AS 3546—1996

Australian Standard®

Wool—Method for measuring average yellowness of raw wool

This Australian Standard was prepared by Committee TX/12, Testing of Wool. It was approved on behalf of the Council of Standards Australia on 4 April 1996 and published on 5 August 1996.

The following interests are represented on Committee TX/12:

Australian Council of Wool Exporters
Australian Wool Exchange
Australian Wool Processors Council
Australian Wool Research and Promotion Organisation
CSIRO—Division of Wool Technology
Department of Defence, Australia
Lincoln University, New Zealand
National Association of Testing Authorities, Australia
National Council of New Zealand Wool Interests
New Zealand Council of Wool Exporters
New Zealand Wool Board
New Zealand Wool Brokers Association
Telarc, New Zealand
Testing Interests, Australia
Testing Interests, New Zealand
University of New South Wales
Wool Council of Australia
Wool Research Organization of New Zealand
Wool Scourers and Carbonisers Association of Australia

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TX/12 on Wool to supersede AS 3546—1988 *Wool—Method for the measurement of average yellowness of greasy wool*. It sets out a method to be used to measure average yellowness of samples of raw wool prepared for mean fibre diameter measurement in accordance with AS/NZS 1133 *Wool—Determination by the airflow method of the mean fibre diameter of core samples of raw wool*. The method is not suitable for identifying the contamination by individual coloured fibres.

This Standard is the result of a consensus among representatives on the Joint Committee to produce it as an Australian Standard.

The revision of AS 3546 was needed to enable combination certificates to be calculated and to allow 'as is' colour to be determined.

Because of the difficulties in defining preparation procedures for the measurement of both lightness and yellowness of cleaned greasy wool, this Standard for measuring yellowness only has been produced. The lightness value of wool is needed to calculate average yellowness in combination certificates, but is not reported on individual test certificates. However, it is hoped that further research work will resolve these difficulties and allow a more complete specification of the colour of wool.

The method describes the preferred apparatus for the measurement. A statement on the precision of the method is given.

This Standard is one of a series of Standards for the sampling and testing of wool.

The term 'normative' has been used in this Standard to define the application of the appendix to which it applies. A 'normative' appendix is an integral part of a Standard.

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Originated as AS 3546—1988.
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FOREWORD

It is difficult for the human eye to make reliable quantitative assessments of colour and there can be considerable variability in the degree of accuracy with which observers detect differences in colours. Moreover, colour differences which are easy to see when the objects are side-by-side, are very much harder to assess when the objects are separated by time or distance. An objective measurement of colour is therefore desirable.

A complete measurement of the colour of an opaque material such as wool is obtained by measuring the proportion of light reflected from its surface throughout the visible spectrum. It is, however, possible to obtain useful information by measuring the reflection in the red, green and blue regions. Under the conditions specified by the International Commission of Illumination (C.I.E.)*, these three readings are referred to as the tristimulus values *X* (red), *Y* (green) and *Z* (blue). The values provide sufficient information to describe colour for the specified light source and viewing conditions. They can be used directly, or they can be transformed, to provide information concerning particular aspects of colour.

The colour of wool is influenced, not only by its inherent colour, but also by the grease, suint, dirt, vegetable matter and other impurities present. The colour of the cleaned wool is usually of interest since most of these impurities are removed during processing and generally do not affect the colour of the final product. This Standard relates to a measurement on the laboratory sample prepared for mean fibre diameter measurement according to AS/NZS 1133. For greasy wool a core sample is scoured and carded to remove most of the contaminants that will ultimately be removed during processing.

The base colour measurement of either greasy wool core samples or commercially scoured wool is an attempt to determine the inherent colour of the wool. The ‘as is’ colour (as defined) when compared with base colour, is an indicator of the effectiveness of commercial scouring.

In this Standard only the aspect of yellowness is addressed, although in combination certificates, both the *Y* and *Z* values of individual components are needed. *Y* represents the lightness of the sample. Yellowness relates to the relative intensities of reflectance in the green and blue regions of the spectrum. The yellowness index given by this Standard is derived from the tristimulus values *Y* and *Z* as *Y-Z*. As an illustration of the range of this parameter for wool, the following values are given:

Colour description	*Y-Z units*
Very white	-2
White	0
Creamy	3
Canary yellow stain	12

Wool colours which are not well identified solely by yellowness measurement include brown, black and green.

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* CIE—Commission Internationale de l’Eclairage. See CIE Publication No 15 (E—1.3.1) 1971.

STANDARDS AUSTRALIA

Australian Standard

Wool—Method for measuring average yellowness of raw wool

1 SCOPE This Standard sets out a method for measuring the average yellowness of a sample of raw wool cores taken from a lot by the method described in AS 1980. The procedures to be used to clean and prepare the sample prior to measurement are those set out in AS/NZS 1133 and are not described in this Standard.

2 OBJECTIVE The objective of this Standard is to provide the wool industry with an average yellowness measurement of greasy or scoured wool to indicate its processing potential.

3 APPLICATION The method is applicable to the determination of the average yellowness of greasy wool prepared for mean fibre diameter measurement in accordance with AS/NZS 1133. This is the base yellowness result after cleaning, drying and carding. The method may also be used to determine the 'as is' yellowness of commercially scoured wool which may have been dried for a condition test in accordance with IWTO-33. Preparation procedures (e.g. drying and exposure to UV light) are known to influence wool colour.

The method is not suitable for the detection of contamination by pigmented, urine-stained or coloured wools, e.g. brown, black or green. The method is suitable for measuring colour in scoured wool containing urine-stained fibres.

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

AS
1980 Wool—Core sampling of raw wool in bales

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

AS/NZS
1133 Wool—Determination by the airflow method of the mean fibre diameter of core samples of raw wool

IWTO
33 Method for the determination of oven-dry mass and calculated invoice mass of scoured and carbonised wool

5 PRINCIPLE Test specimens are drawn from the prepared sample and arranged so as to present a flat surface to the measuring instrument. The CIE tristimulus values Y and Z are measured, and the yellowness is reported as $Y - Z$.

6 DEFINITIONS For the purpose of this Standard, the definitions below apply.

6.1 'As is' colour—the colour of the wool sample, roving, top, scoured or carbonized product, as received at the laboratory.