

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 1774.12—2001

Refractories and refractory materials—Physical test methods

**Method 12: Refractories under load—Temperatures of deformation at constant load
with rising temperature**

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 1774.12

Refractories and refractory materials— Physical test methods

Method 12: Refractoriness under load— Temperatures of deformation at constant load with rising temperature

PREFACE

This Standard was prepared by the Standards Australia Committee MN-007, Refractories and Refractory Materials to supersede AS 1774.12—1983.

The objective of this revision is to bring the method into alignment with current practice and is based on but not equivalent to EN 993-8:1997, *Methods of test for dense shaped refractory products*, Part 8: *Determination of refractoriness-under-load*.

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a Standard.

METHOD

1 SCOPE

This Standard describes a procedure for determining the temperature(s) corresponding to specific deformations of a shaped refractory which is subjected to a constant compressive stress and an increasing temperature.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

2243 Safety in laboratories (series)

2780 Refractories and refractory materials — Glossary of terms

3 DEFINITIONS

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



4 PRINCIPLE

A cylindrical test specimen is heated, while under a constant compressive stress, at a prescribed rate of temperature increase. The changes in length of the test specimen are recorded and their absolute values calculated to allow the temperatures corresponding to specified deformations to be determined.

5 SAFETY

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

6 APPARATUS

6.1 Main apparatus

6.1.1 General description (Refer to Figure 1)

The main apparatus shall consist of a furnace, a loading device for applying an axial load which causes compression to the test specimen, a device to measure the differential change in length, and thermocouples to measure the temperature of the specimen and to control its rate of heating.

6.1.2 Furnace

The furnace shall be capable of raising the temperature of the test specimen in an oxidizing atmosphere at the specified rate. The test zone shall be not less than 75 mm in length and its temperature shall be uniform to within $\pm 10^\circ\text{C}$ as measured by the thermocouple/recorder system specified in Clauses 6.1.5 and 6.1.6.

6.1.3 Loading assembly

The loading assembly shall be capable of applying a stress of up to 350 kPa to an accuracy of 1 percent (of actual stress). The load may be applied from either above or below, along the vertical centre-line of the assembly, at all stages of the test (note that Figure 1 only shows the loading being applied from above).

The loading assembly shall consist of the following:

(a) *A loading device*

Which shall be capable of smoothly applying and maintaining the specified stress. A suitable loading device is shown in Figure 1.

(b) *A fixed column and a loading column*

Which shall be of a suitable refractory material, whose deformation during the test shall not exceed 0.5 percent of its original length. One of the columns shall have a hole of approximately 16 mm diameter through the central axis (see Figure 2).

(c) *Parting discs*

Which shall be of a material having the same specifications as given by Item (b) and shall have a diameter of between 52 mm and 55 mm and be not less than 5 mm in thickness. One disc shall have a central hole of diameter 12 ± 1 mm.

If reaction occurs between the test specimen and the disc, platinum-rhodium foil containing not less than 20 percent rhodium, and of approximately 0.03 mm thickness shall be inserted between the specimen and the disc.

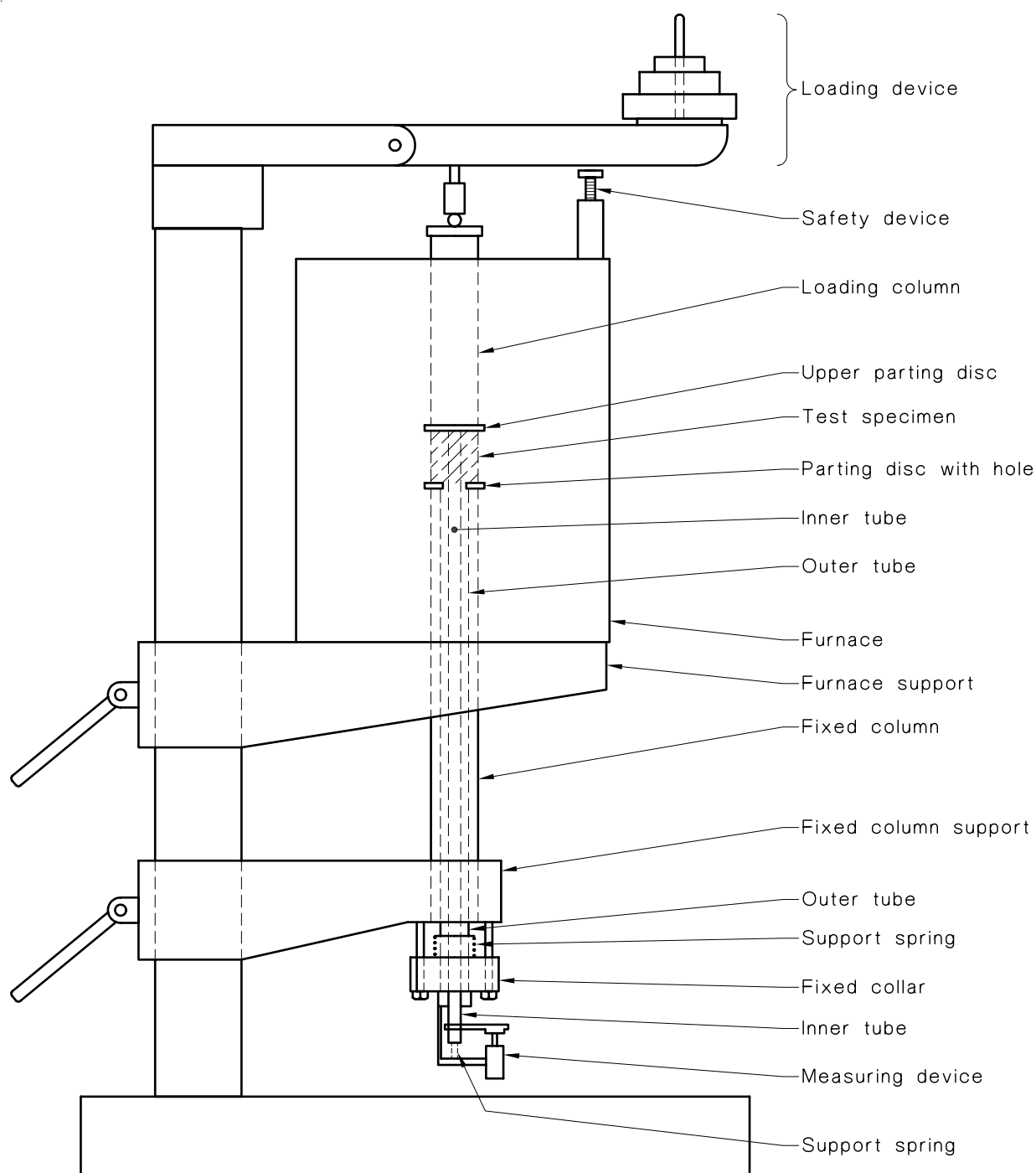


FIGURE 1 A SUITABLE ARRANGEMENT FOR THE MAIN APPARATUS LOADED FROM ABOVE