

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 1774.33—2003

**Refractories and refractory materials—Physical test methods
Method 33: Determination of the setting time of castables**

RECONFIRMATION NOTICE

Technical Committee MN-007 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 4 April 2013.

The following are represented on Technical Committee MN-007:

Australasian Institute of Mining and Metallurgy
Australian Ceramic Society
Bureau of Steel Manufacturers of Australia
Cement Industry Federation
CSIRO Manufacturing & Materials Technology
Institute of Refractories Engineers
Refractories Manufacturers Association of Australia
The University of New South Wales

NOTES

Australian Standard™

AS 1774.33

Refractories and refractory materials—Physical test methods**Method 33: Determination of the setting time of castables****1 SCOPE**

This Standard sets out a method for determining the initial and final set times of hydraulically bonded refractory castable.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

1774 Refractories and refractory materials—Physical test methods

1774.4.1 Method 4.1: Preparation of test pieces—By casting

2243 Safety in laboratories (series)

2780 Refractories and refractory materials—Glossary of terms

2701 Methods of sampling and testing mortar for masonry construction

4433 Guide to the sampling of particulate materials

4433.2 Part 2: Preparation of samples

3 DEFINITIONS

For the purpose of this Standard, the definitions given in AS 2780 and those below apply.

3.1 Heat of hydration

The heat evolved when a cement hydrates with water.

3.2 Exothermic maximum

The maximum temperature reached during hydration.

3.3 Initial set time

The time interval measured from the time at which water is added to the castable, to the time at which the castable is no longer workable, as indicated by the flow having decayed to half of the initial flow value.

3.4 Final set time

The time interval measured from the time at which water is added to the castable, to the time at which the cement hydration is complete, as indicated by the exothermic maximum.

4 PRINCIPLE

A specimen is prepared using a prescribed procedure. Initial set time is determined by flow measurements and the final set time is determined from heat of hydration data.

5 SAFETY

For information on safety in laboratories, reference should be made to the relevant parts of AS 2243.

6 APPARATUS

6.1 Temperature controlled area (TCA)

A room or cabinet capable of maintaining a constant temperature at the test temperature to within 1°C.

6.2 Temperature measuring equipment

Any convenient data logging equipment capable of measuring the temperature of the test specimen to an accuracy of 0.1°C at regular time intervals.

6.3 Tap flow table and mould

Complying with the requirements of AS 2701.

6.4 Vibration table

The vibrating table shall be fixed firmly to a rigid base and shall be flat, horizontal and perform only uniaxial vertical vibrations at a frequency of 50 Hz. When loaded it shall be capable of operating at a double amplitude of 0.5 mm.

6.5 Insulated mould

A 500 mL insulated mould, for example a polystyrene cup.

6.6 Timing device

A suitable stop watch.

7 PROCEDURE

7.1 Sample preparation

Prepare a suitable size batch of castable with the required water addition according to AS 1774.4.1 except that the dry material which is ready for mixing and the water shall be equilibrated at the test temperature. Start the stopwatch immediately when the water is added to the castable. Store the castable at the desired temperature in the TCA for the set time determinations.

NOTE: For guidance on sample reduction see AS 4433.2.

7.2 Determination of initial set time

The initial set time shall be determined by flow decay.

The flow determination shall be carried out according to one of the methods given in AS 1774.4.1 Appendix A, i.e. tap flow, self flow or vibration flow.

The procedure shall be as follows:

- (a) Determine the initial flow value of the castable (7.1) within one minute of completion of mixing. Determine the flow value at regular short intervals until the flow decays to less than half of the initial flow value. Record the flow values, the corresponding elapsed times and the castable temperature.
- (b) Construct a plot of flow value versus elapsed time and determine by interpolation the point where the flow is half of the initial value. Record this point as the initial set time.