AS 2720—1984

Australian Standard®

WOOL—MEASUREMENT OF MEAN STAPLE LENGTH—METHOD USING THE CSIRO STAPLE LENGTH METER

This Australian standard was prepared by Committee TX/12, Testing of Wool. It was approved on behalf of the Council of the Standards Association of Australia on 6 May 1984 and published on 2 July 1984.

The following interests are represented on Committee TX/12:

Australian Council of Wool Buyers

Australian Wool Corporation

Australian Wool Testing Authority Ltd

CSIRO, Division of Textile Physics

Department of Defence

Department of Primary Industry

National Council of Wool Selling Brokers of Australia

University of New South Wales

Wool Council of Australia

Wool Textile Manufacturers of Australia

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PREFACE

This standard was prepared by the Association's Committee on Testing of Wool under the direction of the Textile Standard Board. It has been prepared for the purpose of standardizing practices for the measurement of staple length of greasy wool. The sampling is detailed in AS 1363 and the subsampling operation is detailed in AS 2721, one of three standards relating to the sampling and measurement of staple length and staple strength.

The definition of staple length can be subject to different interpretations and methods for the objective measurement of this length may differ. The standard defines staple length as a result of a measurement by the CSIRO Staple Length Meter. The staple length is the projected length along the staple axis of the outline of an unrestrained staple. This standard details the measurement procedure and describes a suitable staple length measurement device.

The other standards in the series are as follows:

AS 1133	Method for the Determination of Fibre Diameter of Raw Wool*
AS 1134	Method for the Determination of Wool Base and Vegetable Matter Base in Raw Wool
AS 1363	Wool—Grab Sampling of Greasy Wool*
AS 1401	Method for the Sonic Fineness Testing of Raw Wool*
AS 1809	The Preservation of the Integrity of Raw Wool Samples for Display
AS 1980	Wool—Core Sampling of Raw Wool in Bales
AS 2104	Matching and Building Sales Lots of Greasy Wool in Bales by Objective Measurement
AS 2274	Wool—Requirements for the Issue of a Test Certificate*
AS 2721	Wool—Method for Subsampling of Stables from Grab Samples
AS 2722	Wool—Determination of Mean Staple Strength—Method Using the CSIRO Staple Strength Meter†
AS YYYY	Wool—Method for the Measurement of the Colour of Wool†

* In course of revision

† In course of preparation

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
WOOL—MEASUREMENT OF MEAN STAPLE LENGTH—METHOD USING THE CSIRO STAPLE LENGTH METER

1 SCOPE. This standard sets out a method using the CSIRO staple length meter for measurement of unrestrained staple length of greasy wool which is suitable for combing. An estimate of the precision of the method is given in Clause 9.

2 APPLICATION. The method is applicable to staples drawn in accordance with AS 2721, including any second cut staples.

The method may also be applied to staples drawn in any other way. However, the precision of the measurement will depend upon the method of drawing the staples, the number of staples drawn and measured, and, if the value is to be referred to the bulk, then the method of obtaining the sample will affect the precision.

The method is not applicable to greasy wool suitable solely for carding because such types include wool with poorly defined staples. The method is not applicable to raw wool in other forms.

3 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1363 Wool—Grab Sampling of Greasy Wool

AS 2721 Wool—Subsampling of Staples from Grab Samples.

4 DEFINITIONS. For the purpose of this standard, the following definitions apply:

4.1 Greasy wool—unprocessed wool from sheep or wool shorn from sheepskins.

4.2 Grab sample—the greasy wool drawn from a bale by a single operation of a grab machine in accordance with AS 1363.

4.3 Sample—the combined grab samples representative of the wool in a lot drawn in accordance with AS 1363.

4.4 Second cut—a staple resulting from a second attempt to shear wool from the sheep.

NOTE: It differs from a normal staple in that both ends are severed and no tip-end is evident.

4.5 Staple—a well-defined bundle of fibres which has been removed from the greasy wool as a unit. Second cuts (see Clause 4.4) are considered as staples.

4.6 Staple axis—an imaginary straight line along the staple in the direction of the majority of fibres.

4.7 Staple length—the projected length of the outline of an unrestrained staple, as measured along its axis by the CSIRO staple length meter (see Fig. A1).

5 PRINCIPLE. The unrestrained lengths of a number of staples, including second cuts if any, drawn from samples of greasy wool are measured. The mean staple length, and its distribution parameters are calculated from the data.

6 APPARATUS.

6.1 CSIRO staple length meter. A staple length meter, described in Appendix A, consisting of the following:

(a) A conveyor belt with a flat smooth surface for transporting the selected test staples in the direction of the staple axis past an optical detection system.

(b) An optical detection system consisting of a vertical array of light sources (light emitting diodes) on one side of the conveyor belt and an equivalent array of photo-detectors on the other side of the belt.

(c) A pulse generator actuated by an optical detection system, set to deliver a pulse for each 1 mm travel of the conveyor.

6.2 Check gauges. A series of gauges of known lengths used to check the accuracy of the CSIRO staple length meter. The gauges should represent the range of staple lengths to be measured.

6.3 Conditioning. A means of producing a standard atmosphere (20 ± 2°C, 65 ± 2 percent r.h.).

7 PROCEDURE.

7.1 Preparation. Prepare the staples drawn in accordance with AS 2721 by allowing the staples to relax unrestrained in a standard atmosphere for at least 24 h prior to measurement.

7.2 Measurement. Before any series of measurements is made, carry out the premeasurement checks detailed in Paragraph A3 of Appendix A, to ensure that the staple length meter is accurate to within 1 mm.

(a) Make all measurements in the standard atmosphere of 20 ± 2°C, 65 ± 2 percent r.h.

(b) Switch on the meter.

(c) Place each staple on the conveyor with its axis as nearly as possible parallel to the direction of travel and near the middle of the conveyor.

(d) Place staples at least 10 mm apart in order to measure them individually.

(e) When a staple passes between the optical detection system, the length of the staple is displayed on the meter. Record the length of each staple measured.

(f) Record the number of staples.

(g) Calculate and record the mean staple length to the nearest 1 mm.

(h) Calculate the coefficient of variation of the staple lengths measured and record it to the nearest 1 percent.

8 REPORT. Report the following:

(a) Mean staple length, to the nearest 1 mm.

(b) Coefficient of variation of staple length (CVSL) to the nearest 5 percent.

(c) Number of staples measured.