

Australian Standard®

AS 1141.41:2017

Methods for sampling and testing aggregates

Method 41: Polished aggregate friction value— Horizontal bed machine

1 SCOPE

This Standard sets out the method for determining the polished aggregate friction value (PAFV) of naturally occurring or artificially produced materials which are intended to be used as, or to be a source of, pavement surfacing material by polishing using the horizontal bed machine. Following accelerated polishing of the material by this method the PAFV is determined by the method in AS 1141.42.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS	
1141	Methods for sampling and testing aggregates
1141.42	Method 42: Pendulum friction test
1152	Specification for test sieves
AS/NZS	
4518	Bonded abrasives—Determination and designation of grain size distribution
4518.2	Part 2: Micro grits F230-F1200
BS EN	
1097	Tests for mechanical and physical properties of aggregates
1097-8	Part 8: Determination of the polished stone value

3 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

3.1 Dummy specimens

Specimens that have been polished and tested, which would otherwise be discarded. They are used to make up the number of specimens to nine when less than eight test specimens are to be polished.

3.2 Polished aggregate friction value (PAFV)

The friction value obtained for specimens prepared, polished and tested in accordance with this Standard.

3.3 Reference material

Aggregate from an endorsed source for which the unpolished and polished friction values are known (see Appendix A).

3.4 Reference specimens

Specimens incorporating reference material prepared in accordance with Appendix A.

NOTE: One unused reference specimen is included in each test run and is polished and tested at the same time as the test specimens. Its function is to indicate whether the polishing and testing procedures have been correctly carried out.

3.5 Test specimens

Specimens incorporating aggregate prepared from a material for which the PAFV is required.

4 APPARATUS

The following apparatus is required:

(a) *Horizontal bed polishing machine* (See Figures 1 and 2) rigidly mounted on a firm level base, and comprised and constructed as follows:

- (i) *Specimen bed* an electrically driven circular specimen bed of about 700 mm in diameter, revolving at 33 r/min to 35 r/min, and with provision for accurately positioning the nine specimens.
- (ii) *Solid rubber-tyred wheels* Replaceable rubber-tyred wheels not exceeding 225 mm in diameter, 35 mm to 37 mm wide with a Shore A rubber hardness 60 ± 5 . Two sets of four rubber-tyred wheels are required for each polishing run, one set for use with the silicon carbide grit and the other set with the aluminium oxide powder. Any tyre shall be discarded if it shows signs of irregular wear, or its hardness falls outside of the above limits, or the diameter becomes less than 210 mm.

Each wheel shall be capable of being brought to bear on the surface of the specimens mounted on the specimen bed with a total force of 155 ± 5 N.

NOTE: The total force of 155 ± 5 N for each wheel is normally achieved by means of appropriate weights attached to each wheel mount. The actual applied force should be verified either by calculation or direct measurement.

The wheels shall be located such as to give a polishing track of 110 mm minimum width and a length of 130 mm across the face of the specimens.

Each wheel is toed in at an angle of 5 degrees to the tangent of the circular tracks at the centre of the contact area between wheel and specimen, so as to provide a side-slipping action as the specimen bed revolves.

- (iii) *Grit feeder* Abrasive grit feeder and water feed control for delivering abrasive and water to the surface of the specimens in front of the inner track wheel.
- (b) *Clock or timing device* for periods of 2 h preferably with an alarm.
- (c) *Mould* To make specimens for the horizontal bed polishing machine consisting of the following components:
- (i) A specimen moulding frame of steel strip about 3 mm thick by 25 mm wide, in the shape of a truncated wedge, about 200 mm at the wide end, 90 mm at the narrow end, 180 mm long and 25 mm deep.
 - (ii) A base plate of glass or metal on which the moulding frame is placed during the preparation of the test specimens.
 - (iii) A mounting plate of aluminium of similar shape to the moulding frame but of longer dimensions to allow for bolt holes for attaching the test specimens to the specimen bed of the polishing machine.

- (d) *Ovens* Thermostatically controlled with good air circulation, and capable of maintaining a temperature within the range of 105°C to 110°C and 45°C to 50°C.
- (e) *Sieves* Sizes 19.0 mm, 13.2 mm, 9.50 mm and 6.70 mm, complying with AS 1152.
- (f) *Slotted sieves* Complying with the following aperture requirements:

Size of particles, mm		Size of rectangular apertures, mm	
Passing sieve	Retaining sieve	Length (desirable)	Width (mandatory)
19.00	13.20	50	13.2 ±0.2
13.20	9.50	40	9.7 ±0.2
9.50	6.70	30	6.8 ±0.1

- (g) *Disposable cups*.
- (h) *Metal spatula*.
- (i) *Fine-haired brush* About 3 mm in size, to clean the abrasive feed mechanism.



FIGURE 1 HORIZONTAL BED POLISHING MACHINE