

### What is Fibre Curvature?

Wool fibres typically have a wave or crimp pattern as illustrated below. Wool staple crimp can readily be seen in wools with good character. Even in wools with poor character or clarity of staple crimp, the individual fibres will generally have a crimped shape.

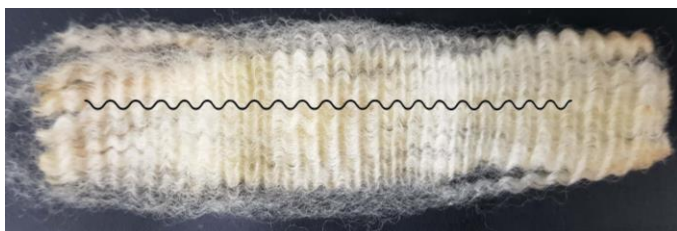
Fibre Curvature is a measure of the crimp in fibre snippets as determined by a LASERSCAN machine or by an OFDA instrument. It is expressed in units of degrees/mm.

### Traditional Crimp Frequency and Curvature measurements

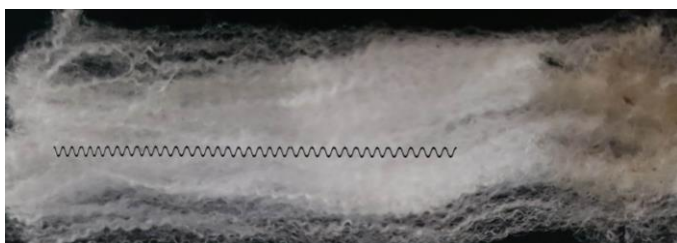
General examples of the relationship between curvature and crimp can be summarized as below.



30µm Crossbred fleece wool typically has a **Low Curvature (eg 40°/mm)** and a broad crimp. The crimp frequency is approximately **2 crimps/cm**.



20µm Merino fleece wool typically has a **Medium Curvature (eg 60°/mm)** and a medium crimp. The crimp frequency is approximately **4 crimps/cm**.



14µm Superfine Merino fleece wool typically has a **High Curvature (eg 74°/mm)** and a fine crimp. The crimp frequency is approximately **7 crimps/cm**.

### Calibration of Curvature Measurement

The measurement of curvature is directly related by how the instrumentation is calibrated. Within AWTA, all Laserscan and OFDA equipment is recalibrated regularly to ensure they are measuring as accurately as possible. This process uses internationally certified wool tops to adjust the instrument measurements back to a standard set of reference values. In this manner, Wool Testing Laboratories around the world ensure their instrumentation is standardized and measure correctly.

Recently, our Raw Wool Laboratories completed one of these biennial re-calibrations. Adjustments were made to all LASERSCAN, OFDA and Airflow instruments as required by the International Wool Textile Organisation, Interwoollabs and NATA as part of our ongoing accreditation requirements. The calibration wools included 2 new tops at 15.53 µm and 18.73 µm with associated curvature results of 80 and 69 °/mm respectively.

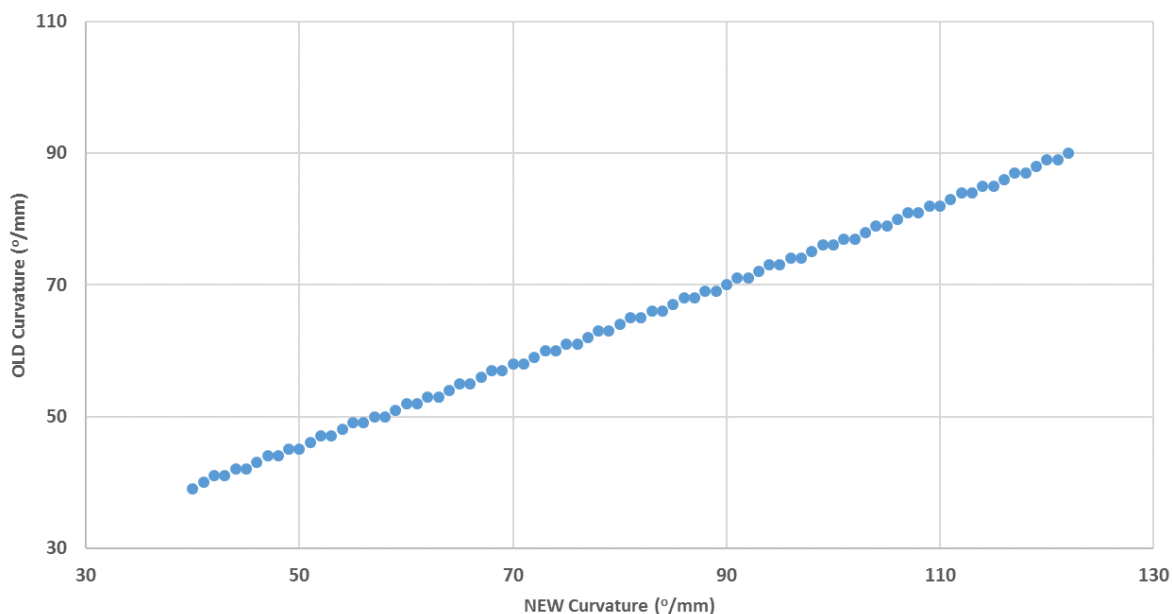
### Impact of Re-calibration on Tested Fibre Curvature Measurements

While there has been no change in the fibre diameter measurement results for LASERSCAN or OFDA we have seen a shift in the measurement of curvature where;

- Results for highly crimped wool, above around 85 °/mm, will be reported as a higher value due to the curvature correction AWTA must now apply, and
- The typical increase in the reported result is of the order of 25 °/mm, with the difference increasing as the measured curvature becomes higher.

## New versus Old Curvature Measurements

The graph and reference table below shows the relationship between the NEW and OLD Curvature data. The table can be used as a general conversion bareme.



NEW	OLD	NEW	OLD	NEW	OLD	NEW	OLD	NEW	OLD	NEW	OLD	NEW	OLD	NEW	OLD
40	39	50	45	60	52	70	58	80	64	90	70	100	76	110	82
41	40	51	46	61	52	71	58	81	65	91	71	101	77	111	83
42	41	52	47	62	53	72	59	82	65	92	71	102	77	112	84
43	41	53	47	63	53	73	60	83	66	93	72	103	78	113	84
44	42	54	48	64	54	74	60	84	66	94	73	104	79	114	85
45	42	55	49	65	55	75	61	85	67	95	73	105	79	115	85
46	43	56	49	66	55	76	61	86	68	96	74	106	80	116	86
47	44	57	50	67	56	77	62	87	68	97	74	107	81	117	87
48	44	58	50	68	57	78	63	88	69	98	75	108	81	118	87
49	45	59	51	69	57	79	63	89	69	99	76	109	82	119	88

## Effect on Crimp Frequency and Curvature measurements

Using the reference table above, the adjusted curvature readings on the traditional crimp types mentioned earlier can be summarized as below.

- A 30µm Crossbred fleece wool with a typically **Low Curvature is now ~41°/mm**
- A 20µm Merino fleece wool with typically **Medium Curvature is now ~74°/mm**; and
- A 14µm Superfine Merino fleece wool with a **High Curvature is now ~ 96°/mm**.

It is strongly recommended that users of curvature measurements take these changes into consideration when using the test data.

## Future Work

AWTA is working with Interwoollabs and other Raw Wool Laboratories around the world to refine the measurement of fibre curvature. A primary goal is that future calibrations re-establish the original relationship as soon as possible. Details will be provided when they are available.

## Related Information:

For further information please contact Mr. David Crowe by email [david.crowe@awta.com.au](mailto:david.crowe@awta.com.au)

## CONTACT Us

For more information on this service contact AWTA Raw Wool on:

**MELBOURNE LABORATORY:** +61 (0)3 9371 2100

[LAB.MEL@AWTA.COM.AU](mailto:LAB.MEL@AWTA.COM.AU)

**FREMANTLE LABORATORY:** +61 (0)8 9418 5333

[LAB.FRE@AWTA.COM.AU](mailto:LAB.FRE@AWTA.COM.AU)