

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 2001.2.9—1977

Methods of test for textiles

Part 2.9: Physical tests—Determination of stiffness of cloth

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.

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NOTES

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
METHODS OF TEST FOR TEXTILES

PART 2—PHYSICAL TESTS

AS 2001.2.9
DETERMINATION OF STIFFNESS OF CLOTH

PREFACE

This standard method for determining the stiffness of textile fabrics is a revision and metrication of AS L41-1965, which it accordingly supersedes.

The procedure is based largely on BS 3356, Determination of Stiffness of Cloth, and on leaflet DF 1A published by Shirley Developments Ltd of Manchester, U.K.

The bending length of a test specimen of the cloth is first determined and from this value the flexural rigidity and bending modulus calculated. From these

attributes the stiffness of the cloth is assessed. For very stiff fabrics a specified mass is added to that of the fabric and the bending length determined accordingly.

This standard requires reference to the following Australian standards:

- AS 1090 Method for Conditioning Textile Materials for Test*
- AS 1587 Method of Measurement of Textile Fabrics

METHOD

1 SCOPE. This standard describes the procedure for determining the bending length of a cloth by means of a fixed-angle flexometer and for calculating its flexural rigidity and bending modulus. These quantities are related to the stiffness of the cloth.

2 APPLICATION. The method applies to all types of cloth, except those that curl or twist excessively when cut into narrow strips.

3 PRINCIPLE. A strip of cloth is allowed to bend under its own mass or with an added mass until the tip of the overhanging portion reaches a prescribed position.

The length of this portion is a function of the bending length. From measurement of the bending length the flexural rigidity and bending modulus are calculated.

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

Bending length—the bending length of a cloth is half the length (in millimetres) of a rectangular strip of cloth which will bend under its own mass to an angle of 41.5 degrees.

NOTE: Bending length is one of the factors that determine the manner in which a fabric drapes. It is related to the quality of stiffness that is appreciated by visual examination of the draped material, in the sense that cloth having a high bending length tends to drape stiffly.

Flexural rigidity—the flexural rigidity is an expression of the product of the mass per unit area of the cloth and the cube of the bending length.

NOTE: Flexural rigidity is a measure of the resistance of the cloth to bending by external forces. It is related to the quality of stiffness that is appreciated when a fabric is handled, in the sense that cloth having a high flexural rigidity tends to feel stiff.

Bending modulus—the bending modulus is an expression of the quotient obtained by the division of the flexural rigidity by the cube of the thickness of the cloth.

NOTE: Bending modulus is related to that degree of stiffness where the thickness is appreciated simultaneously with the resistance to bending. Thus bending modulus may be regarded as characterizing 'fullness' and 'paperiness'. Two fabrics may have the same flexural rigidity but if there is a marked degree of difference in thickness, the thicker fabric will have a lower bending modulus and will be regarded as the 'fuller' of the two.

5 APPARATUS. The following apparatus is required:

- (a) *Flexometer.* A fixed-angle flexometer as shown in Fig. 1.

NOTE: The range of the instrument is governed by its size. It is convenient to be able to determine bending lengths of about 80 - 100 mm, in which case the overhanging length of the specimen is 160 - 200 mm.

On the horizontal platform, P, rests a slide, S, graduated on its upper surface with a scale which indicates bending length directly in units and tenths of a unit. For the angle of inclination of 41.5 ± 0.5 degrees, unit graduations of the scale on the slide are uniformly spaced 20 ± 0.2 mm apart.

When the front edge of the slide coincides with the front edge of P, the zero of the scale on S coincides with the datum line, D, on the instrument. Two sighting lines L₁ and L₂, passing through the upper forward edge of P, and inclined at an angle of 41.5 ± 0.5 degrees below the horizontal, are inscribed on the transparent side pieces of the instrument. The under surface

* To become AS 2001.1.1, Methods of Test for Textiles—Conditioning Procedures.