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भारतीय मानक

सीमेन्ट परीक्षण के लिए मानक रेत — विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

STANDARD SAND FOR TESTING CEMENT — SPECIFICATION

(Second Revision)

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

May 1991

Price Group 2

Cement and Concrete Sectional Committee, CED 2

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Cement and Concrete Sectional Committee had been approved by the Civil Engineering Division Council.

As a standard fine aggregate used for assessing the quality of cement, standard sand plays a very important role in the cement industry. The importance of a standard sand in industrial economy is evident from the fact that it is required not only as a testing material in the cement industry but also as a standard material to study the properties of other building materials like lime and pozzolanas, various admixtures to cement and also as a standard material for determining the abrasive resistance of different substances, such as building stones. Till the year 1955, the country's requirements for standard sand were met by importing Leighton-Buzzard sand from the United Kingdom. The difficulties and expense of importing this standard sand from UK led to an investigation to replace Leighton-Buzzard sand by an Indian Standard sand.

While formulating the standard for Portland cement, the Committee also felt the necessity of establishing an indigenous standard sand as early as possible. As a result of extensive survey and research carried out by many organizations, namely, Geological Survey of India; Industrial Research Bureau; National Test House; Concrete and Soil Research Laboratory, Chepauk, Madras; Hirakud Research Station; Hyderabad Engineering Research Laboratory; the laboratories of the Associated Cement Companies Ltd; and Dr Lal C. Verman, it was found that the white variety of sand available at Ennore, Madras State, was very pure in nature and suitable for use as a standard sand. The thoroughly washed sand passing 850-micron IS Sieve and retained on 600-micron IS Sieve was observed to satisfy the requirements of standard sand as a substitute for the imported sand. Accordingly, the Sectional Committee formulated IS 650 : 1955 which recommended Ennore sand passing 850-micron IS Sieve and not more than 10 percent by mass passing 600-micron IS Sieve. This grading was the same as that for Leighton-Buzzard sand.

In the light of experience gained with the practical use of Indian Standard sand (conforming to IS 650 : 1955) for testing the compressive and tensile strength of Indian cement over the period, certain drawbacks were observed in respect of compressive and tensile strength values, the quantity of gauging water and the reproducibility of results. The Sectional Committee was of the view that these drawbacks could be overcome by revising the grading of Ennore sand. On the recommendations of the Sectional Committee, the Council of Scientific and Industrial Research sponsored the scheme of investigations on 'Mortar making properties of Ennore sand' to be carried out at the Concrete and Soil Research Laboratory, Madras under the guidance of the then ISI with the following main objects:

a) To determine the optimum grading of Ennore sand which would give the highest strength keeping at the same time, the yield from the quarry as high as possible; and

b) To introduce one or more intermediate size requirement in the grading specification with a view to controlling uniformity of grading and thus to ensure better reproducibility of results.

As a result of the above investigations, and on the recommendations of the Concrete and Soil Research Laboratory, Madras, the Sectional Committee decided to revise the grading of Ennore sand to make it more suitable from the technical and exploitation point of view and also to bring it in line with the RILEM CEMBUREAU grading of sand for testing of cement recommended by the International Organization for Standardization (ISO). First revision of the standard was printed in 1966 mainly with a view to incorporating the revised grading of standard sand.

The Sectional Committee records its deep appreciation to all those who have assisted in the important investigations related to regrading of the standard sand and in particular to the Concrete and Soil Research Laboratory, Madras; the Central Road Research Institute, New Delhi; Engineering Research Laboratory, Hyderabad; Maharashtra Engineering Research Institute, Nasik; and the laboratories of various cement factories in the country.

(*Continued on third cover*)

Indian Standard

STANDARD SAND FOR TESTING CEMENT — SPECIFICATION

(Second Revision)

1 SCOPE

This standard lays down requir ements for Standard sand used in testing of cement.

2 REFERENCES

The Indian Standards listed below are necessary adjuncts to this standard:

IS No.	*Title*
265 : 1987	Hydrochloric acid (*third revision*)
460 (Part 1) : 1985	Test sieves : Part 1 Wire cloth test sieves (*third revision*)
10036 (Part 2) : 1982	Jute canvas : General requirements

3 SOURCE

The standard sand shall be obtained from Ennore, Tamil Nadu. Particle size greater than 1 mm of the Standard sand may also be obtained from Mudaliarkuppam, Tamil Nadu (*see* Note).

NOTE — Supplies of the standard sand may be obtained from Tamil Nadu Minerals Ltd, 31, Kamarajar Salai, TWAD Board Buildings, Chepauk, Madras 600 005.

4 PHYSICAL CHARACTERISITICS

4.1 The standard sand shall be of quartz, light grey or whitish variety and shall be free from silt. The sand grains shall be angular, the shape of the grains approximating to the spherical form; elongated and flattened grains being present only in very small or negligible ,quantities.

4.2 The standard sand shall (100 percent) pass through 2-mm IS sieve and shall be (100 percent) retained on 90-micron IS Sieve with the following particle size distribution:

Particle Size	*Percent*
Smaller than 2 mm and greater than 1 mm	33·33
Smaller than 1 mm and greater than 500 microns	33·33
Below 500 microns but greater than 90 microns	33·33

NOTE — The sieves shall conform to IS 460 (Part 1) : 1985.

5 CHEMICAL REQUIREMENTS

5.1 The standard sand shall be free from organic impurities. The loss of mass on extraction with hot hydrochloric acid of rd 1·16 (conforming to IS 265 : 1987) shall not be more than 0·250 percent when tested as per **5.1.1**.

5.1.1 The sand shall be dried at 100°C for one hour. Two grams of the sand shall be transferred to porcelain dish and 20 ml of hydrochloric acid and 20 ml of distilled water added to it. This shall be heated on a water bath for one hour. It shall then be filtered, washed well with hot water, dried and ignited in a covered crucible. The mass of the residue shall be determined and the loss in mass calculated.

6 DELIVERY

Each size fraction (*see* **4.2**) of the standard sand shall be packed separately in 50 kg or 25 kg jute canvas bags [jute canvas conforming to IS 10036 (Part 2) : 1982] or metal containers and sealed properly. The particle size of standard sand shall be clearly and indelibly marked on each bag/container. Each supply shall contain equal quantities of each of the fractions.

7 MARKING

Standard sand may also be marked with the Standard Mark.

NOTE — If the standard sand is not covered by the Standard Mark, a Certificate of conformity from the Concrete and Soil Research Laboratory, Government of Tamil Nadu, Chepauk, Madras stating that the material conforms to the requirements of this specification in all respects, shall be kept inside each bag/container.

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(*Continued on page* 3)

(*Continued from page* 2)

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This revision has been taken up with a view to incorporating various amendments issued to this standard from time to time in view of changes required in clauses on source of standard sand, packing and marking.

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 in this standard.

Bureau of Indian Standards

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Review of Indian Standards

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This Indian Standard has been developed from Doc: No. CED 2

Amendments Issued Since Publication

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