

# Wool Testing Services Info-bulletin

## Airflow, OFDA and Laserscan

### Fibre diameter certification

Traditionally, mean fibre diameter of greasy and scoured wool was for many years certified using the airflow test method (IWTO-28) in the southern hemisphere grower countries. Processors used airflow (IWTO-6) or projection microscope (IWTO-8) to measure diameter of tops & slivers (see Info-bulletin 3.1).

In the last decade this situation changed with the introduction of the OFDA Sirolan-Laserscan instruments. These measure both mean fibre diameter and distribution of diameter using modern techniques.

The newer instruments have been rapidly adopted over the last few years in all parts of the wool industry, from fleece testing through to top and yarn measurement. There are now over 150 OFDA instruments in use in 22 countries. In 1995 both instruments were accepted by IWTO for raw wool and tops certification using the test methods IWTO-47 (OFDA) and IWTO-12 (Laserscan).

### Differences between methods

The projection microscope is still regarded as the reference method for wool and animal fibres. The width of projected images of individual fibre snippets are allocated to diameter classes, and after at least 600 snippets have been measured by at least 2 operators, the mean diameter can be calculated.

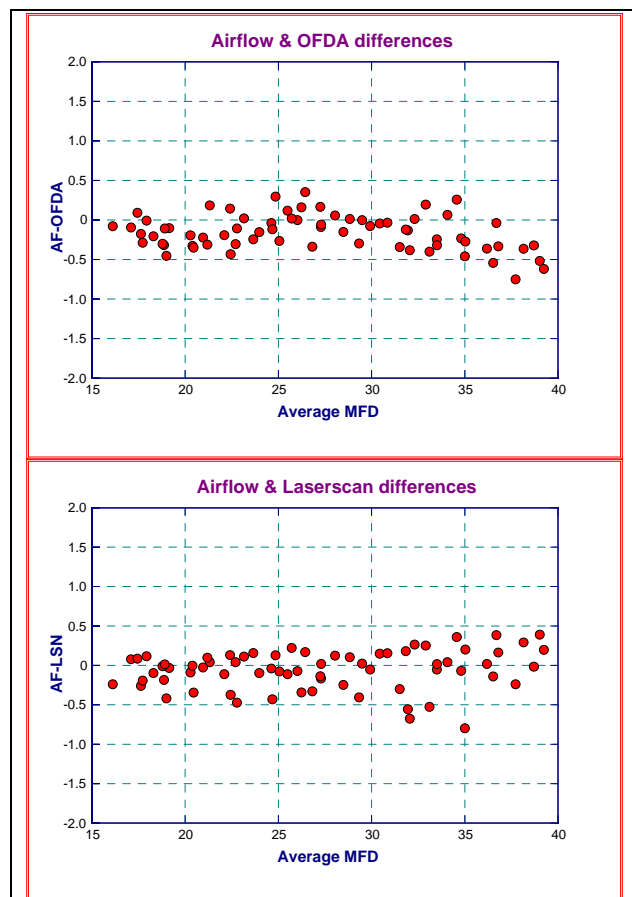
The airflow method is empirical. Mean fibre diameter is indicated by the rate of flow of air, at a fixed pressure, through a 2.5g mass of fibre compressed in a fixed volume. Each instrument is calibrated using internationally agreed calibration tops, whose nominal values are fixed after several international round trials using both airflow and the projection microscope.

The two newer instruments work in a similar manner to the projection microscope by measuring the width of fibre snippet images, although by highly automated methods. Whilst the details of measurement are different, both instruments allocate snippet widths to diameter classes, and the mean fibre diameter is calculated from at least 2000 snippets in the case of the OFDA, and 1000 snippets in the case of the Laserscan.

### Differences between results

In 1995 two international round trials were organised in which 4 laboratories measured 40 raw wool samples by airflow, OFDA and Laserscan; and 16 laboratories participated in a trial in which 30 top samples were measured. The outcome from both trials was similar, and the combined results are shown in the two graphs following.

It can be seen that on average both of the newer instruments gave similar results to the airflow, but that on specific wools, differences of up to 0.5 micron were observed between the new methods and airflow. (Similar conclusions could be drawn when



**Combined grand mean differences data from the 1995 IWTO AF-OFDA-Laserscan round trial**

the results were compared to projection microscope measurements.)

The reasons for the individual differences are a combination of natural measurement variability, and minor differences arising from differences in the physical principles used in each system. However, it should be noted that the level of variability shown above is no greater than would be found between airflow measurements carried out on two samples of wool in different laboratories.

In due course we expect that most measurements of fibre diameter will be made with the new instruments. IWTO has accepted that for **tops and slivers** the two new systems give similar mean fibre diameter results. However, IWTO has not allowed results from the different methods to be combined on one certificate, and continues to stipulate that retests must be carried out using the same test method as was used for certification.

The situation with **raw wool** is slightly different. In Australia, South Africa, and in New Zealand for merino wools, Laserscan measurement under IWTO-12 has now become the default.