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इमारती चूने को बुझाने और पुटीन तैयार करने की रीति संहिता

(दूसरा पुनरीक्षण)

Indian Standard

FIELD SLAKING OF BUILDING LIME AND PREPARATION OF PUTTY — CODE OF PRACTICE

(Second Revision)

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BUREAU OF INDIAN STANDARDS
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Price Group 2

Building Limes and Lime Products Sectional Committee, CED 4

FOREWORD

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

Slaking of quicklime is an essential operation in the preparation of lime at site for use in building construction, where standard hydrated lime is not readily available. Improper slaking results in serious defects in mortars and plasters and subsequent maintenance work will be difficult and elaborate. Therefore, in the interest of sound construction, wherever lime is used, its complete slaking should be ensured. This standard intended to give necessary guidance for field slaking of lime so as to achieve this objective.

Quicklime can never be used as such for structural purposes; it must always be slaked first. Slaking of calcium oxide results in calcium hydroxide. The method of slaking is an important factor in determining the quality of the finished products.

This standard was first published in 1960 and subsequently revised in 1975. This present revision has been taken up based on the experience gained with the use of this standard in order to bring the required modifications in the slaking methods.

Indian Standard

FIELD SLAKING OF BUILDING LIME AND PREPARATION OF PUTTY — CODE OF PRACTICE

(Second Revision)

1 SCOPE

This standard covers field slaking of limes and preparation of putty of Class B, C, D and F type of lime.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
460 (Part 1) : 1985	Specification for test sieves : Part 1 Wire cloth test sieves (*third revision*)
712 : 1984	Specification for building limes (*third revision*)
6508 : 1988	Glossary of terms relating to building lime (*first revision*)

3 TERMINOLOGY

For the purpose of this standard the definition of terms given in IS 6508 : 1988 and classification of lime given in IS 712 : 1984 shall apply.

4 NECESSARY INFORMATION

The following information is necessary for properly planning slaking operation:

a) Class of lime;

b) Slaking properties (slow, fast, etc); and

c) End use of the lime.

5 STORAGE OF QUICKLIME BEFORE SLAKING

Quicklime deteriorates rapidly on exposure by taking up moisture and carbon dioxide from atmosphere. It should be slaked as soon as possible after the production of lime at kiln before any deterioration sets in. If unavoidable, it may be stored in air-tight metal containers or polyethylene lined jute bags so as to have minimum exposed area. The drums or polyethylene lined jute bags should be stored in a shed so that it is properly protected from dampness and also covered properly to avoid direct contact with rain.

6 SLAKING QUICKLIME AND PREPARATION OF PUTTY

6.1 Preliminary Cleaning

The slaking receptacle or platform shall first be cleaned of all unslaked stones of lime and other materials left over from previous slaking.

6.2 Slaking Procedure

The slaking shall be done either in tanks by adding 'lime to water' as described in **6.2.1** or on platform by adding 'water to lime' as described in **6.2.2.**

NOTE — Tank slaking is desirable as in platform slaking it may not be possible to properly slake the lime.

6.2.1 *Tank Slaking*

This method directly results in lime putty and is thus suitable when the end product is required in this form. The tank shall be water tight and large enough to permit stirring of mix. Its sides and bottom shall be lined with a material which is not attacked by lime. Brick lining is recommended.

6.2.1.1 For providing continuous slaking operation at site, two tanks may be used, one 400 mm deep at a higher level above ground and other 750-800 mm deep at a lower level below ground. The slaking operation of quicklime is done continuously in the higher tanks and the resultant milk of lime is allowed to flow, through 3·35 mm IS Sieve [*see* IS 460 (Part 1) : 1985] into the lower tank where it will settle and mature into putty (*see* Fig. 1). The sieve shall be cleaned, as and when required, to avoid clogging of the apertures. To obtain a continuous supply of lime putty, two tanks instead of one may be provided at the lower level and used alternatively so that when putty is being used from one, fresh putty may be formed in the other.

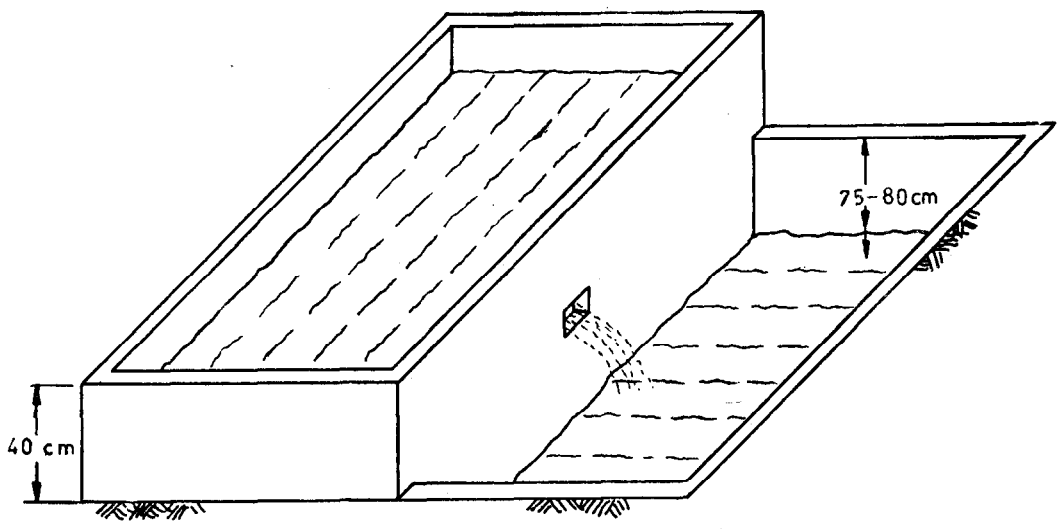

FIG. 1 SLAKING TANK

6.2.1.2 The higher tank is first filled with water to a depth of about 300 mm and quicklime is gradually added to it so as to cover the entire bottom of the tank to about half the depth of water. While quicklime is being added, water shall be constantly stirred. No part of lime shall be allowed to get exposed above the water.

It is important that in tank slaking, lime should be added to water and not water to lime. As lime slakes with evolution of heat, water begins to boil. More lime and water may be added till the requisite quantity of lime has been slaked. After the apparent slaking is over, stirring should be continued for some time further to make sure that the whole of the lime has been fully slaked.

Milk of lime thus formed is allowed to flow through a 3·35 mm IS Sieve into the lower tank where it is allowed to settle by standing undisturbed so as to form what is putty. Where only one tank is used, the slaked lime is allowed to stand undisturbed in tank. Milk of lime during this process looses moisture by evaporation and absorption and thus thickens. For maturing of lime putty at least 3 days should be allowed in case of fat lime (class C and D) but not more than 2 days in case of semihydraulic lime (class B and F.). This ensures complete slaking and at the same time improves the workability. Lime putty should not be allowed to dry or stiffen till it is used.

6.2.2 *Platform Slaking*

This method of slaking converts the quicklime into dry hydrated lime powder which can be used as it is or after converting it into putty (*see* **6.2.2.1**). In this process quicklime is spread in 150 mm thick layer on a water-tight masonry platform and water is sprinkled over it in small quantities through a rose can or with a hose pipe until lime disintegrates into a fine powder. As water is added, the heap of lime is turned over and over. Care should be taken that minimum quantity of water is added as is required for complete slaking. Slaking should be allowed to continue further by itself for a period of about 24 hours or so. It should then be screened through a 3·35 mm IS Sieve. Slaked lime should be stored in a dry place under cover or may be packed in polyethylene lined gunny bags, well protected from rain.

6.2.2.1 *Preparation of putty*

The putty, if required, shall be obtained by adding dry slaked lime to water and stirring to the consistency of a thick cream and allowing it to stand and mature for a period which shall be not less than 16 hours in the case of Class C and D limes, and not more than 12 hours in the case of Class B and F limes before using it as slaked lime.

7 STORAGE OF BUILDING LIME AFTER SLAKING

7.1 Dry Slaked/Hydrated Lime

If the dry slaked lime is to be used within a few days, it may be stored on the platform suitably covered for protection from rain and wind. If it is required to be stored for a longer period not exceeding 2 months, it may be bagged in polyethylene lined gunny bags, properly stitched and kept in a dry and closed godown.

7.2 Putty

The lime putty shall always be stored under water. The lime putty shall be used as soon as possible after preparation.

8 PRECAUTIONS

8.1 Quicklime during slaking reacts violently with water liberating an enormous amount of heat. Hence suitable precautions against fire hazard shall be taken when slaking quicklime. Quicklime before slaking shall not be allowed to come in contact with water during storage, handling or transit.

8.2 Dust from lime may be irritating if inhaled, though it does not cause abnormal lung conditions; those who regularly work with such limes may be provided with goggles for protection of eyes and suitable respirators for protection of nose, throat and lungs.

8.3 Quicklime particles may cause burns on skin particularly if the skin is moist. This problem would be rather serious in warm and humid localities where there would be much perspiration. Skin protecting cream may be provided to the workers in addition to goggles and respirators. They may also be provided with gum boots and gloves made of rubber.

8.4 Washing the face and skin with fresh water will reduce considerably the irritation after working in an atmosphere of lime dust.

8.5 Freshly slaked lime, while hot, may produce skin burns. The workmen, who regularly work with milk of lime, should be instructed to oil their skin daily least they develop skin cracks leading to possible infection.

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