

# Wool Testing Services Info-bulletin

## OFDA 100

### What is OFDA?

OFDA stands for Optical Fibre Diameter Analyser. The instrument was initially developed in Australia in the early 1990's. It is essentially an automated microscope specifically designed to measure fibre snippets spread over a glass slide at upwards of 2000 measurements/minute.

Whilst SGS has had significant input to the standardisation processes connected with OFDA, they have no commercial involvement with the manufacture or supply of the equipment.

The original OFDA 100 was solely a laboratory instrument. A newer model operating under Windows 98<sup>®</sup>, the OFDA 2000, has been available since 2000. This is also capable of measuring greasy wool in staple form on-farm.

### OFDA diameter measurements

The OFDA was designed to provide a rapid, precise and accurate measurement of the mean fibre diameter and fibre diameter distribution of samples of wool.

In order to perform this function, 2 mm snippets of representative subsamples of clean fibre are spread over a large microscope slide. The slide is placed on the OFDA stage, where it is rapidly moved through the field of view of a low-powered microscope. At each slide position a video system captures an image which is then analysed in real time to detect and measure fibre image widths. The image widths are converted to diameter measurements via a calibration equation derived from measurements on the industry-standard IH wool calibration tops, or the IMA standard tops for mohair.

The measurement system has been standardised for wool and other animal fibres, and the test method is documented in IWTO-47, which was ratified by IWTO in Dec. 1995.

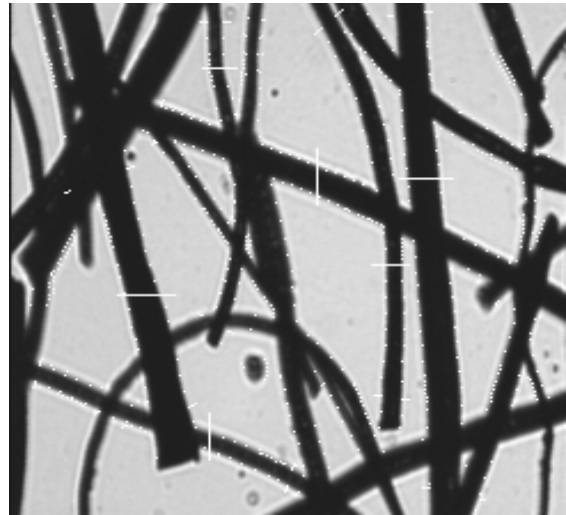
### OFDA medullation measurements

Early in 1994 it was announced that the OFDA, with some modification, could be used to measure fibre opacity, from which medullation can be estimated.

Medullated fibres are those where the core of the fibre contains air and are consequently opaque. Whilst this can produce desirable effects for some uses, on the whole medullation is seen as a fault for garment end-uses, since medullated fibres do not take dye in the same manner as normal fibres.

Medullation is traditionally measured using the projection microscope. The method is slow and often relatively inaccurate. Alternative systems have been developed by WRONZ, including the medullameter and a method based on near infra-red analysis (NIRA). Neither technique has been widely used.

Interest in the use of OFDA for medullation measurement was driven from both South Africa (where users wanted a rapid method for measuring "objectionable medullated fibres" in mohair, at levels of a few parts per 10,000), and from New Zealand, which needed a rapid method for assessment of crossbred wools.



Typical OFDA image with measurement points

International round trials were carried out, and in consequence there is now an IWTO test method (IWTO-57) available. There are, however, no applicable sampling regulations, so medullation results cannot yet be certified.

### OFDA curvature measurements

At the same time as the medullation system was being developed, software was also made available to allow the OFDA to measure fibre curvature.

Fibre curvature is a measure of fibre crimp, which is closely related to staple crimp. Crimp has been shown to be an important factor in the "spinnability" of wool, as well as an indicator of "handle" or bulk.

Bulk is seen as an important parameter by many spinning mills, although to date there has been a disappointing take-up of the core bulk test, which has been available in New Zealand for some time. This interest was confirmed when SGS presented an introductory paper on the use of OFDA for estimating bulk at the 1996 Capetown IWTO conference.

There is still some way to go on standardising the sample preparation methods for measuring bulk by OFDA, but the proposal looks very promising. Such a method would offer savings over the current test method, which requires considerable care and a significant amount of time for sample preparation.

### OFDA Along-fibre measurements

A later addition to the OFDA software has been the Along-fibre menu. This includes measurement of along-fibre variation in diameter, as well as two measures of "blobs". The "blobs" are measures of non-uniform profile asperities and adhering matter. They have been shown to be useful in predicting extractable matter content, and are therefore indicative of fibre cleanliness. This suit of measurements has also been used in discriminating between different types of fibres, and preliminary work has been done on estimating fibre mixture composition (eg. wool-cashmere).