

## STANDARDS ASSOCIATION OF AUSTRALIA

## Australian Standard

## AS 2983.8

## METHODS OF TEST FOR SYNTHETIC SPORTING SURFACES

**METHOD 8:  
DETERMINATION OF TEAR RESISTANCE**

**1 SCOPE.** This Standard sets out a method for determining tear resistance of a synthetic sporting surface.

**2 PRINCIPLE.** Samples of synthetic surfaces are cut into strips and a longitudinal slit is cut into each test specimen. These specimens are mounted in a testing machine and the tear forces are determined.

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

AS 2103 Dial Gauges and Dial Test Indicators.

AS 2193 Methods for Calibration and Grading of Force-measuring Systems of Testing Machines.

AS 1457 Gauge Blocks and Accessories.

**4 APPARATUS.** The following apparatus is required:

- (a) *Testing machine.* With a weighing head that can measure the load applied to tear the test specimen. It should be equipped with a device for recording the load carried by the test specimen and the amount of separation of the grips during the test. The testing machine shall be essentially free from inertia lag at the specified rate of testing and shall indicate the load with an accuracy of  $\pm 2$  percent of the indicated value or better. The accuracy of the testing machine shall be verified in accordance with AS 2193. A device shall be included to control the grip separation rate at 100 mm/min to an accuracy of  $\pm 10$  percent.
- (b) *Cutter.* A sharp razor blade or the equivalent.
- (c) *Micrometer.* A dead weight micrometer with a flat anvil of 6 mm diameter or larger in area and a 5 mm diameter flat surface on the head of the spindle. The total force applied by the spindle head shall be 1.2 N. The micrometer gauge shall read to 2.0  $\mu\text{m}$ .

NOTE: The bench type micrometer gauge normally used is only a comparator and should be regularly checked and calibrated in accordance with AS 2103, using slip gauges of Inspection Grade as specified in AS 1457.

**5 PREPARATION OF TEST SPECIMENS.** Each test specimen shall be a piece of the surface cut into strips at least 100 mm by  $15 \pm 1$  mm wide and having a clean longitudinal slit  $40 \pm 1$  mm long cut with a sharp razor blade (see Figure 1).

The thickness of the test specimen below the slit (see Figure 1) shall be measured in several places and recorded in millimetres to the nearest 2  $\mu\text{m}$ .

Wherever possible, test specimens shall be selected so that their thickness is uniform to within 5 percent of the thickness over the length of the unslit portion of the test specimen.

Enough test specimens shall be cut to provide a minimum of five tear propagation force determinations each in the longitudinal direction and in the transverse direction of the material being tested.

**6 CONDITIONING.** Each test specimen shall be conditioned for a minimum period of 3 h at  $23 \pm 2^\circ\text{C}$ , immediately prior to testing. Testing shall be conducted in an environment controlled at  $23 \pm 2^\circ\text{C}$ .

**7 PROCEDURE.** The procedure shall be as follows:

- (a) Secure the test specimen in the testing machine as shown in Figure 2.
- (b) Using a grip separation of  $100 \pm 10$  mm/min, start the machine and record the load necessary to propagate the tear through the entire unslit portion.
- (c) Test not less than five test specimens in each of the principal directions.

**8 CALCULATION.** Complete calculations as follows:

- (a) For surfaces that have load-time charts characterized by Figure 3, the average tear propagation force in newtons is obtained by averaging the load in kilograms indicated on the chart over the time period in seconds, disregarding the initial and final portions of the curve. This can be done with an integrator or a planimeter. In some cases, a fairly accurate estimate can be made by eye.
- (b) For surfaces that have load-time charts characterized by Figure 4, the maximum force attained is obtained from the chart and reported in newtons.
- (c) For each series of tests, all values obtained shall be determined to three significant figures.