IS 8920 (1978): Methods for sampling of burnt clay tiles [CED 30: Clay and Stabilized Soil Products for Construction]

BLANK PAGE

Indian Standard

METHODS FOR SAMPLING OF BURNT CLAY TILES

Building Materials and Components Sampling Sectional Committee, BDC 31

Chairman

SHRI G. D. JOGLEKAR
Telegaon (Dist Pune)

Members	*Representing*
SHRI J. S. BEDI	Doors, Windows and Shutters Sectional Committee, BDC 11, ISI
SHRI A. K. SOBTI (*Alternate*)	
SHRI B. B. BHATTACHARJEE	Concrete Reinforcement Sectional Committee, BSMDC 8, ISI
SHRI T. SEN (*Alternate*)	
SHRI J. D. DAROGA	Italab Engineering Pvt Ltd, Bombay
SHRI N. R. PATRAWALA (*Alternate*)	
SHRI K. H. GANDHI	Directorate General of Inspection (Ministry of Defence), New Delhi
SHRI SAT PAL SINGH (*Alternate*)	
SHRI S. K. GURNANI	Railway Board (Ministry of Railways)
SHRI M. S. EKBOTE (*Alternate*)	
SHRI P. J. JAGUS	Pozzolanas Sectional Committee, BDC 16, ISI
SHRI M. R. VINAYAKA (*Alternate*)	
SHRI K. P. JAIN	Builder's Hardware Sectional Committee, BDC 15, ISI
SHRI KARAMJIT SINGH	Central Public Works Department, New Delhi
SHRI K. K. KHANNA	Construction Plant and Machinery Sectional Committee, BDC 28, ISI
SHRI A. C. MANNAN (*Alternate*)	
DR T. KRISHNAN	Indian Statistical Institute, Calcutta
SHRI S. R. KSHIRSAGAR	Sanitary Appliances and Water Fittings Sectional Committee, BDC 3, ISI
SHRI R. P. MISHRA (*Alternate*)	
SHRI N. C. MAJUMDAR	Clay Products for Building Sectional Committee, BDC 30, ISI
SHRI M. R. MALYA	Bitumen and Tar Products Sectional Committee, BDC 2, ISI
SHRI S. K. DUTTA (*Alternate*)	
COL Y. P. MISRA	Wool Products Sectional Committee, BDC 20, ISI

(*Continued on page* 2)

(*Continued from page* 1)

Members	*Representing*
DR MOHAN RAI	Central Building Research Institute (CSIR), Roorkee
SHRI R. K. GOEL (*Alternate*)	
DR A. K. MULLICK	Cement Research Institute of India, New Delhi
DR M. PANCHOLY	Sieves Sectional Committee, BDC 19, ISI
SHRI S. S. RAJPUT	Forest Research Institute and Colleges, Dehra Dun
SHRI E. K. RAMACHANDRAN	National Test House, Calcutta
LALA G. C. DAS (*Alternate*)	
SHRI N. MOHAN RAO	Research and Development Organization (Ministry of Defence), New Delhi
SHRI V. B. GHORPADE (*Alternate*)	
SHRI A. C. SEKHAR	Timber Sectional Committee, BDC 9, ISI
SHRI C. A. TANEJA	Gypsum Building Materials Sectional Committee, BDC 21, ISI
DR B. N. SINGH, Director (Stat)	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI N. C. TYAGI
Deputy Director (Stat), ISI

Indian Standard

METHODS FOR SAMPLING OF BURNT CLAY TILES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 23 August 1978, after the draft finalized by the Building Materials and Components Sampling Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Clay tiles are extensively used in flooring, roofing, roof finishing and lining works. With the adoption of complete mechanized plants in the production of clay products, these tiles will be produced in larger numbers and will find greater application in general building construction. It is, therefore, imperative that due consideration is given to the sampling procedures which would help in proper and objective evaluation of the quality of the clay tiles. This standard, prepared at the instance of the Clay Products for Building Sectional Committee, lays down the methods for sampling of clay tiles as duly evolved on the basis of the statistical principles and practical considerations.

0.3 The procedures for sampling of different types of clay tiles have been indicated in the respective material specifications. However, in view of the experience gained in course of years, it was felt necessary to revise these methods and unify them into a separate single standard so as to give more details of sampling for the various characteristics constituting the quality of clay tiles. It is hoped that this standard would help in the development of proper sampling of clay tiles in the country.

0.4 In reporting the results of a test or analysis, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

1. SCOPE

1.1 This standard prescribes the methods for sampling and criteria for conformity of burnt clay tiles.

2. TERMINOLOGY

2.1 Lot — A collection of clay tiles of the same type and size manufactured under relatively similar conditions of production. For the purpose

*Rules for rounding off numerical values (*revised*).

of sampling of clay tiles a lot shall contain a maximum of 50 000 tiles. In case a consignment has tiles more than 50 000 of the same type and size, and manufactured under relatively similar conditions of production, it shall be divided into lots of 50 000 tiles or part thereof.

2.2 Sample — Group of tiles drawn from a lot for inspection and/or testing.

2.3 Defective — A tile the quality of which does not meet the specified requirements.

2.4 Average — The sum of the observations divided by the number of observations and denoted by $\bar{x}$.

2.5 Range — The difference between the maximum and the minimum observations.

3. SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY FOR VISUAL AND DIMENSIONAL CHARACTERISTICS

3.1 Sample shall be selected and inspected for each lot separately for ascertaining its conformity to the requirements of the relevant specification.

3.1.1 The number of tiles to be selected for the sample from a lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 1. All these tiles shall be selected following the methods detailed in **5**.

TABLE 1 SCALE OF SAMPLING AND PERMISSIBLE NUMBER OF DEFECTIVES

(*Clauses* 3.1.1, 3.2 *and* 4.1)

No. of Tiles in the Lot	No. of Tiles to be Selected in the Sample	Permissible No. of Defective Tiles in the Sample	No. of Tiles to be Tested for Physical Characteristics
(1)	(2)	(3)	(4)
Up to 1 000	20	1	3
1 001 ,, 3 000	32	2	5
3 001 ,, 10 000	50	3	8
10 001 ,, 35 000	80	5	10
35 001 ,, 50 000	125	7	13

3.2 Criteria for Conformity — All the tiles selected as in **3.1.1** shall be inspected for visual, dimensional, weight and warpage characteristics,

wherever applicable, in accordance with the relevant material specification. If the number of defective tiles found in the sample is less than or equal to the corresponding number as specified in col 3 of Table 1, the lot shall be considered as satisfying the requirements of these characteristics. However, if the number of defective tiles in the sample is greater than the corresponding permissible number of defectives, the lot shall be deemed as not having met the requirements of these characteristics.

4. SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY FOR PHYSICAL REQUIREMENTS

4.1 The lot which has been found satisfactory in respect of visual and dimensional requirements (*see* **3.2**) shall next be tested for physical characteristics like compressive strength, transverse strength or flexural strength or breaking load, impact test, water absorption and permeability, whichever are applicable. The tiles for this purpose shall be taken at random from those already selected, tested and found non-defective under **3.1.1** and **3.2**. The number of tiles to be selected and tested for each of the physical characteristics specified in the relevant material specification shall be in accordance with col 4 of Table 1.

4.2 Criteria for Conformity for Impact Test and Permeability — In the case of impact test and permeability all the tiles tested under **4.1** shall pass the requirements of the relevant tests, otherwise the lot shall not be declared as conforming to the requirements of these characteristics.

4.3 Criteria for Conformity for Other Physical Characteristics — In case of the other physical characteristics, namely, compressive strength, transverse strength or flexural strength or breaking load and water absorption, from the test results (separately for each test) the average $\bar{x}$ and the range (R) shall be calculated.

NOTE — In case the number of test results is 10 or more, $\bar{R}$ shall be calculated and used in place of R ; $\bar{R}$ being the average of the ranges, R, calculated for the sub-groups of five test results.

4.3.1 If the specification limit for the characteristics is given as a minimum, then the value of the expression ($\bar{x} - 0{\cdot}4R$) shall be calculated from the relevant test results. If the value so obtained is greater than or equal to the minimum limit, the lot shall be declared as conforming to the requirements of that characteristic.

4.3.2 If the specification limit for the characteristic is given as a maximum, then the value of the expression ($\bar{x} + 0{\cdot}4R$) shall be calculated from the relevant test results. If the value so obtained is less than or

equal to the maximum limit, the lot shall be declared as conforming to the requirements of that characteristic.

5. METHODS OF SAMPLING

5.1 The sample may be drawn in accordance with IS : 4905-1968* either by : (a) simple random sampling, or by (b) stratificd sampling method.

5.1.1 In simple random sampling the sample is taken in such a way that every tile in the lot has the same chance of appearing in the sample.

5.1.2 In stratified sampling the lot is divided into convenient sections (real or imaginary) and the sample is taken from each section of the lot at random.

5.2 The sample shall be taken by one of the methods given in **5.2.1** and **5.2.2,** sampling being arranged so as to yield the number of tiles required in the sample. Tiles damaged in handling or transit shall not be taken as samples.

5.2.1 *Sampling in Motion* — Whenever practicable a sample shall be taken while the tiles are being moved, for example, during loading or unloading. The lot shall be divided into a number of convenient portions (not less than ten) such that when equal number of tiles are drawn from each of these portions the number of tiles required for the inspection and testing is provided. Alternatively the required number of sample tiles may be obtained by picking an equal number of tiles at regular intervals as the lot is being moved. To make the start in a random manner, the procedure shall be adopted. From the random number tables given in IS : 4905-1968* a random number shall be chosen which shall be less than the number constituting the sampling interval. The sampling shall start by picking the tile whose serial number in the lot corresponds to this random number. Subsequently, the tiles shall be picked up at the chosen interval.

5.2.2 *Sampling from Stack* — When it is necessary to take a sample from a stack, the stack shall be divided into a number of real or imaginary sections and the required number of tiles drawn from each section as indicated in **5.2.1**. The stacks should be accessible from all sides. The maximum height of the stack should be 1·5 m. The width of the stack should be twice the maximum dimension of the tile. For this

*Methods for random sampling.

purpose tiles in the upper layer of the stack shall be removed to enable tiles to be sampled from places inside the stack.

5.2.3 *Sampling from Wagons, Trucks, and Shipholds* — In case of tiles loaded in wagons/trucks/shipholds if it becomes necesary for any reason to take samples in that state, the tiles for the sample shall be taken at random from a number of wagons/trucks/shipholds in such a way that when equal number of tiles are drawn from each of wagons/trucks/shipholds the number of tiles required for the inspection and testing is provided.

AMENDMENT NO. 1 JULY 1980

TO

IS:8920-1978 METHODS FOR SAMPLING OF BURNT CLAY TILES

Corrigenda

(*Page 4, Table 1, col 4, last entry*) - Substitute '15' *for* '13'.

(*Page 6, clause 5.2.1, line 9*) - Substitute 'following procedure' *for* 'procedure'.

(BDC 31)

Reprography Unit, ISI, New Delhi