

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

METHODS FOR PHYSICAL TESTING OF
REFRACTORIES AND REFRACTORY MATERIALS

AS 1774.1
THE DETERMINATION OF COLD
COMPRESSIVE STRENGTH

1 SCOPE. This standard sets out the method for determining the cold compressive strength of refractory bricks, insulating bricks and castable and mouldable refractories.

2 PRINCIPLE. A test specimen is subjected to a constant rate of increase of compressive stress at room temperature until failure occurs.

3 DEFINITIONS. For the purpose of this standard, the following definitions apply:

3.1 Cold compressive strength—the maximum load per unit area under specified conditions that a refractory will withstand at room temperature. It is technically identical with cold crushing strength.

3.2 Bearing faces—the plane and parallel faces of the test specimen through which the compressive force is to be applied.

4 APPARATUS.

4.1 Testing Machine. Any mechanical or hydraulic compression testing machine provided that it has a sensitivity complying with Grade B of AS 2193, Methods for Calibration and Grading of Force-measuring Systems of Testing Machines, and provided that the seating of one of the platens has been designed to give axial loading.

4.2 Measuring Equipment. Any convenient equipment capable of measuring the dimensions of the test specimen to an accuracy of ± 0.1 mm.

4.3 Packing Pieces. Packing pieces shall be pasted unlined strawboard, approximately 2.4 mm thick, each side of which shall be at least 10 mm longer than the test specimen. Fresh packing pieces shall be used in each test.

4.4 Drying Oven. An oven capable of maintaining a constant temperature of 110°C to an accuracy of $\pm 5^\circ\text{C}$.

5 TEST SPECIMENS.

5.1 Dimensions. The test specimen shall comply with the following requirements according to the strength of the material:

(a) For material having a cold compressive strength less than or equal to 4 MPa, the test specimen shall retain as many original faces as possible and shall measure 115 mm \times 115 mm \times 75 mm to an accuracy of ± 5 mm. The 115 mm \times 115 mm faces shall be the bearing faces.

(b) For material having a cold compressive strength greater than 4 MPa, the test specimen shall retain as many original faces as possible and shall be a cube of which each side shall measure 75 mm to an accuracy of ± 5 mm.

NOTE: When it is not possible to comply with the requirements of (a) or (b), a smaller test specimen should be prepared complying as closely as possible with (a) or (b), as appropriate.

5.2 Bearing Faces. The bearing faces of the test specimen shall be plane, and parallel to within 0.5 mm.

5.3 Vertical Faces. These shall be parallel to the direction of application of the force to within 0.5 mm.

5.4 Marking. Each specimen shall be marked to indicate the direction in which the forming pressure was applied, if this is known.

6 PROCEDURE.

(a) Dry the test specimen at 110°C and cool to room temperature.

NOTE: Test specimens which have not been fired above 1000°C are to be tested within 24 h.