AS 2001.2.1—1988
Reconfirmed 2016

Australian Standard®

METHODS OF TEST FOR TEXTILES

METHOD 2.1—PHYSICAL TESTS—DETERMINATION OF MEAN FIBRE DIAMETER OF TEXTILE FIBRES BY MEASUREMENT OF PROJECTED IMAGES

This Australian Standard was prepared by Committee TX/20, Testing of Textiles. It was approved on behalf of the Council of the Standards Association of Australia on 23 May 1988 and published on 15 July 1988.

The following interests are represented on Committee TX/20:

Australian Knitting Industries Council
Australian Wholesale Softgoods Federation
Australian Wool Corporation
AWTA Textile Testing
Brisbane College of Advanced Education
Commission Dyers and Finishers Association of Australia
Confederation of Australian Industry
CSIRO, Division of Wool Technology
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Melbourne College of Textiles
Railways of Australia Committee
Society of Dyers & Colourists of Australia & New Zealand
Textile Clothing & Footwear Council of Australia
University of New South Wales
Wool Textile Manufacturers of Australia

STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 2001.2.1—1988
Methods of test for textiles
Method 2.1: Physical tests—Determination of mean fibre diameter of textile fibres by measurement of projected images

RECONFIRMATION NOTICE

Technical Committee TX-020 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 6 July 2016.

The following are represented on Technical Committee TX-020:

Ag Research
Australian Wool Processors Council
AWTA Textile Testing
Council of Textile and Fashion Industries of Australia
Drycleaning Institute of Australia
National Association of Testing Authorities Australia
RMIT University
The Textile Institute

NOTES

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METHODS OF TEST FOR TEXTILES

METHOD 2.1—PHYSICAL TESTS—DETERMINATION OF MEAN FIBRE DIAMETER OF TEXTILE FIBRES BY MEASUREMENT OF PROJECTED IMAGES

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PREFACE

This Standard was prepared by the Association's Committee on Testing of Textiles to supersede AS 2001.2.1 — 1978.

The method takes cognizance of the work of a technical committee of the International Organization for Standardization, ISO/TC 38, and has been adapted to suit Australian conditions.

Whilst this Standard was largely based on ISO 137, consideration has been given to the following documents:

BS 2043	*Method for the determination of wool fibre fineness by the use of a projection microscope*
IWTO-8-66	*Method of determining wool fibre diameter by the projection microscope*
DEF(Aust) 5037	*Method A 25, Annex A, Estimation of wool fineness numbers from measurement of fibre diameter of wool in yarn or fabric*
ASTM D2130	*Standard test method for diameter of wool and other animal fibres by microprojection*

While the above methods relate primarily to the measurement of the mean fibre diameter of wool, this method has been expanded to include other types of fibres which have a regular circular cross-section.

This Standard has given more attention to alternative sampling procedures from a bulk supply.

It should be noted that at the time that this Standard was published a Standard for the procedure to be used in taking a sample of a fabric was being prepared. It is recommended that if this Standard is available it should be consulted where necessary.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

AS 2001.2.1

METHODS OF TEST FOR TEXTILES

METHOD 2.1: PHYSICAL TESTS— DETERMINATION OF MEAN FIBRE DIAMETER OF TEXTILE FIBRES BY MEASUREMENT OF PROJECTED IMAGES

1 SCOPE. This Standard sets out a procedure for determining the mean diameter of fibres of circular or near-circular cross-section by measuring highly magnified images projected onto a viewing screen.

2 APPLICATION. The method is applicable to all fibres of circular or near-circular cross-section. It may be applied to wool fibres taken from all stages of processing, as well as to some man-made fibres, e.g. polyamides, polyesters and glass, and to a limited number of polyacrylic and regenerated cellulose type fibres. The method is not applicable to yarn and fibre embedded in latex or bitumen.

NOTE: Where measurements are being made on blends or mixtures of fibres, care is necessary to ensure that only one type of fibre is measured or that, where possible, fibres are separated before measurement.

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

AS

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

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

1980 Wool—Core sampling of raw wool in bales

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

4 DEFINITION. For the purposes of this Standard, the definition below applies.

4.1 Snippets—short fibre pieces cut to a given length in a microtome.

5 PRINCIPLE. The magnified images of snippets of fibres are projected onto a screen and the width of the screen images is measured. Special techniques, including the use of two operators, are used to minimize operator errors.

6 APPARATUS

6.1 Conditioning facility. Means of providing and maintaining a standard atmosphere as described in AS 2001.1.

6.2 Microscopic device. A microscope comprising a light source, a light condenser, a stage supporting the mounted specimen of fibres, an optical system and a viewing screen. The stage shall be movable in two directions at right angles by means of sliding mechanisms capable of successive displacement at 0.5 mm steps.

The optical system of the microscope shall be capable of providing a magnification of 500 × at the screen. Unless the optics are such that magnification is uniform over the entire area of the screen, the screen shall contain a marked circle so that the optical magnification is uniform within the circle. All measurements shall be made inside this circle.

6.3 Measuring devices. The stage, the screen or the measuring devices shall be capable of rotation to allow all measurements to be made at right angles to the fibre axis at the point of measurement.

One of the following means of measurement shall be used:

(a) *Millimetre scale*. The screen shall carry a movable scale, 50 mm wide, graduated on its underside in millimetres. The scale shall be restricted to diametrical movement across the screen.

NOTE: A movable scale of the type shown in Figure 1 is to be preferred.

(b) *Wedge scale*. A wedge scale, marked in 2μm intervals, printed on a firm backing (such as perspex), as shown in Figure 2.

(c) *Light pen*. Where computer facilities exist to analyze data input a light pen may be used to determine the image outline for subsequent calculation of the diameter.

6.4 Microtome. A microtome capable of fulfilling the requirements of Clauses 7.3.2 and 7.3.3 with regard to the cutting of fibre pieces of a predetermined length. Two suitable types of microtome are shown in Figures 3, 4 and 5. The first, shown in Figures 3 and 4, consists of the following parts:

(a) The microtome holder as shown in Figure 3 is a short piece of smooth steel, G, about 3 mm thick, with a 1.5 mm slot into which slides the tongue of part H. The tongue of part H is fixed by a screw and may thus be adjusted to project different distances into the slot of G.

(b) The pushers, J, as shown in Figure 4, consist of three steel stems with short stop plates near their ends. All the stems have the same width as the slot, viz 1.5 mm. The stem of one pusher extends 0.4 mm beyond the stop plate, that of the second 0.6 mm, and that of the third 0.8 mm.

The second microtome, a precision hand-type, is shown in Figure 5 and consists of the following parts:

(i) The microtome holder, 3 mm thick.

(ii) A graduated micrometer ejection mechanism by means of which specimens of the required length may be selected.