

# Australian Standard®

## Geotextiles—Methods of test

### Method 5: Determination of puncture-resistance—Drop cone method

#### FOREWORD

The determination of the puncture resistance with the drop cone makes use of the modified CBR mould. Evaluating the resistance to tear initiation, this test is particularly relevant in situations where coarse aggregate or riprap is dropped or pushed against the fabric. It is a simple test and requires a minimum of equipment.

#### METHOD

**1 SCOPE.** This Standard sets out the method for determining the puncture resistance of geotextiles by the drop cone method, for both atmospheric-conditioned and wet-conditioned specimens.

**2 APPLICATION.** This method is applicable to both woven and non-woven geotextiles and may also be used for geomembranes and composites. It is a useful index test for quality acceptable under field conditions.

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

AS

3704 Geotextiles—Glossary of Terms

3706 Geotextiles—Methods of test

3706.1 Method 1: General requirements, sampling, conditioning, basic physical properties, and statistical analysis

3706.4 Method 4: Determination of burst strength—California bearing ratio (CBR) plunger method

1289 Methods of testing soils for engineering purposes

1289.F1.1 Method F1.1: Soil strength and consolidation tests—Determination of the California bearing ratio of a soil—standard laboratory method for a remoulded specimen.

**4 PRINCIPLE.** A circular specimen is gripped around its entire circumference by clamps. A cone of specified mass is dropped onto the surface of the specimen. The diameter of the punctured hole, in combination with the drop height, gives a measure of the puncture resistance.

The relationship between the drop height and the diameter of the hole has been found, from testing a wide range of geotextiles, to be—

$$d_2 = d_1 \left( \frac{h_2}{h_1} \right)^{0.68} \quad \dots 4(1)$$

$$h_2 = h_1 \left( \frac{d_2}{d_1} \right)^{1.47} \quad \dots 4(2)$$

where

$h_1$  = drop height (first value), in millimetres

$h_2$  = drop height (second value), in millimetres

$d_1$  = diameter of hole corresponding to a drop height  $h_1$ , in millimetres

$d_2$  = diameter of hole corresponding to a drop height  $h_2$ , in millimetres

NOTES:

1. The exponent applying to Equation 4(1) was found to be generally in the range between 0.55 and 0.7. The value of 0.68 was established as the best approximation.

