

Australian Standard™

AS 1141.25.2

Methods for sampling and testing aggregates**Method 25.2: Degradation factor—Coarse aggregate**

This Standard incorporates Amendment No. 1 (August 2019). 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 the determination of the degradation factor of coarse aggregates. The test categorizes the fines produced by self-abrasion in the presence of water.

NOTE: This Method is based on Washington State Highways Department (WSHD) Test Method No. 1134, *Method of Test for Determination of Degradation Value*. Most of the experience with this Method has been with basic igneous rocks, but it may be used for other igneous and metamorphic rock types. The selection of an appropriate test sample depends on visual categorization of aggregate particles.

2 APPLICATION

This Method is intended mainly for use as a diagnostic test and rejection of aggregate should not be based on the results of this Method alone. Due to the labour intensive nature of the sample selection, it is not recommended for routine production control.

3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

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| | 1141 | Methods for sampling and testing aggregates |
| A1 | 1141.1 | Part 1: Definitions |
| | 1141.2 | Method 2: Basic testing equipment |
| | 1141.3.1 | Method 3.1: Sampling—Aggregates |

A1 | **[Text deleted]**

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| | 1289 | Methods of testing soils for engineering purposes |
| | 1289.3.7.1 | Method 3.7.1: Determination of the sand equivalent of a soil using a power-operated shaker |

ASTM

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| | D2419 | Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate |
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Washington State Highways Department (WSHD) Test Method No. 1134, Method for Test for Determination of Degradation Value

4 DEFINITIONS

For the purpose of this Standard the definitions in AS 1141.1 apply.

5 APPARATUS

A1 | The following apparatus, conforming to the relevant provisions of AS 1141.2 and the requirements given below, is required:

- (a) *Balance*—of sufficient capacity with a limit of performance not exceeding ± 0.5 g.
 - (b) *Basket(s)*—woven wire mesh washing basket(s) with mesh openings between 1 mm and 2 mm.
 - (c) *Brushes*—sieve-cleaning brushes.
 - (d) *Canister*—plastic, approximately 190 mm diameter by 150 mm high, with tightly fitting lid.
 - (e) *Crusher*—or other suitable equipment, for reducing the aggregate particles to the required size.
 - (f) *Measuring cylinders*—two, of—
 - (i) 500 mL capacity, graduated at 100 mL intervals, with rubber or plastic stopper; and
 - (ii) 10 mL capacity, graduated at 1 mL intervals.
 - (g) *Test cylinder*—sand equivalent cylinder made of transparent plastic material of adequate strength and having outside diameter of 40 ± 0.5 mm, inside diameter of 32 ± 0.5 mm and height of 430 mm (see Figure 1). The cylinder shall be graduated in 5 mm intervals from the bottom to a height of 380 mm. A rubber stopper is required for the cylinder.
- NOTE: This is the same cylinder used for the determination of the sand equivalent of a soil using a power-operated shaker (see AS 1289.3.7.1).
- (h) *Dishes, trays and quartering equipment.*
 - (i) *Funnel*—on legs to hold nested sieves over the 500 mL measuring cylinder (see Figure 2).
 - (j) *Mechanical sieve shaker* (optional).
 - (k) *Oven*—thermostatically controlled to operate at a temperature of 105°C to 110°C.
 - (l) *Sample divider (riffle splitter)*—where riffle splitters are used, use appropriate size.
 - (m) *Shaker*—modified Tyler Shaker, with a 22 ± 0.25 mm eccentricity on the cam to give a total throw of 44 ± 0.5 mm at 300 ± 5 cycles per min (see Figure 2).

- A1 | (n) *Sieves*—300 mm diameter, as follows:
 - (i) Nested sieves 2.00 mm and 75 μ m, for fitting into a large funnel. A non-reinforced sieve shall be used.
 - (ii) 19.0 mm, 13.2 mm, 9.50 mm, 6.70 mm, 4.75 mm (perforated plate) and 2.00 mm (wire cloth) and pan.
- (o) *Sprayer*—water sprayer; e.g., barber's spray.
- (p) *Timer*—capable of being read in seconds.

6 STOCK SOLUTION

The following components shall be used to prepare the stock solution. If the use of formaldehyde as a biocide is of concern, the formaldehyde need not be added to the stock solution, provided that there is evidence that its absence will not lead to the growth of fungi (see Notes 2 and 3):

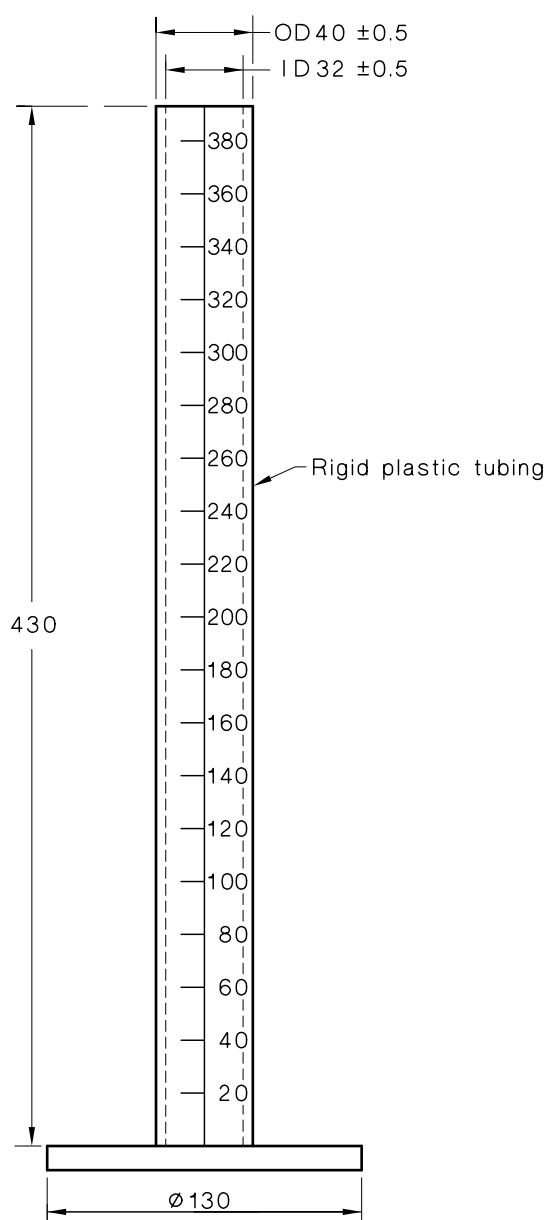
- (a) 219 g $\pm$ 2 g of crystallized calcium chloride hexahydrate, AR grade.
- (b) 480 g $\pm$ 5 g of glycerine of 99% glycerol, BP grade.
- (c) 12 g $\pm$ 0.5 g of 40% formaldehyde solution, BP grade.

CAUTION: THE COMPONENTS OF THE STOCK SOLUTION USED IN THIS METHOD MAY BE HAZARDOUS TO HEALTH UNLESS PROPER PRECAUTIONS ARE TAKEN. THEREFORE, IT IS ESSENTIAL THAT OPERATORS RECEIVE INSTRUCTIONS IN THE POTENTIAL HAZARDS AND PRECAUTIONS, TOGETHER WITH ROUTINE SAFETY PROCEDURES. DETAILS OF RISKS OUTLINED IN A MSDS SHALL BE AVAILABLE IN THE LABORATORY. WHERE THE MSDS REQUIRES, THE STOCK SOLUTION SHALL BE PREPARED IN A SUITABLE FUME CUPBOARD.

Mix the three components in a 1 L volumetric flask and add distilled water to make 1 L of the stock solution (see Note 4).

NOTES:

- 1 This is the same solution used for the determination of the sand equivalent of a soil using a power-operated shaker (see AS 1289.3.7.1).
- 2 Main Roads Queensland researched the removal of formaldehyde in 1995 and demonstrated that its removal would not affect the results provided the stock solution was used within five days.
- 3 The removal of formaldehyde as a biocide is acceptable in ASTM D2419 and this formed the technical basis of its acceptance in this Standard.
- 4 Other water of good quality may be used for solutions; however, it should be checked by comparing results of tests on identical samples using solutions made with the water in question and with distilled water.



DIMENSIONS IN MILLIMETRES

FIGURE 1 TEST CYLINDER