IS 8 : 1994
(Reaffirmed 2001)

भारतीय मानक

उच्च ताप हेतु फायरक्ले अग्निसह — विशिष्टि

(पांचवाँ पुनरीक्षण)

Indian Standard

HIGH HEAT DUTY FIRECLAY REFRACTORIES — SPECIFICATION

(Fifth Revision)

UDC 666·762·16

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

April 1994

Price Group 1

FOREWORD

This Indian Standard (Fifth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Refractories Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first issued in 1949 and subsequently revised in 1953, 1968, 1967 and 1983. While reviewing the standard in the light of experience gained during these years, the Committee decided to revise it to bring it in line with the present practices being followed by the Indian Industry.

Fireclay refractories are classified into 'high heat duty' and 'moderate heat duty' refractories, the latter being subdivided into two groups, namely, Group A and Group B on the basis of certain well-established properties. This standard deals with high heat duty fireclay refractories.

In this revision, the following changes have been made:

a) The requirements for alumina content of refractories have been modified.

b) Physical test requirements have been modified.

It is to be pointed out that though a number of tests have been prescribed in this standard, it is not intended that all of them should be carried out in each case, as by a judicious application of some of the tests it should be possible to judge the quality of bricks in a given lot. However, the tests to be conducted in each case would depend upon the service conditions for which the bricks are required, and purchasers are advised to indicate these conditions at the time of placing an indent or order.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value n this standard.

Indian Standard

HIGH HEAT DUTY FIRECLAY REFRACTORIES — SPECIFICATION

(Fifth Revision)

1 SCOPE

This standard covers the requirements for two types of high heat duty burnt fireclay refractories for general purposes.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
1335 : 1979	Methods for direct determination of alumina in refractory materials (*first revision*)
1387 : 1993	General requirements for the supply of metallurgical materials (*second revision*)
1527 : 1972	Methods of chemical analysis of high silica refractory materials (*first revision*)
1528	Methods of sampling and physical tests for refractory materials
1528 (Part 1) : 1980	Part 1 Determination of pyrometric cone equivalent (PCE) or softening point (*first revision*)
1528 (Part 2) : 1974	Part 2 Determination of refractoriness under load (*first revision*)
1528 (Part 3) : 1983	Part 3 Determination of spalling resistance (*second revision*)
1528 (Part 4) : 1974	Part 4 Determination of cold crushing strength (*first revision*)
1528 (Part 6) : 1974	Part 6 Determination of permanent change after reheating (*first revision*)
1528 (Part 7) : 1974	Part 7 Methods of sampling and criteria for conformity (*first revision*)
1528 (Part 8) : 1974	Part 8 Determination of apparent porosity (*first revision*).

3 SUPPLY OF MATERIALS

3.1 General requirements relating to the supply of high heat duty fireclay refractories shall be as laid down in IS 1387 : 1993.

3.2 The refractories shall be compact, of homogeneous texture and free from cracks, voids and other flaws. They shall be burnt evenly throughout, shall have no soft corners and have sufficient mechanical strength.

4 TYPES

High heat duty fireclay refractories shall be of the following two types:

Type 1 — Suitable for general applications, and

Type 2 — Suitable for more critical applications.

5 CHEMICAL COMPOSITION

5.1 The alumina content of both Type 1 and Type 2 refractories when determined in accordance with the methods given in IS 1527 : 1972 or 1335 : 1979 shall be not less than 38 percent.

5.2 Provided that such of the physical properties like refractoriness under load and linear changes after reheating which are considered essential for the particular service conditions are satisfactory, the stipulation regarding alumina content may be waived subject to the agreement between the purchaser and the manufacturer for both Type 1 and Type 2 refractories.

6 PHYSICAL TEST REQUIREMENTS

High heat duty fireclay refractories with tested in accordance with the test methods specified in relevant parts of IS 1528 shall conform to the requirements given in Table 1.

7 TOLERANCE ON SIZE

7.1 Variation from specified dimensions, covering both warpage and shrinkage, shall be allowed to the extent of ± 2 percent or ± 1 mm whichever is greater for Type 1 refractories and ± 1 percent or ± 1 mm whichever is greater for Type 2 refractories.

7.2 The size tolerance for hand moulded shape shall be subject to mutual agreement between the purchaser and the manufacturer.

8 SAMPLING

Representative samples shall be drawn according to the scheme of sampling given in IS 1528 (Part 7) : 1974 for carrying out test specified in the standard.

9 MARKING

9.1 Each refractory brick or shape shall be legibly and indelibly marked with the manufacturer's name or trade mark.

9.2 BIS Certification Marking

The material may also be marked with the Standard Mark.

9.2.1 The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Table 1 Physical Test Requirements

(*Clause* 6)

Sl No.	Characteristics	Requirements		Test Method (Ref to Part of IS 1528)
		Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)
i)	Apparent porosity percent, *Max*	25 27 (for hand moulded shapes)	23 25 (for hand moulded shapes)	Part 8
ii)	Cold crushing strength, MPa, *Min*	20 15 (for hand moulded shapes)	25 20 (for hand moulded shapes)	Part 4
iii)	Pyrometric cone equivalent standard cone (ASTM) No., *Min*	32	32	Part 1
iv)	Refractoriness under load ta°C, *Min*	1 400	1 425	Part 2
v)	Permanent linear change after heating at 1 450°C for 2 h, percent, *Max*	±1·5	±1·0	Part 6
vi)	Spalling resistance	Subject to mutual agreement	Subject to mutual agreement	Part 3

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This Indian Standard has been developed from Doc : No. MTD 15 (3907).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Printed at Printrade, New Delhi, India