FIBRE CURVATURE

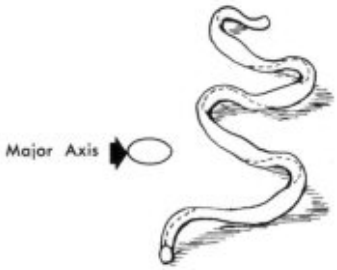

Fig. Three-dimensional crimp of wool fiber. (From G. E. Hopkins, *Wool as an Apparel Fiber*. Copyright by Holt, Rinehart and Winston, Inc.)

Work at the CSIRO and elsewhere has demonstrated that the curvature or crimp of a fibre has a second-order effect on spinning performance. There has therefore been a resurgence of interest in fibre crimp. Traditionally staple crimp was used as an indicator of wool quality, or as a rough guide to diameter, but it was shown that the relationship between crimp and diameter was fairly poor. In consequence, the use of crimp as an indicator for "quality" fell into disrepute in the objective measurement camp, but it was revived when work was carried out on trying to objectively determine factors relating to style, when crimp frequency and definition became parameters of interest.

Currently both OFDA and Laserscan instruments provide a measurement of mean fibre curvature Info-bulletin 5.5 provides information on wool fibre curvature, whereas Info-bulletin 5.13 discusses measurements on alpaca fibres. However, currently there is no agreed method to calibrate instruments for this parameter, and some large differences have been observed between individual instruments and between laboratories. Research has served to highlight many of

the problems, including the fact that the measurement is influenced by virtually all processing stages of the fibre (whether in the laboratory or commercially). SGS has contributed in a number of ways to this work and indicated one promising method of calibration (see Technical publications). Interwoollabs has recently been collecting data on curvature measurement on IH calibration tops, and there are now promising signs that curvature calibration might become feasible. Whilst of significant interest to researchers and in some very specific applications, our current advice is that the measurements must be treated with caution until the measurements are fully standardised.

The Laserscan and OFDA use different mechanisms for measuring curvature. In the Laserscan, the curvature of each fibre snippet is assessed based on which pair of 16 fibre optic detectors arranged in a circle is occluded by the snippet. The curvature value can therefore only be assigned to a limited number of bins. The accuracy of the measurement must presumably be limited by the geometrical accuracy with which the discriminators can be assembled during manufacture. A further complication is that water may now be used instead of a propanol-water mix in the Laserscan, and this may result in a further systematic shift in curvature values from this instrument.

The OFDA assesses the curvature of individual snippets by measuring the geometry of an arc in the fibre image. Results are assigned to as many 1 deg/mm bins as necessary, and as many bins as are needed are used (up to maximum of 359). The higher resolution of the OFDA measurement allows the standard deviation of curvature to be calculated, but opinion is divided on the use that can be made of this measurement

FOR ENQUIRIES

Email us at NZ.wool@sgs.com
Or contact us at:
48 Kemp Street, Kilbirnie
PO Box 15062
Wellington, New Zealand
Tel: +64.4.387.8565
Fax: +64.4.387.8651