

Australian Standard®

Methods for sampling and testing aggregates**Method 32: Weak particles (including clay lumps, soft and friable particles) in coarse aggregates**

This Standard incorporates Amendment No. 1 (March 2016). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

1 SCOPE

This Standard sets out the method for determining the percentage of weak particles in coarse aggregates.

2 NORMATIVE REFERENCES

The following documents are indispensable for the application of this Standard.

AS

1141	Methods for sampling and testing aggregates
1141.1	Method 1: Definitions
1141.2	Method 2: Basic testing equipment
1152	Specification for test sieves

3 TERMS AND DEFINITIONS

For the purpose of this Standard, the terms and definitions given in AS 1141.1 and the one below apply.

3.1 Weak particles

Particles present in an aggregate sample that are identified as such when tested in accordance with this Standard. Such particles include clay lumps, soft and friable particles.

4 APPARATUS

The following apparatus, complying with the relevant provisions of AS 1141.2, is required:

- (a) *Balance* A balance of sufficient capacity, with a limit of performance not exceeding $\pm 5\text{g}$.
- (b) *Container* A metal dish of sufficient size.
- (c) *Oven* Oven that is thermostatically controlled to operate at a temperature of 105°C to 110°C .
- (d) *Sample dividers or quartering equipment*
- (e) *Sieve* A 2.36 mm sieve, complying with AS 1152.

5 TEST PORTION

The test portion shall be selected and prepared as follows:

- (a) Obtain a sub-sample from the laboratory sample either by quartering or by the use of a sample divider so that the test portion will contain sufficient material retained on a 4.75 mm sieve to comply with Table 1.
- (b) Handle in such a manner as will avoid breaking up any weak particles that may be present.
- (c) Dry the test portion to constant mass at a temperature of 105°C to 110°C and record the mass (m_1).
- (d) Examine the test portion for any suspected weak particles, remove and retain them.
- (e) Carefully wash the test portion with water over a 2.36 mm sieve to remove fine material and adhering fines. Agitation during the washing process shall be kept to a minimum to avoid breaking up any weak particles still present and a dispersing agent shall not be used. If any unidentified weak particles have appeared to have disintegrated during the washing process the test portion is to be discarded and a new test portion prepared. The appearance of the unidentified weak particle shall be noted so that they will be recognized and removed from the next test portion.
- (f) Dry the test portion retained on the 2.36 mm sieve to constant mass at a temperature of 105°C to 110°C, replace any suspected weak particles previously removed in Step (d) and record the total mass (m_2).

TABLE 1
SIZE OF TEST PORTION

Nominal size mm	Graded materials minimum mass (kg)		One-sized aggregates minimum mass kg
	A (Note 1)	B (Note 2)	
>40	15	10	10
>20 ≤40	10	5	4
>10 ≤20	2	1	0.7
>7 ≤10	0.5	0.3	0.2
<7	0.3	0.15	—

NOTES:

- 1 The quantities given in Column A should be used in cases of dispute.
- 2 The quantities given in Column B may be used in routine tests.

6 PROCEDURE

The procedure shall be as follows:

- (a) Spread the dry test portion in a thin layer on the bottom of the container.
- (b) Cover the test portion in water and allow it to soak for a period of 24 ±4 h. Squeeze each individual particle between the thumb and forefinger to attempt to break particles into smaller sizes. Remove any particles that deform under finger pressure as they are classified as clay lumps and discard them from the test portion.
- (c) Wash the sample over a 2.36 mm sieve using manual agitation until all undersize material is removed.

- (d) Dry the material retained on the 2.36 mm sieve to constant mass at a temperature of 105°C to 110°C and record the mass (m_3).

7 CALCULATION

- (a) The percentage of weak particles in coarse aggregate shall be calculated using the following equation:

$$W = \frac{m_2 - m_3}{m_1} \times 100 \quad \dots 1$$

where

W = weak particles expressed as a percentage of the mass of the test portion

m_2 = total mass of test portion prior to test

m_3 = dry mass of test portion remaining after removal of weak particles

m_1 = total dry mass of the test portion

- (b) The percentage of the original sample passing the 2.36 mm sieve shall be calculated using the following equation:

$$P = \frac{m_1 - m_2}{m_1} \times 100 \quad \dots 2$$

where

P = percentage of the original sample passing the 2.36 mm sieve

m_1 = total dry mass of the test portion

m_2 = total mass of test portion prior to test

8 REPORT

The following shall be reported:

- (a) The proportion of weak particles (W) to the nearest 0.1%.
- (b) The percentage of the original sample passing the 2.36 mm sieve.
- (c) The number of this Australian Standard, i.e., AS 1141.32.