AS 1774
Refractories and refractory materials—Physical test methods

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Mouldable refractories—Workability index
5pp C

Sets out a method for determining the workability of mouldable refractories at room temperature, by subjecting a cylindrical specimen to predetermined impacts.

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Australian Standard

METHODS OF PHYSICAL TESTING OF REFRACTORIES AND REFRACTORY MATERIALS

AS 1774.21
THE DETERMINATION OF WORKABILITY INDEX OF MOULDABLE REFRACTORIES

1 SCOPE. This standard sets out the method for determining the workability index of a mouldable refractory at room temperature.

2 PRINCIPLE. A cylindrical test specimen is prepared and subjected to impact and the resulting deformation is determined.

3 DEFINITION. For the purpose of this standard, the following definition applies:

Workability index—the deformation of a test specimen, expressed as a percentage of its original height, when subjected to impact under specified conditions.

4 APPARATUS.

4.1 Ramming apparatus (see Fig. 1 (a)).

4.1.1 *General.* The apparatus shall consist of a modified ASTM* sand rammer or an apparatus capable of performing the same operation. It comprises three parts as described below.

4.1.2 *Ramming unit.*

(a) *Description.* The unit shall consist of a vertical shaft, to the lower end of which is fitted a plunger. The plunger shall be a sliding fit inside the mould (Clause 4.1.3).

A cylindrical weight of mass 6.4 ±0.1 kg is able to fall freely down the shaft over a distance of 50 ± 1 mm as determined by a restraining collar firmly fixed to the shaft at the lower limit of this distance. Provision shall be made for the weight to be raised through its drop height by means of a manually-operated cam.

(b) *Mounting.* The ramming unit shall be firmly affixed to the top of a column constructed from brick, concrete, steel or hardwood or other hard material of high inertia.

4.1.3 *Mould.* The mould shall be cylindrical and constructed of hardened steel with internal diameter of 50 ± 1 mm and internal length 120 ± 1 mm. The mould shall have a removable base. A plunger is required to eject the test specimen from the mould.

4.1.4 *Measuring rule.* This shall be a steel rule whose scale is approximately 150 mm long, graduated in 0.5-millimetre increments and attached to the top of the ramming unit so as to measure the position of the upper end of the shaft. The rule shall be positioned as shown in Fig. 1(b) such that the reading is a direct measurement of the height of the test specimen.

4.2 Balance. A balance capable of weighing up to 500 g to an accuracy of ± 5 g.

5 PROCEDURE. The procedure shall be as follows:

(a) Weigh out an appropriate mass of material to give the approximate sample size.

(b) Break the material into lumps not exceeding 20 mm in any dimension and transfer the material to the cleaned and oiled mould.

(c) Place the mould in the ramming unit and compact the test material by subjecting it to ten (10) impacts in one continuous action. Invert the mould and apply a further ten impacts.

*See ASTM C 181—Standard Test Method for Workability Index of Fireclay and High-alumina Plastic Refractories.

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