

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard METHODS OF TEST FOR TEXTILES

PART 2—PHYSICAL TESTS

AS 2001.2.8 AS 2001.2.8-1980 DETERMINATION OF TEAR RESISTANCE OF FABRICS BY THE FALLING-PENDULUM (ELMENDORF) APPARATUS

PREFACE

This standard method for measuring the tear resistance of fabrics using the Elmendorf apparatus is technically identical with that specified in ASTM D1424-63 (Reapproved 1975), Test for Tear Resistance of Woven Fabrics by Falling-Pendulum (Elmendorf) Apparatus. Increasing attention is being paid to the tear resistance of fabrics as an indication of the performance of the fabric in use.

The results obtained by this method are similar to those obtained by other methods for wing-rip tears, e.g. AS 1091, Method for the Determination of the Tear Resistance of Woven Textile Fabrics by the Wing-rip Method, but differences in tear resistance occur. The resistance value will depend in part on the

rate of tearing. This method has the advantages of simplicity and speed in testing, since test specimens are cut with a die and results are read directly from the scale on the pendulum. The specimens are relatively small in area. The test requires that a standard length of specimen be torn and, as the reading obtained is directly proportional to that length, the specimen must be cut accurately. The capacity of the apparatus must be selected so that the specimen tears at a value between 20 and 60 percent of the scale.

This standard requires reference to the following Australian standard:

AS 1090 Method for Conditioning Textiles Materials for Test*

METHOD

1 SCOPE. This standard describes the procedure for determining the average force required to propagate a single-rip, tongue-type tear starting from a cut in a fabric, using the falling pendulum Elmendorf apparatus.

2 APPLICATION. The method is applicable to treated and untreated fabrics, including those heavily sized, coated or resin-treated, e.g. wash-wear.

3 PRINCIPLE. The average force required to complete a tongue-type tear in a fabric is determined from measurements of the work done in tearing it through a standard distance. The apparatus consists of a sector-shaped pendulum carrying a clamp which is in alignment with a fixed clamp when the pendulum is in the raised starting position with maximum potential energy. A test specimen is fastened in the clamps and the tear is started by a slit cut in the specimen between the clamps. The pendulum is then released and the specimen is torn as the moving jaw moves away from the fixed one. The scale attached to the pendulum is graduated to read the tearing force directly on a centesimal scale (i.e. a scale of 100 units) may be attached.

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

Lengthwise tests—tests in which the tear propagates along the length of the fabric.

Widthwise tests—tests in which the tear propagates at right angles to the length of the fabric.

5 APPARATUS. The following apparatus is required:

- (a) *Falling-pendulum Elmendorf apparatus.* The apparatus may have a number of energy ranges obtained by augmenting weights which are fixed to the pendulum and a corresponding scale graduated and figured appropriately for each range so as to provide for a wide range of fabrics, and convenient scale readings. The apparatus is securely fixed in position to prevent movement during testing. A typical apparatus is described in Appendix A.
- (b) *Cutting die.* A die having essentially the shape and dimensions shown in Fig. 1. The die cuts the basic rectangular test specimen 100 × 2 mm long by 63.0 × 0.2 mm wide, plus an additional 20 mm of fabric at the top edge of the specimen to ensure that the last portion of the fabric is torn during the test. The critical dimension of the test specimen is the 43 × 0.2 mm of fabric which is to be torn during the test.

6 TEST SAMPLE AND TEST SPECIMENS.

6.1 Selection. The test sample shall be representative of the piece under test and shall be 1 m in length. The test sample shall not be cut within 2 m of the lead-end or tail-end of a piece or closer to the selvage than one-tenth of the width of the piece.

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