

Australian Standard®

Methods for sampling and testing aggregates

Method 27: Resistance to wear by attrition

1 SCOPE This Standard sets out the method for testing rock for resistance to wear using the Deval attrition machine, and for measuring the attrition value of freshly crushed rock.

2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

- 1141 Methods for sampling and testing aggregates
- 1141.2 Method 2: Basic testing equipment
- 1141.3 Method 3: Sampling of aggregates and rock
- 1141.14 Method 14: Particle shape by proportional calliper
- 1152 Specification for test sieves

3 APPARATUS The following apparatus is required:

- (a) *Deval attrition machine*—consisting of one or more hollow steel cylinders closed at one end and furnished with a tightly fitting steel cover at the other. The cylinders shall have internal dimensions of 200 mm in diameter and 340 mm in length and shall be mounted on a shaft with their axes included at 30° to the axis of rotation of the shaft, and the axes shall intersect at the midpoints of the hollow cylinders' axes (see Figure 1).

The rate of rotation shall be 30 rpm to 33 rpm.

- (b) *Sieves*—53.0 mm, 37.5 mm and 2.36 mm test sieves in accordance with AS 1152.
- (c) *Balance*—of adequate capacity, readable to 1 g and having a limit of performance not exceeding ± 5 g, in accordance with AS 1141.2.
- (d) *Oven*—thermostatically controlled, to operate at a temperature within the range of 105°C to 110°C.
- (e) *Dishes and trays*.

4 SAMPLING Sampling shall be in accordance with AS 1141.3. There shall be obtained a bulk sample of at least 60 kg of the aggregate to be tested, or sufficient material to provide a test portion of at least 30 kg mass.

5 PREPARATION OF TEST PORTION The test portion shall be prepared as follows:

- (a) Sieve the bulk sample over 53 mm and 37.5 mm sieves and separate the material passing the 53 mm and retained on the 37.5 mm sieve. Discard the remainder of the sample.
- (b) Discard any particles which are found to be misshapen when tested in accordance with AS 1141.14 using a proportional caliper ratio of 2:1.
- (c) Discard any particle where the fractured edges have been rounded by mechanical handling processes.