

Australian/New Zealand Standard™

Methods of testing wool packs for greasy wool

Method 3: Surface frictional properties of fabric

AS/NZS 4547.3

1 SCOPE

This Standard specifies a method for determining the surface frictional properties of wool pack fabric in wet and dry conditions.

2 REFERENCED DOCUMENTS

The following document is referred to in this Standard:

AS

2001 Methods of test for textiles

2001.1 Part 1: Conditioning procedures

2706 Numerical values—Rounding and interpretation of limiting values

3 PRINCIPLE

A specimen is mounted on the surface of a horizontal plane attached to the base of a tensile testing machine. Another specimen of the same fabric is attached to a sled and placed in contact with the first specimen. The sled is connected to the cross head of the tensile testing machine by means of a flexible cord and pulley and the cross head is set in motion. The force required to move the sled across the horizontal plane is recorded as a series of peaks on an autographic chart and the average of the peak forces is determined. Where appropriate, this test method is carried out in wet and dry conditions.

4 APPARATUS

The following apparatus is required:

- (a) A conditioning facility with a means of providing and maintaining a standard atmosphere as specified in AS 2001.1.
- (b) A tensile testing machine of the constant rate of extension type capable of a minimum cross head speed of 50 mm/min to permit measurements over the range of 0 to 10 N.
- (c) A horizontal plane (see Figure 1) of smooth, flat, steel plate, approximately 600 mm × 200 mm × 12 mm. A sheet of sponge rubber, 400 mm × 200 mm × 5 mm having a Shore A hardness of approximately 15 shall be permanently affixed to the upper surface of the steel plate as shown in Figure 1. A low friction V-pulley shall be mounted in dual bearings on the steel plate in such a position that, during testing, it will be directly below the cross head of the tensile testing machine and at a height to ensure that the flexible cord (see Item (e)), when attached to the sled, (see Item (d)) is parallel to the horizontal plane.
- (d) A sled (see Figure 2) consisting of a smooth, flat, steel plate, 100 mm × 90 mm × 12 mm. A 5 mm thick sheet of sponge rubber 100 mm × 90 mm having a Shore A hardness of approximately 15 shall be permanently affixed to one surface, and two hooks 70 mm apart shall be symmetrically attached to one end of the sled as shown in Figure 2.

The mass of the composite sled shall be 930 ± 5 g.

- (e) A flexible cord of extensibility at break of less than 5%, and with minimal surface friction properties.
- (f) A paintbrush, 50–75 mm wide and a filtered or distilled water for the wet test.

5 TEST SPECIMENS

The following shall apply:

- (a) Prepare four warp-wise specimens and four weft-wise specimens, marking the outer pack surface on each specimen.
- (b) Specimens shall be taken at least 100 mm from any edge or seam of the wool pack.
- (c) Test samples taken from made up packs shall have two specimens taken from the short side and two specimens taken from the long side in both warp and weft directions.

NOTE: Wet test samples should be marked on the outer surface of each specimen. Only two warp and two weft specimens are required.

- (d) Specimens for mounting on the horizontal surface and on the sled shall be cut with lengths parallel to the warp or weft yarns of the sample fabric.
- (e) Each specimen shall be representative of the sample and shall be free from creases or other surface irregularities. No two specimens shall contain the same longitudinal yarns. Specimens shall be taken from adjoining sides of the wool pack.
- (f) Specimens for the sled shall measure 190 mm × 130 mm.
- (g) Specimens for the horizontal plane shall measure 400 mm × 300 mm.

6 DRY TEST PROCEDURE

The dry test procedure shall be as follows:

- (a) Condition the prepared specimens from the dry side in the standard atmosphere as specified in AS 2001.1. Test the specimens in that atmosphere.
- (b) Select corresponding specimens for both the sled and horizontal plane (i.e. warp-wise sled specimen/warp-wise horizontal plane specimen or weft-wise sled specimen/weft-wise horizontal plane specimen).
- (c) With the outer pack surface exposed, mount the corresponding specimens securely to the sled and horizontal plane. Ensure that the warp (or weft) yarns of both specimens are parallel to the edge of the surface to which they are attached and that both specimens lie flat and are free from any wrinkles or folds.
- (d) Set the instrument at zero and select a full-scale deflection of 10 N.
- (e) Place the sled lengthwise and centrally on the horizontal plane, and, without applying downward pressure, manually slide the sled back and forth five times along the full length of the specimen on the horizontal plane.
- (f) Place the double ended section of the cord over the sled hooks, thread the other end under the V-pulley and attach it to the cell in the cross head of the tensile testing machine directly above the V-pulley.
- (g) Position the sled centrally on the horizontal plane and remove any slackness in the cord by applying a minimum of tension.
- (h) Utilizing a cross head speed of 50 mm/min, allow the sled to traverse a distance of 110 mm along the specimen on the horizontal plane.
- (i) Repeat the procedure described in Steps (g) and (h) using the same specimens.

- (j) Test both sets of specimens.
- (k) Invert the specimens and repeat the procedure given in Steps (c) to (j) inclusive.

7 WET TEST PROCEDURE

The wet test procedure shall be as follows:

- (a) Condition, select and mount the specimens as specified in Clause 6(a).
- (b) Using paintbrush and filtered or distilled water, thoroughly wet surface of the specimens on both the slide and plate. To wet the specimens, dip the brush in a beaker of water, then with one gentle shake, remove excess water. Brush half the specimen on the plate in the direction of slide movement. Repeat this 'dip and shake' process and brush the other half of the specimen. Without re-wetting the brush, brush the whole plate specimen in the direction perpendicular to the direction of slide movement. Again, dip the brush in a beaker of water and with one gentle shake, remove excess water. Brush the specimen on the slide in one direction. Without re-wetting the brush, brush the slide specimen in the direction perpendicular to the first brushing.
- (c) After the test specimen has been wet out, continue by following the dry test procedure Steps (d) to (k).

8 CALCULATION OF RESULTS

Calculate the results as follows:

- (a) For each result, ignore the portion containing the first peak and subdivide the remainder into 10 equal portions each representing 10 mm of cross head separation.
- (b) Determine the highest peak value in newtons for each of the 10 portions.
- (c) Calculate the mean of these 10 highest values.
- (d) Calculate the mean for the outer face of both warp and weft specimens separately.
- (e) Calculate the mean for the inner face of both warp and weft specimens separately.

9 REPORT

The following shall be reported:

- (a) The results in newtons, to two significant figures, for the warp direction and weft direction of the outer surface, rounding results as specified in AS 2706.
- (b) The results, in newtons, to two significant figures, for the warp direction and weft direction of the inner surface, rounding results as specified in AS 2706.
- (c) Report the results for the wet and dry test separately.
- (d) Where appropriate, report the absolute difference between the wet and dry test results.
- (e) A reference to this test method, i.e. AS/NZS 4547.3.