14
3321 - 3426	58.10	0.37	0.22	1.93	0.22	0.15
3427 - 3530	56.85	0.36	0.26	1.87	0.23	0.18
OVERALL MEAN	58.07	0.36	0.22	1.84	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		
	TRIAL PERIOD MEAN	BETWEEN TEST SPEC WITHIN LABS	BETWEEN LABS	TRIAL PERIOD MEAN	BETWEEN TEST SPEC WITHIN LABS	BETWEEN LABS	TRIAL PERIOD MEAN	BETWEEN TEST SPEC WITHIN LABS	BETWEEN LABS
2905 - 3008	24.98	0.16	0.19	24.77	0.27	0.09	5.78	0.23	0.08
3009 - 3112	25.10	0.16	0.16	24.88	0.27	0.07	5.68	0.23	0.08
3113 - 3216	25.19	0.16	0.22	24.95	0.29	0.08	5.58	0.24	0.08
3217 - 3320	25.17	0.16	0.20	24.93	0.29	0.07	5.53	0.22	0.06
3321 - 3426	25.13	0.15	0.15	24.96	0.30	0.06	5.61	0.23	0.06
3427 - 3530	24.97	0.16	0.18	24.83	0.29	0.07	5.77	0.24	0.05
OVERALL MEAN	25.09	0.16	0.18	24.89	0.28	0.07	5.66	0.23	0.07

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		LASERSCAN	
					Mean Fibre Diameter		Mean Fibre Diameter		Fibre Diameter SD	
	Mean	Con. Limit	Mean	Con. Limit	Mean	Con. Limit	Mean	Con. Limit	Mean	Con. Limit
2905 - 3008	57.71	0.61	1.56	0.34	24.98	0.42	24.77	0.41	5.78	0.28
3009 - 3112	58.25	0.69	1.92	0.43	25.10	0.39	24.88	0.40	5.68	0.27
3113 - 3216	58.43	0.67	1.85	0.41	25.19	0.48	24.95	0.43	5.58	0.28
3217 - 3320	59.11	0.64	1.94	0.42	25.17	0.45	24.93	0.42	5.53	0.25
3321 - 3426	58.10	0.67	1.93	0.43	25.13	0.35	24.96	0.42	5.61	0.25
3427 - 3530	56.85	0.72	1.87	0.48	24.97	0.42	24.83	0.42	5.77	0.26
OVERALL MEAN	58.07	0.67	1.84	0.42	25.09	0.42	24.89	0.42	5.66	0.27
(TEST METHOD)		(1.10)		(0.40)		(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 & IWTO 28

TRIAL	WOOL BASE			VEGETABLE MATTER BASE			MEAN FIBRE DIAMETER		
	GRAND MEAN	STANDARD DEVIATION		GRAND MEAN	STANDARD DEVIATION		GRAND MEAN	STANDARD DEVIATION	
		BETWEEN SUBS WITHIN LABS	BETWEEN LABS		BETWEEN SUBS WITHIN LABS	BETWEEN LABS		BETWEEN TEST SPEC WITHIN LABS	BETWEEN LABS
3427	52.93	0.23	0.24	2.6	0.30	0.21	31.0	0.16	0.44
3428	52.84	0.40	0.19	3.4	0.41	0.28	21.5	0.13	0.24
3429	63.80	0.32	0.21	0.4	0.10	0.09	34.9	0.22	0.00
3430	62.54	0.49	0.44	0.8	0.33	0.10	30.4	0.16	0.21
3431	53.38	0.39	0.24	0.7	0.11	0.08	20.5	0.13	0.13
3432	44.91	0.61	1.28	6.8	0.57	1.07	20.0	0.15	0.21
3433	48.33	0.43	0.00	0.5	0.10	0.00	20.3	0.07	0.19
3434	45.91	0.40	0.39	5.1	0.47	0.45	19.8	0.16	0.19
3435	64.08	0.34	0.00	0.4	0.08	0.05	37.7	0.16	0.26
3436	57.45	0.18	0.32	0.5	0.09	0.11	23.3	0.10	0.26
3437	55.46	0.31	0.30	1.9	0.24	0.30	32.3	0.14	0.42
3438	63.28	0.19	0.28	0.4	0.11	0.11	24.1	0.16	0.28
3439	61.63	0.34	0.12	0.7	0.16	0.07	15.3	0.07	0.16
3440	49.42	0.71	1.00	6.9	0.67	0.70	17.6	0.13	0.14
3441	52.88	0.33	0.28	1.8	0.22	0.12	26.1	0.17	0.30
3442	46.31	0.73	0.67	3.6	0.84	0.34	26.6	0.14	0.16
3443	61.67	0.29	0.39	0.2	0.05	0.08	31.0	0.23	0.23
3444	59.67	0.46	0.26	1.5	0.42	0.00	29.6	0.14	0.23
3445	62.78	0.29	0.00	0.5	0.08	0.08	26.0	0.14	0.21
3446	54.41	0.58	0.24	4.0	0.51	0.24	22.1	0.18	0.17
3447	60.58	0.17	0.20	0.4	0.11	0.04	25.2	0.11	0.23
3448	69.68	0.15	0.14	0.2	0.04	0.06	34.5	0.15	0.27
3449	53.01	0.49	0.26	2.3	0.25	0.11	18.4	0.11	0.06
3450	48.18	0.56	0.38	7.5	0.45	0.43	21.5	0.16	0.12
3451	62.95	0.30	0.06	0.3	0.07	0.05	23.1	0.09	0.18
3452	52.50	0.41	0.00	1.8	0.20	0.17	24.5	0.12	0.16
3453	65.95	0.16	0.23	0.2	0.06	0.00	32.6	0.11	0.18
3454	52.42	0.47	0.20	2.4	0.27	0.34	25.4	0.14	0.32
3455	58.47	0.33	0.12	0.7	0.13	0.09	19.3	0.13	0.18
3456	63.58	0.20	0.08	0.4	0.09	0.00	29.7	0.17	0.12
3457	44.11	0.36	0.15	0.3	0.11	0.18	22.0	0.07	0.09
3458	51.10	0.55	0.37	7.2	0.49	0.42	21.6	0.22	0.16
3459	57.78	0.38	0.33	2.0	0.23	0.00	20.5	0.10	0.14
3460	61.72	0.38	0.14	0.2	0.05	0.06	34.0	0.17	0.35
3461	55.92	0.31	0.40	0.6	0.11	0.09	21.2	0.11	0.19
3462	64.64	0.19	0.00	0.1	0.07	0.02	31.9	0.11	0.22

TABLE 6

WITHIN AND BETWEEN LABORATORY STANDARD DEVIATION DATA FOR IWTO 19 & IWTO 28

TRIAL	WOOL BASE			VEGETABLE MATTER BASE			MEAN FIBRE DIAMETER		
	GRAND MEAN	STANDARD DEVIATION		GRAND MEAN	STANDARD DEVIATION		GRAND MEAN	STANDARD DEVIATION	
		BETWEEN SUBS WITHIN LABS	BETWEEN LABS		BETWEEN SUBS WITHIN LABS	BETWEEN LABS		BETWEEN TEST SPEC WITHIN LABS	BETWEEN LABS
3463	56.75	0.26	0.45	0.5	0.10	0.00	20.2	0.12	0.14
3464	61.13	0.29	0.00	0.3	0.06	0.10	31.6	0.20	0.13
3465	60.49	0.25	0.19	0.6	0.14	0.06	31.2	0.18	0.06
3466	61.08	0.24	0.17	0.2	0.05	0.06	35.3	0.21	0.41
3467	49.92	0.52	0.35	4.1	0.56	0.16	23.2	0.13	0.13
3468	57.64	0.29	0.28	1.5	0.19	0.00	22.3	0.12	0.14
3469	53.73	0.34	0.00	0.5	0.13	0.09	23.1	0.13	0.05
3470	61.77	0.21	0.28	0.3	0.06	0.06	20.2	0.15	0.10
3471	59.58	0.26	0.36	1.3	0.16	0.15	29.9	0.19	0.17
3472	53.99	0.26	0.26	1.2	0.22	0.21	22.1	0.15	0.15
3473	63.47	0.24	0.38	0.5	0.11	0.10	34.6	0.18	0.15
3474	46.51	0.67	0.00	7.1	0.58	0.00	20.3	0.18	0.00
3475	61.10	0.22	0.10	0.4	0.05	0.00	23.1	0.22	0.14
3476	51.20	0.61	0.56	3.5	0.21	0.00	21.3	0.19	0.13
3477	65.20	0.12	0.37	0.1	0.04	0.04	35.9	0.14	0.29
3478	58.57	0.17	0.02	0.2	0.06	0.07	20.4	0.17	0.17
3479	51.61	0.33	0.13	1.2	0.19	0.06	21.2	0.16	0.28
3480	55.67	0.15	0.16	0.2	0.05	0.06	19.3	0.13	0.12
3481	67.10	0.13	0.12	0.1	0.05	0.03	37.6	0.20	0.24
3482	49.02	0.51	1.01	4.0	0.52	1.06	30.0	0.30	0.17
3483	61.92	0.30	0.15	0.5	0.08	0.10	23.9	0.16	0.10
3484	54.49	0.38	0.14	3.8	0.29	0.14	17.4	0.14	0.14
3485	42.68	1.05	1.37	8.0	1.21	1.25	20.8	0.16	0.09
3486	52.70	0.35	0.19	0.4	0.11	0.09	22.2	0.10	0.14
3487	61.03	0.25	0.28	0.8	0.07	0.23	18.5	0.11	0.12
3488	49.64	0.76	0.79	5.3	0.61	0.39	25.1	0.19	0.29
3489	59.89	0.39	0.20	1.8	0.25	0.00	27.1	0.19	0.23
3490	52.26	0.57	0.26	4.4	0.56	0.17	26.3	0.50	0.16
3491	51.67	0.26	0.00	0.6	0.12	0.11	20.3	0.17	0.04
3492	64.39	0.29	0.25	0.3	0.07	0.04	30.0	0.24	0.06
3493	58.53	0.31	0.33	1.9	0.21	0.24	31.0	0.18	0.05
3494	62.54	0.28	0.06	0.6	0.09	0.06	29.2	0.20	0.11
3495	57.01	0.38	0.10	1.4	0.18	0.11	20.2	0.19	0.09
3496	45.97	0.69	0.56	7.4	0.42	0.49	21.3	0.13	0.13
3497	61.42	0.20	0.18	0.7	0.07	0.13	24.4	0.75	0.26
3498	53.40	0.46	0.00	1.7	0.22	0.00	26.3	0.16	0.18
3499	44.12	0.22	0.52	0.7	0.19	0.16	20.5	0.14	0.10
3500	56.14	0.43	0.44	2.8	0.30	0.23	17.7	0.10	0.13
3501	64.49	0.21	0.20	0.3	0.08	0.05	27.2	0.16	0.09
3502	63.67	0.18	0.21	0.2	0.05	0.02	33.1	0.20	0.09
3503	58.39	0.39	0.00	1.4	0.12	0.11	25.2	0.13	0.14

TABLE 6

WITHIN AND BETWEEN LABORATORY STANDARD DEVIATION DATA FOR IWTO 19 & IWTO 28

TRIAL	WOOL BASE			VEGETABLE MATTER BASE			MEAN FIBRE DIAMETER		
	GRAND MEAN	STANDARD DEVIATION		GRAND MEAN	STANDARD DEVIATION		GRAND MEAN	STANDARD DEVIATION	
		BETWEEN SUBS WITHIN LABS	BETWEEN LABS		BETWEEN SUBS WITHIN LABS	BETWEEN LABS		BETWEEN TEST SPEC WITHIN LABS	BETWEEN LABS
3504	62.27	0.30	0.00	0.3	0.05	0.11	28.1	0.14	0.25
3505	53.43	0.47	0.00	2.2	0.43	0.00	18.4	0.11	0.09
3506	59.19	0.27	0.06	1.2	0.17	0.14	20.3	0.09	0.12
3507	44.77	0.47	1.16	6.4	0.78	1.23	19.1	0.14	0.31
3508	65.66	0.34	0.21	0.1	0.07	0.00	36.5	0.23	0.13
3509	60.71	0.33	0.20	0.5	0.12	0.06	17.5	0.10	0.14
3510	57.52	0.36	0.00	1.8	0.13	0.13	15.7	0.05	0.13
3511	48.46	0.80	0.38	5.3	0.84	0.56	18.3	0.10	0.15
3512	59.59	0.42	0.00	1.6	0.19	0.10	29.9	0.24	0.25
3513	57.24	0.25	0.21	0.8	0.10	0.07	23.4	0.22	0.19
3514	61.48	0.34	0.00	0.5	0.11	0.05	29.2	0.25	0.26
3515	66.28	0.17	0.07	0.2	0.04	0.06	30.4	0.18	0.26
3516	62.72	0.20	0.00	0.7	0.11	0.12	25.2	0.09	0.28
3517	56.78	0.32	0.00	1.0	0.18	0.00	21.9	0.07	0.16
3518	50.55	0.73	0.52	4.3	0.68	0.28	24.3	0.10	0.30
3519	45.03	0.58	0.58	4.1	0.68	0.75	25.6	0.23	0.41
3520	60.71	0.25	0.13	0.5	0.06	0.10	27.2	0.12	0.39
3521	45.58	0.43	0.54	7.7	0.54	0.45	20.3	0.10	0.17
3522	60.86	0.31	0.26	0.5	0.11	0.11	27.3	0.16	0.23
3523	61.01	0.26	0.14	0.6	0.11	0.11	25.4	0.16	0.16
3524	60.74	0.33	0.28	1.6	0.26	0.12	30.1	0.09	0.44
3525	68.67	0.18	0.18	0.1	0.03	0.03	31.1	0.25	0.30
3526	62.98	0.26	0.06	0.3	0.07	0.09	20.2	0.10	0.10
3527	61.02	0.16	0.19	0.6	0.16	0.11	15.8	0.12	0.05
3528	48.77	0.68	0.44	4.1	0.34	0.43	25.2	0.16	0.21
3529	57.52	0.34	0.00	1.4	0.13	0.18	22.2	0.16	0.11
3530	54.25	0.46	0.12	4.4	0.43	0.27	22.3	0.13	0.14
Mean	56.85	0.36	0.26	1.87	0.23	0.18	24.97	0.16	0.18
Min	42.68	0.12	0.00	0.10	0.03	0.00	15.26	0.05	0.00
Max	69.68	1.05	1.37	8.00	1.21	1.25	37.70	0.75	0.44

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
3427	31.1	0.23	0.21	7.7	0.33	0.00
3428	21.1	0.18	0.03	4.2	0.20	0.06
3429	34.8	0.41	0.00	8.4	0.34	0.00
3430	30.1	0.20	0.14	6.9	0.18	0.09
3431	20.1	0.20	0.06	4.2	0.18	0.07
3432	20.1	0.26	0.00	4.0	0.27	0.02
3433	20.1	0.12	0.03	3.9	0.14	0.06
3434	19.8	0.27	0.00	3.9	0.26	0.00
3435	37.6	0.50	0.13	9.0	0.39	0.00
3436	23.1	0.22	0.00	5.1	0.22	0.15
3437	32.3	0.39	0.06	7.5	0.26	0.00
3438	24.2	0.24	0.15	6.1	0.23	0.00
3439	14.7	0.14	0.04	3.0	0.22	0.11
3440	17.3	0.24	0.06	3.9	0.28	0.00
3441	26.1	0.26	0.20	6.4	0.24	0.00
3442	26.8	0.53	0.16	6.0	0.35	0.00
3443	31.0	0.26	0.09	7.6	0.30	0.08
3444	29.3	0.23	0.14	7.2	0.48	0.19
3445	26.1	0.35	0.00	6.4	0.18	0.06
3446	22.2	0.33	0.00	5.7	0.24	0.00
3447	25.0	0.36	0.17	6.4	0.19	0.00
3448	34.6	0.51	0.16	8.2	0.30	0.00
3449	18.0	0.16	0.00	3.8	0.25	0.04
3450	21.2	0.18	0.00	4.5	0.20	0.00
3451	23.1	0.27	0.05	5.9	0.27	0.00
3452	24.3	0.32	0.11	6.5	0.22	0.09
3453	32.8	0.39	0.00	8.3	0.19	0.00
3454	25.0	0.38	0.00	6.4	0.20	0.00
3455	18.8	0.14	0.12	3.9	0.18	0.07
3456	29.8	0.31	0.00	7.1	0.17	0.12
3457	21.9	0.23	0.00	6.0	0.25	0.05
3458	21.5	0.20	0.00	5.4	0.17	0.00
3459	20.2	0.16	0.02	4.4	0.27	0.00
3460	34.3	0.49	0.26	9.4	0.40	0.00
3461	20.9	0.22	0.00	4.5	0.20	0.07
3462	32.2	0.28	0.00	8.2	0.15	0.14
3463	20.0	0.19	0.00	4.3	0.25	0.02
3464	31.5	0.44	0.26	7.6	0.31	0.00
3465	31.0	0.43	0.00	7.8	0.25	0.00
3466	36.5	0.61	0.00	9.4	0.24	0.06
3467	23.0	0.19	0.19	6.0	0.30	0.00

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
3468	22.1	0.25	0.00	4.5	0.22	0.00
3469	23.0	0.16	0.09	4.9	0.20	0.08
3470	19.9	0.24	0.07	4.1	0.12	0.04
3471	29.8	0.29	0.00	6.8	0.18	0.00
3472	22.1	0.25	0.00	5.0	0.24	0.00
3473	34.3	0.29	0.18	7.9	0.25	0.13
3474	19.9	0.13	0.14	4.2	0.15	0.12
3475	22.8	0.14	0.00	4.7	0.13	0.10
3476	20.9	0.24	0.00	4.2	0.22	0.04
3477	36.1	0.39	0.54	8.5	0.40	0.00
3478	20.3	0.15	0.04	4.0	0.17	0.09
3479	20.9	0.23	0.08	4.4	0.29	0.00
3480	19.1	0.10	0.07	3.8	0.23	0.00
3481	37.8	0.46	0.08	8.6	0.21	0.24
3482	29.9	0.59	0.00	6.9	0.27	0.21
3483	23.8	0.18	0.13	5.8	0.10	0.14
3484	17.1	0.20	0.06	3.5	0.31	0.00
3485	20.9	0.20	0.00	4.1	0.24	0.00
3486	22.0	0.21	0.10	5.0	0.25	0.08
3487	18.1	0.14	0.04	3.6	0.18	0.07
3488	24.8	0.73	0.22	6.5	0.26	0.00
3489	26.8	0.71	0.00	6.3	0.17	0.00
3490	26.1	0.36	0.00	6.5	0.19	0.00
3491	20.0	0.20	0.00	4.5	0.12	0.09
3492	30.5	0.64	0.12	7.7	0.31	0.09
3493	30.5	0.28	0.29	7.4	0.45	0.20
3494	29.0	0.45	0.16	6.4	0.21	0.00
3495	19.9	0.20	0.03	4.1	0.19	0.09
3496	21.0	0.20	0.05	5.1	0.31	0.10
3497	23.9	0.21	0.04	6.0	0.18	0.00
3498	25.9	0.31	0.00	6.4	0.24	0.13
3499	20.1	0.20	0.00	5.3	0.35	0.00
3500	17.2	0.10	0.05	3.6	0.20	0.08
3501	26.9	0.28	0.04	6.2	0.17	0.12
3502	33.3	0.23	0.08	8.3	0.27	0.04
3503	25.0	0.34	0.00	5.8	0.30	0.00
3504	27.9	0.27	0.00	6.5	0.23	0.14
3505	18.0	0.16	0.14	3.7	0.21	0.00
3506	20.1	0.16	0.13	4.2	0.25	0.00
3507	18.9	0.19	0.11	3.6	0.26	0.00
3508	36.4	0.41	0.00	8.5	0.20	0.16

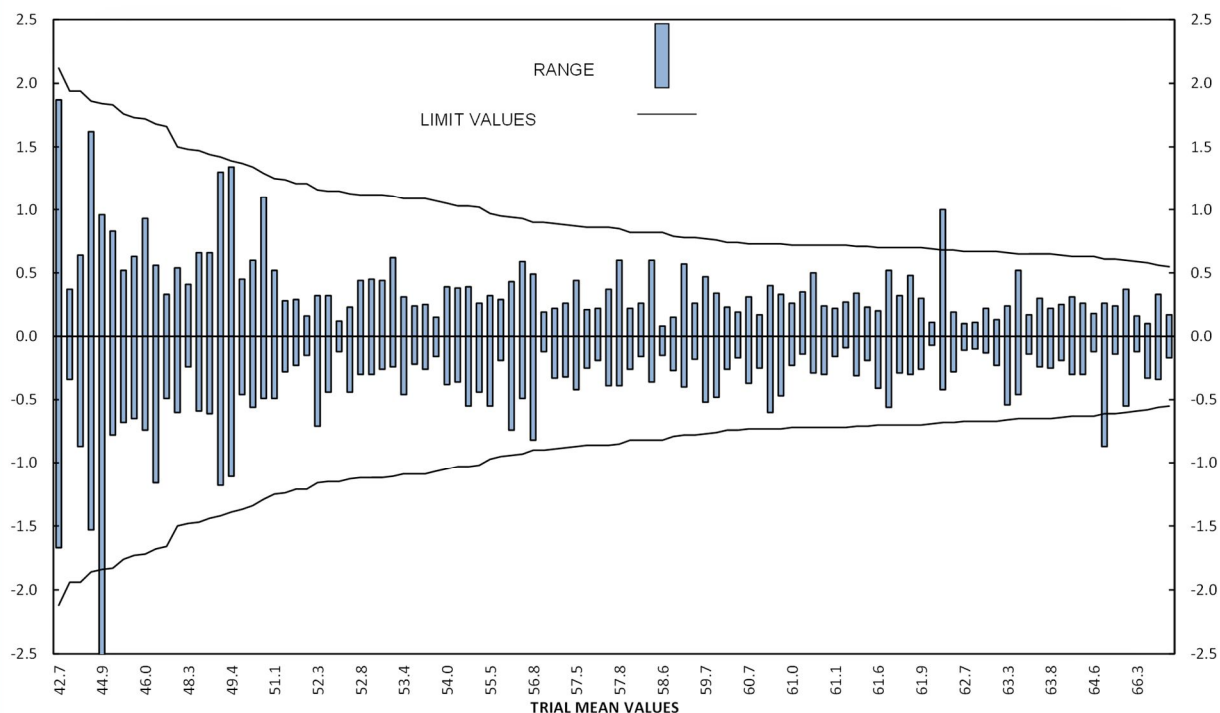
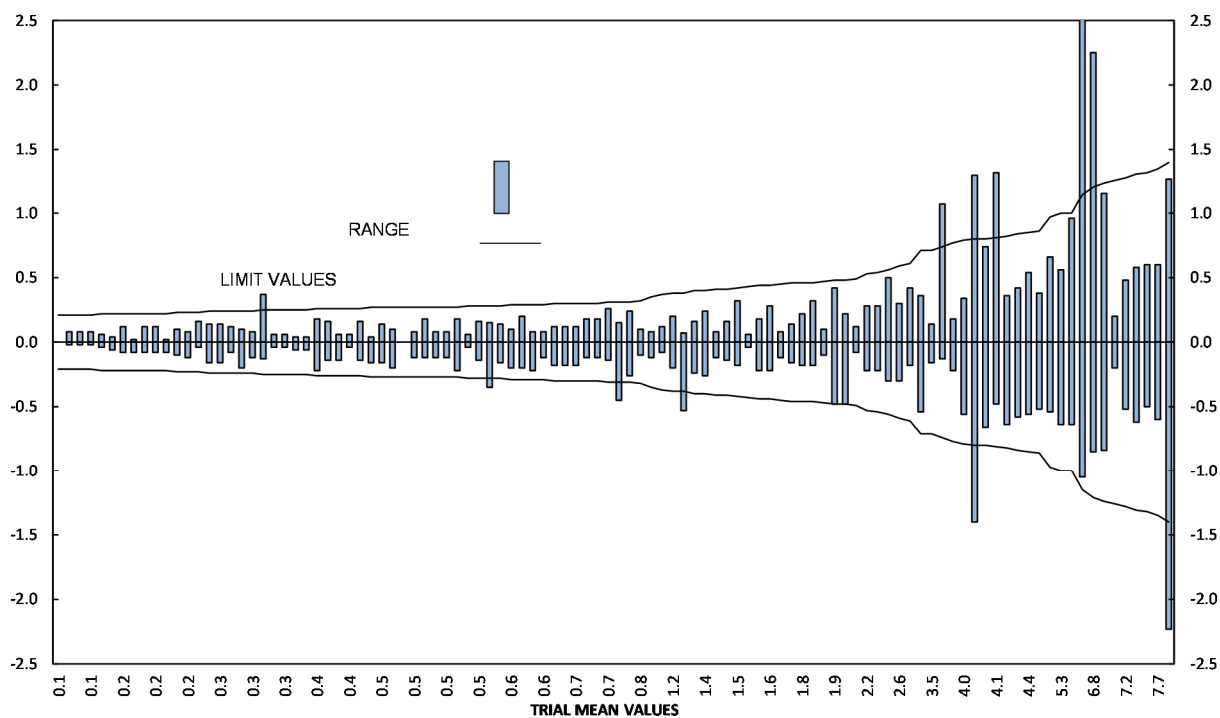
TABLE 7

WITHIN AND BETWEEN LABORATORY STANDARD DEVIATION DATA FOR IWTO-12

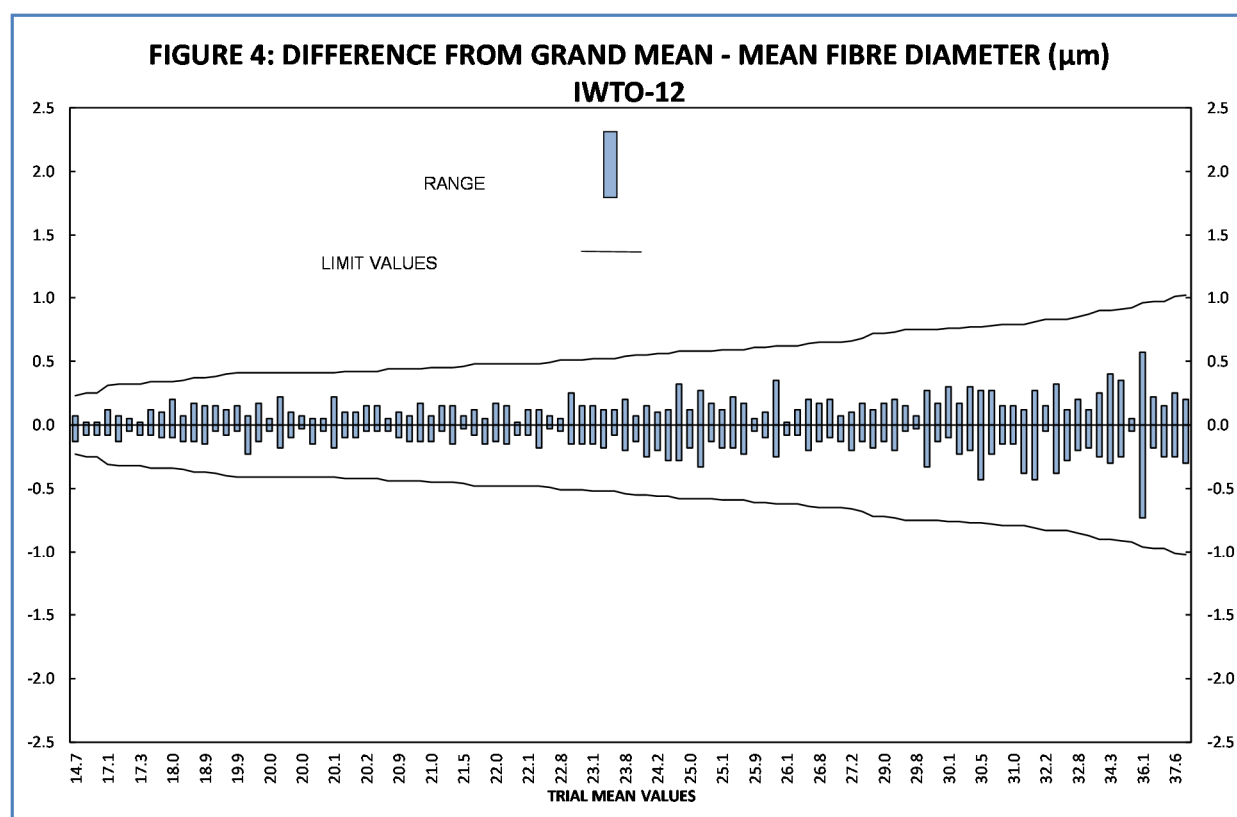
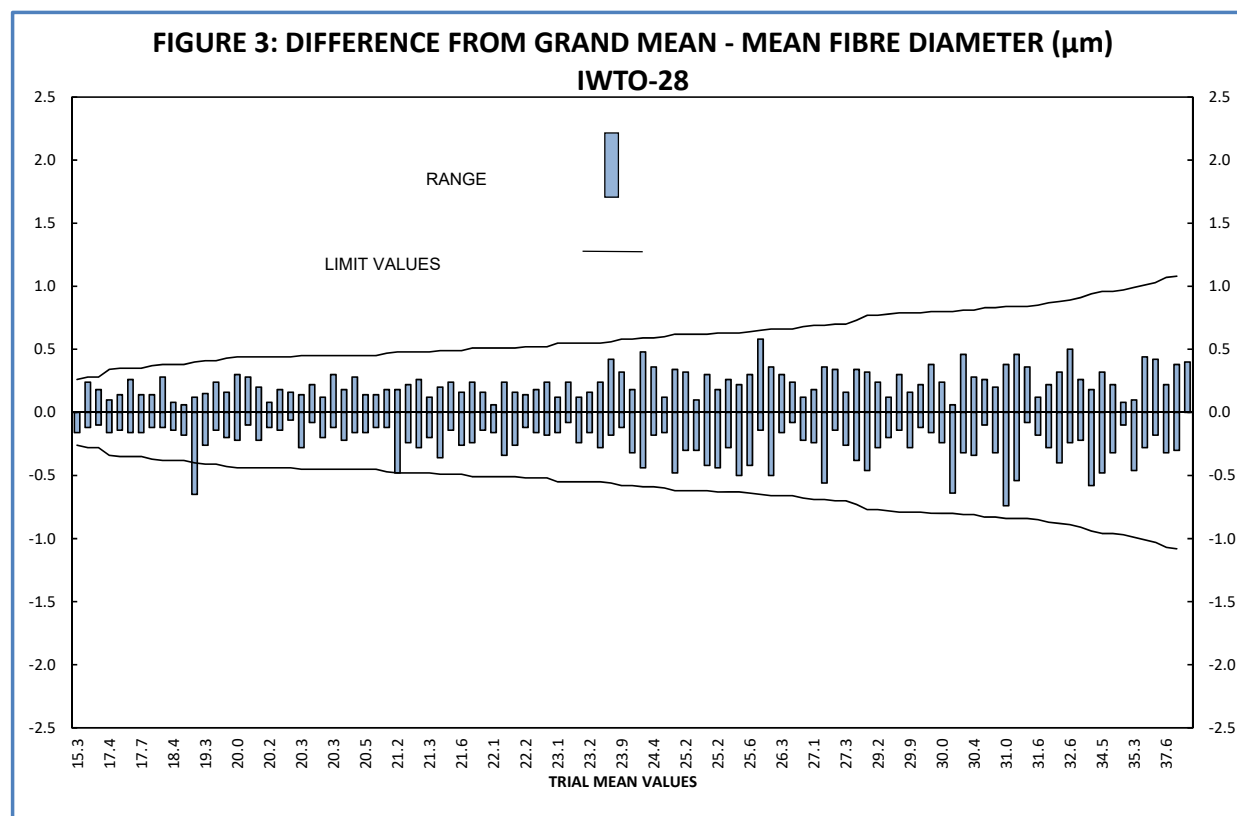
TRIAL	LASERSCAN MFD			LASERSCAN SD		
	GRAND MEAN	STANDARD DEVIATION		GRAND MEAN	STANDARD DEVIATION	
		BETWEEN TEST SPEC WITHIN LABS	BETWEEN LABS		BETWEEN TEST SPEC WITHIN LABS	BETWEEN LABS
3509	17.3	0.09	0.00	3.4	0.11	0.00
3510	15.3	0.39	0.00	3.3	0.35	0.07
3511	18.0	0.19	0.08	3.8	0.26	0.08
3512	29.8	0.29	0.19	7.1	0.28	0.11
3513	23.1	0.20	0.00	5.7	0.26	0.00
3514	29.0	0.59	0.00	6.6	0.33	0.00
3515	30.8	0.41	0.07	8.0	0.23	0.00
3516	25.2	0.27	0.17	6.1	0.19	0.00
3517	22.1	0.18	0.00	4.9	0.22	0.08
3518	24.2	0.21	0.06	6.0	0.25	0.20
3519	25.9	0.32	0.00	5.8	0.30	0.00
3520	27.2	0.26	0.04	6.2	0.28	0.08
3521	20.0	0.27	0.13	4.3	0.23	0.12
3522	27.0	0.24	0.05	6.3	0.21	0.14
3523	25.2	0.33	0.21	6.1	0.21	0.00
3524	30.1	0.42	0.00	6.8	0.26	0.00
3525	32.2	0.44	0.25	8.5	0.31	0.09
3526	20.0	0.21	0.00	3.8	0.14	0.10
3527	15.4	0.16	0.04	3.2	0.21	0.00
3528	25.1	0.35	0.00	6.4	0.38	0.00
3529	22.0	0.24	0.00	4.7	0.18	0.00
3530	22.1	0.22	0.08	4.6	0.23	0.00
Mean	24.83	0.29	0.07	5.77	0.24	0.05
Min	14.73	0.09	0.00	3.00	0.10	0.00
Max	37.80	0.73	0.54	9.40	0.48	0.24

Ranges of Laboratory Differences

The overall ranges of laboratory differences from the Grand Mean for four parameters are reported in Figures 1, 2, 3, and 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 1: DIFFERENCE FROM GRAND MEAN - WOOL BASE (%)**FIGURE 2: DIFFERENCE FROM GRAND MEAN - VEGETABLE MATTER BASE (%)**

NOTE: For trial 3482 two laboratories were outside the control limits.



In all, the Limit Values (at the 99% level of confidence) were exceeded on fifteen (15) occasions, which is six (6) less than the theoretical expectation of 21 for the number of trials in this reporting period (assuming all events are independent of each other, 104 trials x 5 labs x 4 parameters x 1% = 21).

Three (3) outliers were due to difference in Wool Base, eleven (11) to difference in VM Base, and one (1) to difference in Airflow Mean Fibre Diameter.

For one trial (3482) two laboratories were considered outliers for VM Base. Wool Base and VM Base outliers were detected for trials 3430 and 3432.

By reporting 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.

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