

# Quality control standards, recognised practice and metrology of greasy wool

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Mr Ian Ashman

Australian Wool Testing Authority Ltd

## About AWTA Ltd

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- Take and test wool samples
- Issue certified results
- Guarantee results
- Public company
- Owned by industry



# Company capabilities

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- Textile testing
- R&D
- Computer services
- Raw wool testing
  - Yield and micron
  - Staple length and strength
  - Other



# Why test wool?

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- Equity for buyer and seller
- Allows specification
  - Trading
  - Processing and manufacturing performance
  - Competition with man-made fibres
- Not compulsory

# Contract specifications

## A GUIDE TO AUSTRALIAN AND NEW ZEALAND WOOL SPECIFICATIONS 2000

### 1. AUSTRALIAN GREASY WOOL SPECIFICATION

REFERENCE	UNIT
MEAN FIBRE DIAMETER	Micron
<b>(IWTO-28 for wool tested prior to 1 July 2000 and IWTO-12 for wool tested on or after that date)<sup>1</sup> :</b> <i>Maximum for any component lot:</i>	<i>Micron</i>
VEGETABLE MATTER BASE (IWTO-19): <i>Maximum for any component lot:</i>	% %
MEAN STAPLE LENGTH (IWTO-7, 30): <i>Minimum for any component lot:</i>	mm Mm
MEAN STAPLE STRENGTH (IWTO-7, 30): <i>Minimum for any component lot:</i>	N/Ktex N/Ktex

*All component lots shall be tested as per IWTO testing standards and regulations for yield (IWTO 16%), micron, vegetable matter, staple length and staple strength. IWTO Certificates (combination certificates and if requested prior to entering the Contract certificates for component lots) shall be supplied for the above characteristics.*

# IWTO

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**I**nternational  
**W**ool  
**T**extile  
**O**rganisation



- International rules for testing and trading wool textiles.

# Technical standards

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- Licensed by IWTO
- Accredited by Interwoollabs
  - Round trials
- Accredited by NATA
- Audits
  - Internal
  - External



# Yield and Micron



**AUSTRALIAN WOOL TESTING AUTHORITY LTD**

Regd. Office: 70 Robertson Street, Kensington, Victoria 3031 P.O. Box 240, North Melbourne 3051 Tel: (03) 9371 4100 Fax: (03) 9371 4191

## IWTO TEST CERTIFICATE

ORIGINAL

3-07858222-P2 \*CLASSED GROWER LOT TEST METHODS IWTO-19,12 PAGE 1

AUSTRALIAN WOOL NETWORK PTY LTD MELBOURNE 13 BALES

REF. M39M 101 \*KOOLMURT \*AAAM

297673

TOTAL BALE WEIGHTS:

TEST HOUSE GROSS 2 442 KG TARE 26 KG NETT 2 416 KG

TEST RESULTS:

1. WOOL BASE - 2 SUBSAMPLES 57.16 %
2. MEAN FIBRE DIAMETER - 4 SPECIMENS 19.5 MICRONS
3. COEFFICIENT OF VARIATION OF DIAMETER 21.5 %
4. VEGETABLE MATTER BASE INCLUDING \*\*\*\* & HARD HEADS-TWIGS 1.6 %

CALCULATED COMMERCIAL YIELDS & CLEAN MASSES:

5. IWTO SCHLUM DRY T&N YIELD (1.0%FM) 65.6 % 1 585 KG
6. IWTO SCoured YIELD at 1% REGAIN 70.3 % 1 698 KG
7. JAPANESE CLEAN SCoured YIELD 67.3 % 1 626 KG
8. AUSTRALIAN CARBONISING YIELD 63.6 % 1 537 KG

ADDITIONAL INFORMATION:

9. MEAN FIBRE CURVATURE 64 DEG/MM
10. COMFORT FACTOR 98.8 %
11. VEGETABLE MATTER COMPOSITION (B) 0.0 (S) 1.6 (H) 0.0
12. \*DARK & MEDULLATED FIBRE RISK 2

CHARGE: \$ 38.90 GST @ 10% : \$ 3.89 TOTAL CHARGE: \$ 42.79  
THIS CERTIFICATE HAS BEEN COMBINED IN 2-07490881-J1

08.1278 08 8246 0000

34497885 34479699

*KOOLMURT		*AAAM	
BALE NO.	GROSS *TARE NETT	BALE NO.	GROSS *TARE NETT
1	192 2 190	11	196 2 194
2	191 2 189	12	168 2 166
3	189 2 187	14	191 2 189
4	176 2 174	16	192 2 190
6	201 2 199	17	202 2 200
8	189 2 187	19	177 2 175
9	178 2 176		
GROSS 2 442 KG TARE 26 KG NETT 2 416 KG			



# CERTIFICATE

## TEST METHODS IWTO-19,12

CONTINUED ON NEXT PAGE  
TEST CONDUCTED AT MELBOURNE LABORATORY  
BALES SAMPLED AT MELBOURNE ON 14.03.2006  
AWTA LTD SERVICE TIME 3.3 DAYS  
ISSUED ON 17.03.2006, PRINTED ON 02.05.2006

KATS 1



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01017/05

For and on behalf of Australian Wool Testing Authority Ltd  
MICHAEL A. JACKSON B.Sc (Hons) MANAGING DIRECTOR  
DR. GEORG H. BEILHARZ Dip App Sc., M.Sc., Ph.D. GENERAL MANAGER - LABORATORY OPERATIONS



CLIENT USE ONLY



# AUSTRALIAN WOOL TEXTILE TRAINING CENTRE

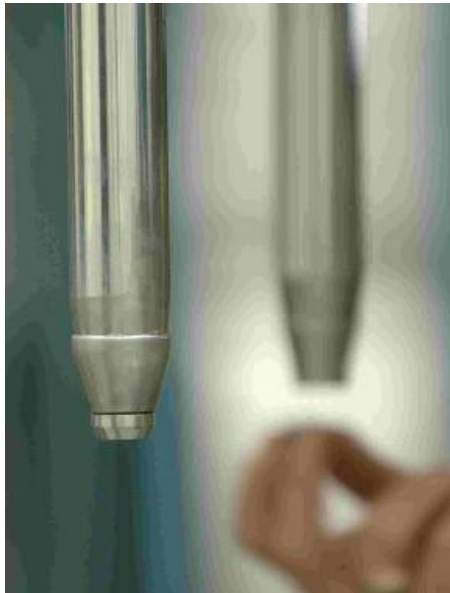


# Yield and Micron – bale weighing



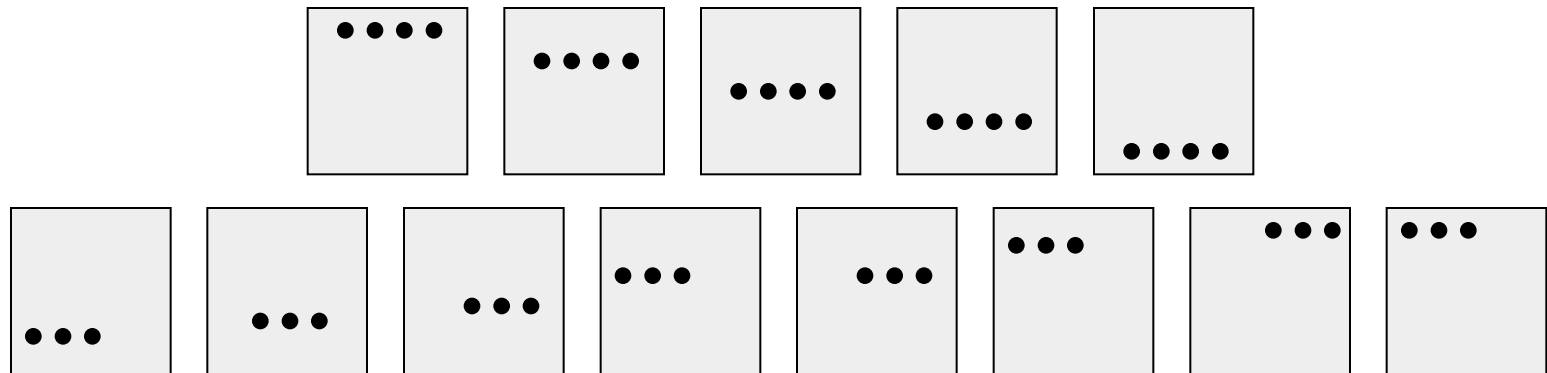
*KOOLOMURT				*AAAM			
BALE NO.	GROSS	*TARE	NETT	BALE NO.	GROSS	*TARE	NETT
1	192	2	190	11	196	2	194
2	191	2	189	12	168	2	166
3	189	2	187	14	191	2	189
4	176	2	174	16	192	2	190
6	201	2	199	17	202	2	200
8	189	2	187	19	177	2	175
9	178	2	176				
GROSS 2 442 KG TARE				26 KG	NETT 2 416 KG		

# Yield and Micron – core sampling



# Core sampling

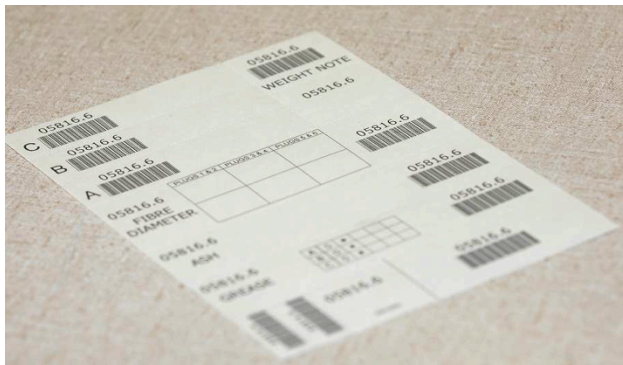
- 20 or more cores per lot
- Same number of cores each bale
- Every bale core sampled



# Replicate testing

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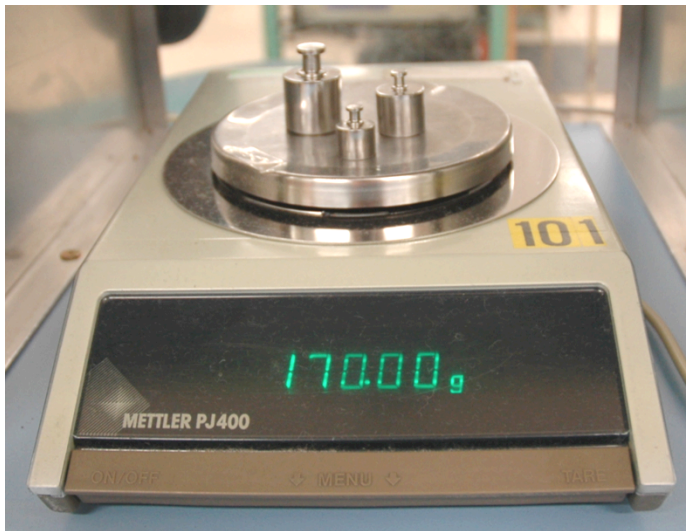
- Two or more sub-samples
- Statistical tolerance
  - 95% confidence limits
- Check tests



# Calibration

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- All measuring instrumentation
  - Schedule
  - Records



# Yield



- Wash sample of known weight
- Oven dry mass
- Weigh residual components
  - Vegetable Matter
  - Grease
  - Mineral Content
- Used to determine quantity of wool

TEST RESULTS:

1. WOOL BASE - 2 SUBSAMPLES

57.16 %

# Yields

## CALCULATED COMMERCIAL YIELDS & CLEAN MASSES:

5.	IWTO SCHLUM DRY T&N YIELD (1.0%TFM)	65.6 %	1 585 KG
6.	IWTO SCOURED YIELD at 17% REGAIN	70.3 %	1 698 KG
7.	JAPANESE CLEAN SCOURED YIELD	67.3 %	1 626 KG
8.	AUSTRALIAN CARBONISING YIELD	63.6 %	1 537 KG



# Vegetable Matter

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- Burr



- Seed and shive



- Hardheads

11. VEGETABLE MATTER COMPOSITION

(B) 0.0

(S) 1.6

(H) 0.0



# Carding

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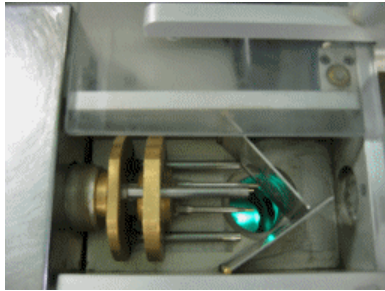


# Combing

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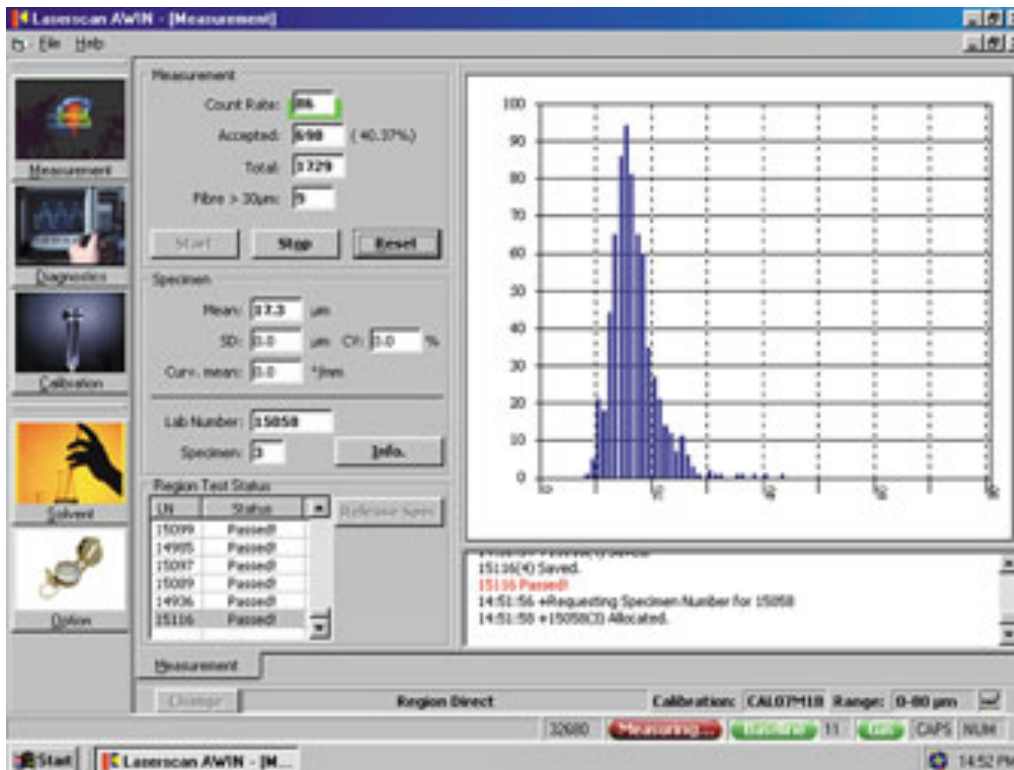


# Micron



- Average Fibre Diameter
- Determines 'end purpose'
- Significant influence on price
- Measured across four instruments
- 1000 snippets per instrument
- Results combined

# Micron



- Average Fibre Diameter
- CV Diameter
- Comfort Factor
  - Percentage < 30 microns
- Fibre Curvature



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## IWTO TEST CERTIFICATE (CONTINUED)

ORIGINAL

3-07858222-P2 \*CLASSED GROWER LOT

TEST METHOD IWTO-12

PAGE 2

AUSTRALIAN WOOL NETWORK PTY LTD MELBOURNE

13 BALES

% OF FIBRES

MIC	% COUNT
41	0.0500
42	0.0500
43	0.0250
44	0.0000
45	0.0000
46	0.0000
47	0.0000
48	0.0000
49	0.0500
50	0.0000
51	0.0000
52	0.0000
53	0.0250
54	0.0000
55	0.0000
56	0.0000
57	0.0000
58	0.0000
59	0.0000
60	0.0000
61	0.0000
62	0.0000
63	0.0000
64	0.0000
65	0.0000
66	0.0000
67	0.0000
68	0.0000
69	0.0000
70	0.0000
71	0.0000
72	0.0000
73	0.0000
74	0.0000
75	0.0000
76	0.0000
77	0.0000
78	0.0000
79	0.0000
80	0.0000

REF. M39M 101 297673

MIC % COUNT | : : : : | : : : : | : : : : | : : : : | : : : :

\*KOOLOMURT

05-	0.0250
06	0.0000
07	0.0250
08	0.0750
09	0.1000
10	0.4500
11	0.5500
12	1.5750
13	2.5000
14	4.3500
15	5.5250
16	8.1750
17	8.4000
18	10.8250
19	11.0000
20	10.8000
21	8.6000
22	6.9250
23	5.9500
24	4.0500
25	2.8250
26	2.4500
27	1.5500
28	0.7750
29	0.8500
30	0.4750
31	0.2750
32	0.2000
33	0.1000
34	0.0750
35	0.1250
36	0.0750
37	0.0500
38	0.0250
39	0.0250
40	0.0250

**SPECIMEN ONLY**

GROSS 2 442 KG TARE 26 KG  
NETT 2 416 KG

INSTRUMENT = LASERSCAN  
 SUB-SAMPLING METHOD = MINICORE  
 MEAN FIBRE DIAMETER = 19.5 MICRONS  
 SD OF DIAMETER = 4.2 MICRONS  
 CV OF DIAMETER = 21.5 %  
 COMFORT FACTOR = 98.8 %  
 NO. OF SPECIMENS = 4  
 NO. OF FIBRES MEASURED = 4000

THE FOLLOWING INFORMATION IS FOR APPRAISAL PURPOSES ONLY:

MEAN FIBRE CURVATURE = 64 DEG/MM

NO FURTHER PAGES



CERTIFIED QUALITY MANAGEMENT SYSTEM 1509001

The ORIGINAL and any OFFICIAL COPY of this Certificate are issued in accordance with the stated Test Method(s) and any directly associated Regulations. By authorising the application of the AWTA Ltd Seal, we hereby certify that the test results are within the precision limits of the Test Method declared. As far as is permissible by law, no other warranty is expressed or implied. On request, AWTA Ltd will make available sampling, weighing and/or testing details to any bona fide bearer or transferee of this Certificate. Photocopies and other reproductions are NOT recognised as Certificates. THIS CERTIFICATE SHALL BE RENDERED VOID IF AMENDED OR ALTERED.

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For and on behalf of Australian Wool Testing Authority Ltd

*[Signature]*  
MICHAEL A. JACKSON B.Sc. (Hons)  
MANAGING DIRECTOR

*[Signature]*  
DR. GEORG R. BEILHARZ Dip.App.Sc., M.Sc., Ph.D.  
GENERAL MANAGER - LABORATORY OPERATIONS



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# AUSTRALIAN WOOL TEXTILE TRAINING CENTRE

# Grab sampling

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# Display sample

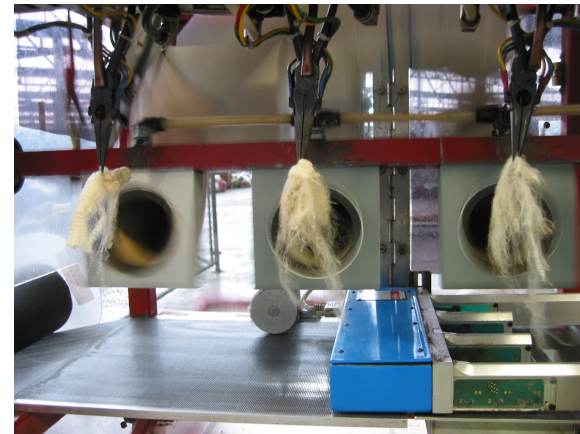


# Tuft sampling

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- Approximately 60 tufts at random





# Staple preparation

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- Approximately 60 staples
- One staple from each tuft
- Random

# ATLAS - Length

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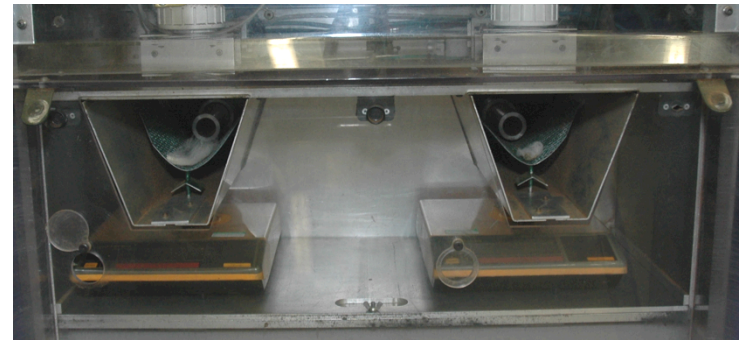
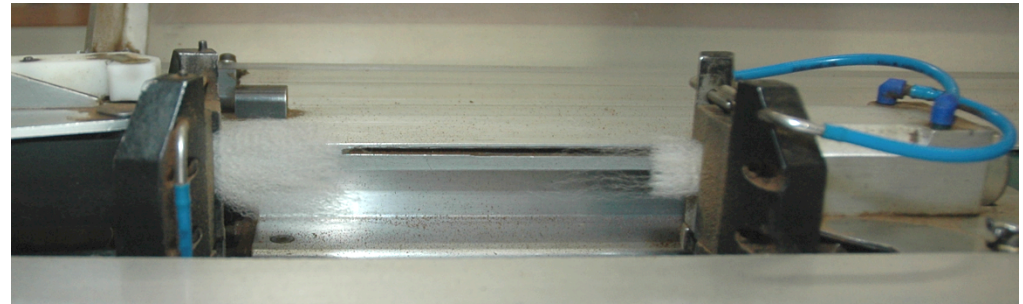
- Staple length



# ATLAS – Strength

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- Staple strength
- Position of break
  - Tip
  - Middle
  - Base



# TEAM formula



**T**RIALS  
**E**VALUATING  
**A**DDITIONAL  
**M**EASUREMENT



- *Hauteur* prediction formula
- Average fibre length in a wool top

# TEAM 3 formula

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$$H = 0.43L + 0.35S + 1.38D - 0.15M - 0.45V - 0.59CVD - 0.32CVL + 21.8$$

H = Hauteur

L = Staple Length

S = Staple Strength

D = Fibre Diameter

M = % Mid Breaks

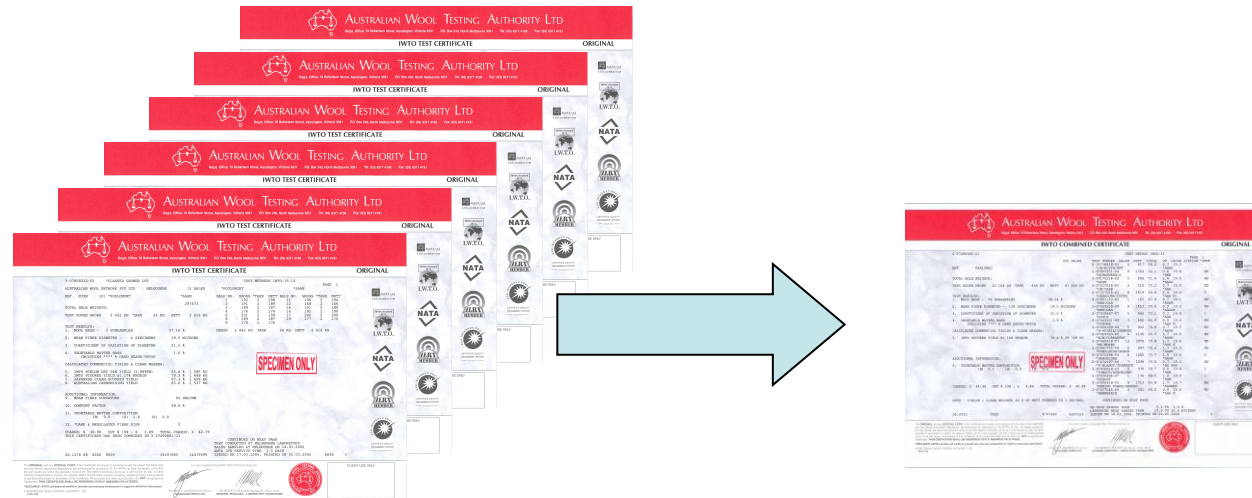
V = Vegetable Matter Content

CVD = CV Diameter

CV = CV Length

# Combined certificate

- Single certificate representing many
- Mathematically combined results
- Individual component results





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## IWTO COMBINED CERTIFICATE (CONTINUED)

ORIGINAL

2-07490881-J1

PAGE 1

225 BALES

REF. \_\_\_\_\_

TOTAL BALE WEIGHTS:

TEST HOUSE GROSS 42 104 KG TARE 450 KG NETT 41 654 KG

TEST RESULTS:

1. WOOL BASE - 70 SUBSAMPLES 58.24 %

2. MEAN FIBRE DIAMETER - 139 SPECIMENS 19.5 MICRONS

3. COEFFICIENT OF VARIATION OF DIAMETER 21.5 %

4. VEGETABLE MATTER BASE INCLUDING \*\*\*\* % HARD HEADS-TWIGS 1.0 %

CALCULATED COMMERCIAL YIELDS & CLEAN MASSES:

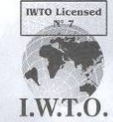
5. IWTO SCOURED YIELD at 16% REGAIN 70.4 % 29 308 KG

ADDITIONAL INFORMATION:

6. VEGETABLE MATTER COMPOSITION  
(B) 0.1 (S) 0.9 (H) 0.0

**SPECIMEN ONLY**

TEST NUMBER	BALES	NETT	YIELD	VM	LSCAN	AIRFLOW	*DMFR
2-07479703-P2	9	1704	65.7	2.0	19.6		ND
*MYLANDRA				*AAAA			
3-07759677-P7	3	393	70.4	0.3	19.6		ND
*MAERINA				*AAA M			
3-07774333-P8	5	869	72.2	0.6	19.2		ND
*CSD/HAZELDEAN				*AAAM			
3-07787005-P7	16	3123	78.2	0.2	19.7		ND
*ABBEY HILLS/JL				*AAAM			
3-07843674-P2	9	1743	76.6	0.9	19.8		ND
*ARUNDALE				*AAAM			
3-07847921-P3	3	596	77.2	0.5	19.6		ND
*KEEVUGA				*AAACOM			
3-07848239-P9	5	933	77.1	0.8	19.6		1
*T/PINES				*AAAM			
3-07849661-P3	16	3091	62.3	1.0	19.5		2
*ILLAWARRA				*AAAM			
3-07858222-P2	13	2416	69.7	1.6	19.5		2
*KOLOMURT				*AAAM			
6-05508063-P1	7	1325	74.7	1.2	19.2		
*WOODYARRUP				*AAAM			
6-05863278-P4	3	431	71.9	0.9	20.0		ND
*NUKERING				*AAAM			
6-05890895-P2	14	2789	73.3	0.7	20.0		ND
*GLENTONE / KOJ				*AAAM			
6-05918587-P3	6	1106	61.8	1.5	19.3		ND
*WANNERANOOKA				*AAAM			
6-05924151-P0	6	1009	66.7	1.3	19.6		ND
*WHITE GUM/VALLEY				*AAAM			
6-05932125-P4	8	1575	59.6	1.3	19.5		ND
*R & RP / EDENVALE				*AAAM			



CHARGE: \$ 44.40 GST @ 10% : \$ 4.44 TOTAL CHARGE: \$ 48.84

NOTE - YIELDS = CLEAN WEIGHTS AS % OF NETT ROUNDED TO 1 DECIMAL

CONTINUED ON NEXT PAGE

05.0930 0220 4747240 4697222

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For and on behalf of Australian Wool Testing Authority Ltd

MICHAEL A. JACKSON B.Sc. (Hons)  
MANAGING DIRECTOR

DR. GEORG R. BEILHARZ Dip. App. Sc. M.Sc. Ph.D.  
GENERAL MANAGER - LABORATORY OPERATIONS



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# AUSTRALIAN WOOL TEXTILE TRAINING CENTRE

# Certified data



AUSTRALIAN WOOL TESTING AUTHORITY LTD  
Regd Office: 76 Robertson Street, Kensington, Victoria 3021 PO Box 240, North Melbourne 3081 Tel: (03) 9271 4100 Fax: (03) 9271 4197

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**IWTO STAPLE TEST CERTIFICATE**
**ORIGINAL**

3-05473716-L2 TEST NETWORK 2M70-7.30 PAGE 1

THE BROOKS LTD. 2 BAGS \*TWO/ONE/BRAND \*AAAH AWTA (M)

REP: KEVIN 000123 \*TWO/ONE/BRAND

TOTAL BALE WEIGHTS: TEST HOUSE CROSS 241 KG TAKE 4 KG 202

TEST RESULTS:

1. MEAN STAPLE LENGTH - 66 STAPLES
2. COEFFICIENT OF VARIATION OF STAPLE LENGTH 12
3. MEAN STAPLE STRENGTH - 65 STAPLES
4. DISTRIBUTION OF POSITION OF BREAK:

BROKE IN THE TIP REGION 3

BROKE IN THE MIDDLE REGION 6

BROKE IN THE BASE REGION 3

ADDITIONAL INFORMATION:

CHARGE: 4 24.00 NET 9 12A 1 8 2.40 TOTAL C

33\_293908\_37375\_0269\_66\_32\_50\_356472666\_3314

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