

Australian/New Zealand Standard™

Wool—Fleece testing and measurement

Method 5: Measurement of mean fibre diameter using the OFDA measuring system

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TX/12, Wool to supersede AS/NZS 4492.5(Int):1997.

This Standard is based on the method of testing core samples using an OFDA instrument in IWTO 47-95, *Determination of the mean and distribution of fibre diameter of wool using an Optical Fibre Diameter Analyser (OFDA)*. Attention is drawn to the introduction to this series of fleece testing methods in Part 0.

The measurements should be regarded as relative, not absolute values, and they should only be used for within-flock comparisons.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

METHOD

1 SCOPE This Standard sets out a procedure for obtaining the mean fibre diameter, and in some cases the fibre diameter distribution, of a sample of fleece wool. The procedures also include requirements for drawing subsamples and preparing test specimens.

2 OBJECTIVE The objective of this Standard is to provide the wool industry with a method of determining mean and distribution of fibre diameter by OFDA for the purpose of ranking sheep or classing fleeces according to mean fibre diameter.

3 DEFINITIONS For the purpose of this Standard the definitions below apply.

3.1 Snippet sample—all of the fibre snippets cut from a subsample that have been cleaned where necessary.

3.2 Test specimen—the portion of the snippet sample spread over the glass slide ready for measurement.

4 PRINCIPLE Short snippets of fibres are dispersed onto a glass slide and measured on an OFDA. The snippets are cut from the subsample using a minicorer. The fibres may be cleaned either before or after minicoring.

The instrument is calibrated using a set of Interwoollabs standard tops*, the snippets being taken using the same method as that used for the laboratory samples.

5 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

2001 Methods of test for the textiles

2001.1 Part 1: Conditioning procedures

AS/NZS

1133 Wool—Determination by the Airflow Method of the mean fibre diameter of core samples of raw wool

4492 Wool—Fleece testing and measurement

4492.2 Method 2: Determination of washing yield and clean fleece weight

4492.4 Method 4: Measurement of mean fibre diameter and determination of fibre diameter distribution using the SIROLAN-LASERSCAN measuring system

IWTO

12 Measurement of the mean and distribution of fibre diameter using the SIROLAN-LASERSCAN fibre diameter analyser

47 Determination of the mean and distribution of fibre diameter of wool using an Optical Fibre Diameter Analyser (OFDA)

52 Conditioning procedures for testing textiles

6 APPARATUS The following apparatus is required:

- (a) An Optical Fibre Diameter Analyser (OFDA) instrument in accordance with IWTO 47. If the standard deviation is reported, the instrument shall be operated with Version 2 or later of the software.
- (b) A minicorer with a cutting diameter of 1.8 to 2.0 mm for cutting fibre snippets. A typical minicorer is described in IWTO-12.

NOTES:

- 1 A minicorer is required rather than a guillotine to cut snippets, as the use of a guillotine will result in the selection of snippets which are representative of the location of the site from where they were taken, instead of being representative of the whole sample.
The guillotine is normally used for research purposes, e.g. to measure the fibre diameter changes along the staple.
- 2 Snippet lengths appreciably shorter than 1.8 mm or longer than 2.0 mm may give biased results.
- (c) A device to distribute a representative selection of snippets randomly over a slide.
- (d) Microscope slides, of float glass, sufficiently robust to withstand repeated handling.
NOTE: Slides that have scratch marks on the sides which are in contact with the fibres are unsuitable for use under this method as they will lead to erroneous measurement.

* The Interwoollabs IH standard tops comprise eight specially-prepared dry-combed reference slivers from which samples have been measured by many member laboratories using Airflow apparatus and using projection microscope in repeated round trials. Further details can be obtained from the Interwoollabs Secretariat, Boite 14, Rue du Luxembourg 19/21, 1040 Brussels, Belgium.

- (e) Means of producing and maintaining a laboratory atmosphere with minimal changes in temperature ($\pm 2^{\circ}\text{C}$) and relative humidity ($\pm 3\%$), e.g. as described in IWTO-52 and AS 2001.1.

NOTE: Where the atmosphere conditions deviate from the standard atmosphere of 20°C and 65% RH but have remained within the limits over the period of conditioning and measurement, correction factors as set out in AS/NZS 1133 should be applied.

7 CALIBRATION The OFDA instrument shall be calibrated according to the procedures described in IWTO-47. The calibration shall be verified as described in IWTO-47.

NOTE: Snippets prepared from standard tops should be prepared by the same method used to prepare samples (see Clause 6(b)).

8 SAMPLE PREPARATION

8.1 General If the sample requires scouring, the method for scouring set out in AS/NZS 4492.2 shall be followed.

8.2 Atmospheric conditions If an aqueous scoured and dried subsample is to be measured, the subsample shall be brought to equilibrium in the laboratory atmosphere (see Clause 6(e)) and tested in this atmosphere.

NOTES:

- 1 Each laboratory should determine the time interval for equilibrium applicable to their laboratory atmosphere.
- 2 For a well-opened subsample to obtain equilibrium in a well-ventilated room, a minimum of 4 h exposure is considered necessary.

8.3 Snippet preparation The following shall apply:

- (a) One subsample with an approximate mass of 10 g, shall be drawn so as to be representative of the midside sample. Where the available material has a mass of less than 10 g, the subsample shall comprise the whole sample.
- (b) Take one snippet sample by placing the subsample in the minicorer. If the whole subsample cannot be accommodated in the minicorer, select a representative portion of suitable mass for the machine and minicore this portion.
- (c) If the sample has not been scoured in accordance with Clause 8.1 above, proceed as above, but placing the greasy sample in the minicorer. Clean the test specimen of grease and extraneous matter including fibre fragments released during snippet preparation. A suitable method is defined in Appendix A.
- (d) Take sufficient snippet samples to ensure that the test specimen is of sufficient size to ensure that at least 2000 snippets can be measured.

8.4 Preparation of the test specimen The following shall apply:

- (a) Any snippet sample minicored directly from greasy wool (i.e. not prepared from wool which has been scoured in accordance with Method 2), shall be cleaned in accordance with Appendix A and dried in an oven at between 70°C and 105°C for at least 10 min, and then conditioned to equilibrium in a constant atmosphere for a minimum of 4 h.
- (b) If necessary, clean each surface of each glass slide pair by wiping with a lintless swab moistened with alcohol. Care shall be taken at all times to avoid leaving fingerprints or other deposits or scratches on the glass slides, since this may lead to either focusing difficulties or measurement inaccuracies. Any slides that are scratched shall be tested without fibres and where readings are observed, the slides shall be discarded. Avoid letting alcohol come into contact with the adhesive holding the hinge between the pair of slides.

NOTE: See Appendix B for examination for spurious diameter readings.