

## STANDARDS ASSOCIATION OF AUSTRALIA

## Australian Standard

## METHODS OF TEST FOR TEXTILES

## PART 2: PHYSICAL TESTS

# AS 2001.2.19

## DETERMINATION OF BURSTING FORCE OF TEXTILE FABRICS—BALL BURST METHOD

## PREFACE

This Standard was prepared by the Association's Committee on Testing of Textiles. The test method is based on the American Society for Testing and Materials, ASTM D 3787—*Standard test method for bursting strength of knitted goods—Constant-rate-of-traverse (CRT) ball burst test*.

It should be noted that at the time that this Standard was published a Standard for the procedure to be used in taking a sample of a fabric was being prepared. It is recommended that if this Standard is available it should be consulted where necessary.

## METHOD

**1 SCOPE.** This Standard sets out a method for determining the bursting force of textile fabrics in equilibrium with the standard atmosphere for testing and of fabrics in the wet state. The method uses a tensile machine based on the constant rate of extension principle.

**2 APPLICATION.** The method is applicable in a number of situations where a tensile strength test is not suitable, particularly where fabrics stretch is an important characteristic. The method is applicable to fabrics produced by weaving, knitting or felting and may be suitable for fabrics produced by other techniques. The method is applicable to fabrics whether or not they have been impregnated or coated with sizing or stiffening materials, rubber, plastics, etc.

**3 REFERENCED DOCUMENTS.** The documents below are referred to in this Standard.

AS

2001 Methods of test for textiles

Method 1: Conditioning procedures (AS 2001.1)

2193 Methods for calibration and grading of force—Measuring systems of testing machines

**4 DEFINITION.** For the purpose of this Standard, the definition below applies.

**4.1 Bursting force**—the maximum recorded force required to rupture the test specimen. It is expressed in newtons (N).

**5 PRINCIPLE.** A test specimen of fabric is firmly held in a clamping device and the force required to rupture the fabric with a metal ball is measured.

**6 APPARATUS.**

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

**6.2 Force application device.** A constant rate of extension (CRE) tensile testing machine as follows:

- The machine shall comply with the requirements of Grade B machines as specified in AS 2193.
- The machine shall provide a means for indicating the force applied to the test specimen clearly and continuously on a dial, scale or chart.
- The capacity of the machine or the selected range of the machine shall be such that the force required to rupture the test specimen shall be not less than 20 percent of the selected range of the machine.
- The force shall be applied by the machine at a constant rate of  $300 \pm 15$  mm per minute.
- The force measuring mechanism in the machine shall allow little or no movement of the ball burst assembly in the direction perpendicular to the applied force.

**6.3 Ball burst attachment.** The CRE machine shall have an attachment fitted consisting of the following:

- A polished steel ball  $25.0 \pm 0.1$  mm in diameter which replaces one of the jaws of the CRE machine.
- A clamping device consisting of two annular rings of an internal diameter of  $45.00 \pm 0.25$  mm, which replaces the other jaw. The faces of the rings shall be perpendicular to the

direction of the application of the force. Suitable packing materials or embedding techniques shall be used whenever necessary to prevent the test specimen slipping in the ring clamps.

**6.4 Water bath.** A container in which specimens can be immersed in water at a temperature of  $20 \pm 5^\circ\text{C}$  prior to wet testing.

## 7 REAGENTS.

**7.1 Water.** Filtered tap water at  $20 \pm 5^\circ\text{C}$  for wetting and rinsing specimens prior to wet testing.

**7.2 Wetting agent.** Ethoxylated derivative of a synthetic alcohol (non-ionic) wetting agent\*.

**8 SAMPLE AND TEST SPECIMENS.** Care should be taken to ensure that the operator's hands are dry. Excessive handling of the sample and test specimens should be avoided.

**8.1 Sample.** The sample shall be selected in one of the following ways:

- (a) According to the directions given in the relevant material specification.
- (b) According to the procedure agreed upon by the interested parties, if such directions are not included in the material specification.
- (c) According to the procedures approved by the Standards Association of Australia for textile products (see Preface), if directions on sampling are not included in the material specification.

**8.2 Conditioning.** Condition the fabric sample in accordance with AS 2001.1. Prepare test specimens from the sample and conduct subsequent testing without removal from the standard atmosphere.

## 8.3 Test Specimens.

**8.3.1 Number.** Cut five specimens, or the number of specimens agreed upon by the interested parties.

**8.3.2 Dimensions.** The specimens shall be of any shape but of sufficient size to protrude outside the annular clamping rings around the complete circumference.

**8.3.3 Wet test specimens.** When it is required that specimens are to be tested in the wet state place the specimens, already prepared, (see Clause 8.1 to 8.3) in the water bath containing water (see Clause 7.1) and a wetting agent (see Clause 7.2) at a concentration of 0.2 g/L. Allow the specimens to sink under their own weight or forcibly immerse them for 1 h. The specimens shall be rinsed for half a minute in filtered tap water prior to testing.

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

- (a) Testing shall be conducted in the standard atmosphere for testing (see Clause 6.1).
- (b) Place the specimen without tension in the clamping device and clamp securely. If the specimen is wet it shall be inserted in the clamping device within 1 minute of removal from the rinse water.
- (c) Start the machine to move the metal ball onto the specimen until the specimen ruptures.
- (d) If a specimen slips in the clamping device, discard the specimen and the result obtained from it, and prepare and test a further specimen, preferably from an adjacent area of the sample. Record the bursting force.

**10 CALCULATION AND EXPRESSION OF RESULTS.** Calculate the mean bursting force and express the result to the nearest newton.

**11 TEST REPORT.** The following information shall be reported:

- (a) Reference to this Australian Standard, i.e. AS 2001.2.19.
- (b) Mean bursting force, in N.
- (c) Individual results, if required.
- (d) State of the test specimens (conditioned or wet).
- (e) Number of test specimens if other than five.

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\* Teric BL 8 produced by ICI Australia Ltd is a suitable wetting agent.