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AS 2810—1991

Australian Standard®

Wool—Measurement of mean staple length and mean staple strength

STANDARDS AUSTRALIA

This Australian Standard was prepared by Committee TX/12, Testing of Wool. It was approved on behalf of the Council of Standards Australia on 28 February 1991 and published on 15 April 1991.

The following interests are represented on Committee TX/12:

Australian Council of Wool Exporters

Australian Wool Corporation

Australian Wool Testing Authority

CSIRO, Division of Wool Technology

Department of Defence

National Association of Testing Authorities Australia

National Council of Wool Selling Brokers of Australia

University of New South Wales

Wool Council of Australia

Wool Scourers and Carbonizers Association of Australia

Wool Textile Manufacturers of Australia

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PREFACE

This Standard was prepared by the Standards Australia Committee on Testing of Wool under the direction of the Textile Standards Board, to supersede AS 2810—1985, *Wool—Determination of mean staple length and mean staple strength.*

In this edition, the references to the coefficient of variation and the standard deviation of staple strength have been omitted. The reason for this is that, in the determination of linear density, the mass of the greasy staples measured by the instrument is corrected by the average values of wool base and vegetable matter base for the sale lot. This approach has been shown to give correct values for the average staple strength of a lot but it does not give correct values when applied to individual staples. Hence, an unbiased estimate of the standard deviation or coefficient of variation of staple strength cannot be obtained for a lot. A method of calculating the position of break of a consignment has been included in this edition.

This Standard is one of a series of Standards for the sampling and testing of wool. The other Standards in the series are as follows:

AS

1133 *Wool—Determination of the mean fibre diameter of raw wool*

1134 *Method for the determination of wool base and vegetable matter base in raw wool*

1362 *Wool—Method for the calculation of combined test certificates for yield and fineness of raw wool in consignments*

1363 *Wool—Grab sampling of greasy wool*

1809 *The preservation of the integrity of raw wool samples for display*

1980 *Wool—Core sampling of raw wool in bales*

2274 *Wool—Requirements for the issue of a test certificate for raw wool*

2720 *Wool—Measurement of mean staple length—Method using the CSIRO staple length meter*

2721 *Wool—Method for subsampling of staples from grab samples*

3546 *Wool—Method for the measurement of average yellowness of greasy wool*

CONTENTS

FOREWORD

The measurement of staple length and staple strength of wool may be used in conjunction with other objective measurements to assess potential worsted processing performance.

There are a number of methods available for the measurement of staple length. These differ in their methods of detecting the ends of the staple and the tension or constriction placed on the staple during measurement. For these reasons the measurements result in different values of staple length although most of these are interrelated.

This measurement of staple strength differs from other tensile tests on fibre bundles in that it is not a measure of the intrinsic strength of the material. This test determines the force required to break the staple at its weakest position, which is usually the point of minimum cross-sectional area. The measurement of position of break in a staple is the method of describing this position.

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Wool—Measurement of mean staple length and mean staple strength

1 SCOPE This Standard sets out a method for the measurement of mean staple length, mean staple strength and position of break of greasy wool suitable for worsted processing.

2 APPLICATION The method is applicable to staples of greasy wool drawn in accordance with AS 2721. An estimate of the precision of the method is given in Clause 9.

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, the method of obtaining the sample.

The method is not applicable to short greasy wool suitable solely for woollen processing or to raw wool in other forms.

In determining mean staple strength, the method can only be applied to staples of sufficient length and thickness to be gripped in the two sets of jaws used in the measuring instrument.

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

AS
1363 Wool—Grab sampling of greasy wool

2001 Methods of test for textiles
2001.1 Part 1: Conditioning procedures

2720 Wool—Measurement of mean staple length—Method using the CSIRO staple length meter

2721 Wool—Method for subsampling of staples from grab samples

4 DEFINITIONS For the purpose of this Standard, the definitions below apply:

4.1 Average linear density—the clean staple mass per unit staple length at standard conditions.

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

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

4.4 Position of break—an indication of where a staple breaks during extension, determined by comparing the masses of wool in the broken portions of the staple.

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

4.6 Second cut—a short staple resulting from a second attempt to shear wool from the sheep. It differs from a normal staple in that both ends are severed and no tip end is evident.

NOTE: Second cuts are included as staples (see Clause 4.7).

4.7 Staple—a well-defined bundle of fibres which has been removed from the greasy wool as a unit. It includes second cuts.

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

4.9 Staple length—the projected length of the outline of an unrestrained staple, as measured along its axis.

4.10 Staple strength—the maximum force of rupture per unit of average linear density.

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

The strengths of the same staples are measured. The mean staple strength and the position of break are calculated from the data.

6 APPARATUS

6.1 A means of measuring staple length—which gives results that are equivalent to those obtained by the method described in AS 2720.

NOTE: An instrument meeting this requirement is described in Appendix A.

6.2 A staple strength measuring instrument—which consists of—

(a) jaws for gripping the ends of a staple without damage or slippage;

(b) a means for extending a staple, gripped at both ends, at a rate of 50 mm/s to 300 mm/s;