

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

METHODS OF TEST FOR TEXTILES

PART 5—DIMENSIONAL CHANGE

AS 2001.5.6

DETERMINATION OF DIMENSIONAL CHANGE OF YARNS AND SEWING THREADS

PREFACE

This Standard was prepared by the Association's Committee on Testing of Textiles under the direction of the Textile Standards Board. In the preparation of this Standard, the Committee has considered various international and national Standards and has adapted them to suit Australian conditions. It recognizes the need to incorporate a test at an elevated temperature and also a test at a moderate temperature in a standard test solution.

METHOD

1 SCOPE. This Standard sets out a method for determining the dimensional change of yarns and sewing threads after immersion in a standard test solution.

The method describes two alternative test solution temperatures as follows:

- (a) Test A—Solution temperature 40°C.
- (b) Test B—Solution temperature 100°C.

2 APPLICATION. This method is applicable to monofilament, multifilament and spun yarns, either single, plied or cabled with the exception of yarns which stretch more than 0.5 percent when the tension is increased from 0.5 to 1.0 centinewton per unit of linear density (cN/tex). Test A is the preferred method for wool or wool blend yarns.

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

- AS 2001 Methods of Test for Textiles.
- AS 2001.1 Conditioning Procedures.
- AS 2001.5.1 Dimensional Change—General Requirements.

4 PRINCIPLE. A specimen of yarn or sewing thread is marked and measured for length before immersion in the standard solution at one of the specified temperatures. After drying, the length is remeasured and the resultant dimensional change is calculated and reported.

5 REAGENTS.

Standard test solution. Containing for each litre—

- (a) *Sodium dihydrogen phosphate.* Anhydrous (NaH_2PO_4) 0.5 g
 - (b) *Disodium hydrogen phosphate.* Anhydrous (Na_2HPO_4) 1.0 g
 - (c) *Non-ionic wetting agent.* A non-ionic wetting agent of the ethylene oxide alkyl phenol condensate type (e.g. Lissapol TN or Penetrax) 0.5 g
 - (d) *Water.* To make 1 L
- Adjust the pH of the solution to 7.0 ± 0.2 , if necessary.

Distilled water is not essential. Water of hardness greater than 100 mg/L (CaCO_3) shall not be used.

6 APPARATUS.

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

6.2 Measuring device*. A measuring device incorporating a scale graduated in millimetres and capable of applying a prescribed tension to the yarn or sewing thread while the length is measured.

6.3 Water bath. A bath capable of being controlled at the temperature specified, i.e. either $40 \pm 5^\circ\text{C}$ or $100 \pm 0, -5^\circ\text{C}$.

* A suitable device is the Shirley Crimp Tester.

6.4 Drying cabinet. A drying cabinet to operate at a temperature not exceeding 70°C.

6.5 Marking pen. A marker with water insoluble ink.

7 SAMPLE AND TEST SPECIMENS.

7.1 Sample. In the absence of a material specification the general principles described in AS 2001.5.1 shall be observed with the following qualifications:

- (a) Take a bulk sample of one or more cases, as representative of the consignment to be tested, according to Table 1.

TABLE 1
BULK SAMPLE

Number of cases in consignment	Minimum number of cases to be selected at random
3 or less	1
4 to 10	2
11 to 30	3
31 to 75	4
76 or more	5

Take a total of ten packages from the randomly selected cases, ensuring that each case is equally subsampled, to form the laboratory sample.

In situations where ten packages are not available for testing, all available packages shall constitute the laboratory sample.

- (b) From the end of each package in the laboratory sample, reel a skein of yarn using the least tension practicable to avoid alteration to the twist. The skeins shall be of sufficient length to provide as many test specimens as may be required.

7.2 Conditioning. Condition the sample in accordance with AS 2001.1.

7.3 Test specimens. Select a minimum of ten test specimens to be equally representative of the laboratory sample. Each specimen shall be approximately 500 mm in length. If additional specimens are required from a skein allow at least 2 m between specimens.

8 PROCEDURE. The procedure for each test specimen shall be as follows:

- (a) Using a marking pen, mark the specimen with two marks at least 400 mm apart and approximately 50 mm from the extremities of the specimen.

- (b) Using a suitable device, measure the distance between the pair of marks on the specimen under a tension of 5 mN/tex.
- (c) Record the distance to the nearest 1 mm.
- (d) From Table 2, select the appropriate testing conditions for the specimen.

TABLE 2
TEST CONDITIONS

Type	Solution temperature, °C	Immersion time, min
Test A	40 ±5	30
Test B	100 +0, -5	10

- (e) Heat the test solution to the selected temperature. There shall be sufficient liquor to completely immerse the specimen and to allow free movement.
- (f) Immerse the specimen in the test solution for the time appropriate to the test selected.
- (g) Remove the specimen from the test solution and dry in the cabinet at a temperature not exceeding 70°C.
- (h) Condition the specimen in accordance with AS 2001.1.
- (j) Measure and record the distance between the pair of marks under a tension of 5 mN/tex.

9 CALCULATION AND EXPRESSION OF RESULTS. Calculate the percentage change in dimension for each specimen in accordance with AS 2001.5.1.

Calculate the mean percentage change in dimension for all specimens to the nearest 0.5 percent.

10 REPORT. The following information shall be reported:

- (a) Reference to this Australian Standard, i.e. AS 2001.5.6.
- (b) Test used (Test A or Test B).
- (c) Mean percentage change in dimension for the specimens.
- (d) Percentage change in dimension for each specimen, if required.
- (e) Number of packages in laboratory sample, if applicable.
- (f) Number of cases in consignment, if applicable.

(PAGE 3 IN THE HARD COPY IS BLANK.)