

Indian Standard

**GLOSSARY OF TERMS RELATING TO
BUILDING LIME**

(First Revision)

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0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards on 9 May 1988, after the draft finalized by the Building Lime and Lime Products Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 A series of Indian Standards on lime and lime based products for construction purposes have been prepared and these standards include a large number of technical terms. Besides, there are a number of common terms relating to this field

which are frequently used. This glossary has therefore, been prepared so as to compile definitions of all such terms in one standard which would be handy for day-to-day use.

0.3 This standard was first published in 1972. This present revision has been taken up with a view to modifying some of the existing terms to give them precise meaning and including some additional terms which are being used in connection with the subject.

1. SCOPE

1.1 This standard covers definition of terms relating to manufacturing, testing and use of lime for constructional purposes.

2. DEFINITIONS

2.1 Air-Slaked Lime — The product containing various proportions of the oxides, hydroxides and carbonates of calcium and magnesium which result from the excessive exposure of quicklime to the atmosphere.

2.2 Autoclaved Lime — It is a specially hydrated dolomitic lime, largely utilized for structural purposes, that has been pressure hydrated in an autoclave.

2.3 Autogenous Healing in Lime Mortars — It is a phenomenon occurring in lime mortars due to formation of calcium carbonate by absorption of atmospheric carbon dioxide by hydrated lime, resulting in the bridging of minor cracks and/or the air spaces at the joints in the masonry.

2.4 Available Lime — It represents the total lime in quick and hydrated form which enters into a desired reaction under specified reaction conditions.

2.5 Building Lime — A lime whose chemical and physical characteristics and methods of processing make it suitable for construction purposes, also known as 'construction lime'.

2.6 Burning — The overheating of lime particles due to inadequate addition of water during slaking.

2.7 Calcia — Chemical name of CaO.

2.8 Calcination Zone — The portion of the kiln in the middle section where the limestone gets calcined.

2.9 Carbide Lime — This is essentially calcium hydroxide obtained as an industrial waste in the production of acetylene from calcium carbide. It may occur as a wet sludge.

2.10 Charge — Limestone, limeshell and other calcareous materials (and fuel in case of mixed feed kiln) fed into the kiln.

2.11 Compaction in Lime Mortar — It is the volume change that occurs when water is drawn from the mortar by placing a porous building material. It occurs before hardening, that is during stiffening of mortar.

2.12 Composite Mortar — A mortar in which cement is included as an ingredient in addition to lime.

2.13 Construction Lime — See 2.5.

2.14 Cooling Zone — The bottom portion of the kiln where the burnt lime is cooled by the incoming air required for combustion of the fuel.

2.15 Core — The central unburnt portion of the calcined lump lime.

2.16 Dead Burnt Lime — Quicklime burnt under conditions where it becomes predominantly non-reactive. This is also known as 'hard-burnt lime' or 'over-burnt lime' (see 2.22 and 2.53).

2.17 Drowning — The incomplete and retarded slaking of slow-slaking lime due to excessive addition of water. This occurs due to formation of an impervious layer of hydrate on the surface of the lime pebble and due to rapid loss of temperature before the quicklime particles rupture.

2.18 Eminently Hydraulic Lime — Lime in which the constituents like silica, alumina and iron oxide are present as calcium compounds capable of reacting with water and giving rise to strength giving compounds. This has the property of setting and hardening under water (see 2.25).

2.19 Exit Gas — The mixture of hot gases exhausted from the kiln consisting chiefly of carbon dioxide, water vapour, nitrogen, oxygen and a small percentage of carbon monoxide.

2.20 Fat Lime — It connotes a pure non-hydraulic lime containing a minimum of 79 percent CaO on ignited basis.

2.21 Finishing Lime — It is a type of refined hydrated lime suitable for plastering, particularly the finishing coat.

2.22 Hard-Burnt Lime — See 2.16 and 2.53.

2.23 Hydrated Lime — A dry powder obtained by treating quicklime with water enough to satisfy its chemical affinity for water under the condition of its hydration.

2.24 Hydraulic Lime — See 2.18 and 2.65.

2.25 Hydrated Hydraulic Lime — Lime obtained by hydrating Class A, B and E lime, and containing all the hydraulic components, that is, lime combined with silica, alumina and iron as hydroxide.

2.26 Kankar — The impure earthy hard lump consisting of concretions and nodules of calcium carbonate.

2.27 Kankar Lime — Lime obtained by calcination of *Kankar*.

2.28 Kiln Dust — Dust drawn from the bottom of the kiln which, in a mixed-feed kiln, is generally composed of coal ash, air slaked lime and unslaked lime dust.

2.29 Kiln Shell — The outer wall which forms the structural enclosure for the kiln.

2.30 Lime — It is a general term that connotes only a burnt form of lime, usually quicklime, but may also refer to hydrated or hydraulic lime.

2.31 Limestone — Rock composed predominantly of calcium carbonate.

2.32 Lime-Cement-Cinder-Hollow Blocks — The hollow blocks made from lime, ordinary Portland cement or Portland slag cement and cinder, which are used in the construction of walls.

2.33 Lime-Cement-Cinder-Solid Blocks — The solid blocks made from lime, ordinary Portland cement or Portland slag cement and cinder, which are used in the construction of walls.

2.34 Lime Mortar — A mixture of lime, fine aggregate and water with or without addition of admixtures.

2.35 Lime-Cement Mortar — A mixture consisting of lime, cement, sand and water in suitable proportions.

2.36 Lime-Pozzolana Mixture — A mixture manufactured either by intergrinding lime and pozzolana in suitable proportions in a ball or tube mill, or by blending these two ingredients in the form of powder of required fineness adopting suitable measures for obtaining a uniform mixture of the required proportions.

2.37 Lime-Pozzolana Mixture Mortar — A mixture consisting of lime-pozzolana mixture, sand and water in suitable proportions.

2.38 Lime Pozzolana Mortar — A mortar consisting of lime, pozzolana, sand and water in suitable proportions.

2.39 Lime-Pozzolana Mixture Concrete — A mixture consisting of lime-pozzolana mixture, fine aggregate, coarse aggregate and water in suitable proportions.

2.40 Lime Concrete — A mixture of lime, fine aggregate, coarse aggregate and water (with or without additives) in suitable proportions.

2.41 Lime Plaster — A mixture of lime and other materials applied in substantial thickness to surfaces to form a protective and/or decorative coating.

2.42 Lime Putty — A plastic paste consisting of hydrated lime and free water.

2.43 Lime Slurry — A suspension of hydrated lime in considerable amount of free water, with a consistency similar to cream.

2.44 Lime Soil Stabilization — The process in which lime is added to soil to improve its engineering properties, that is, strength, durability, etc, commonly adopted for road construction.

2.45 Lining — The refractory layer placed on the inner face of the lime kiln.

2.46 Lump Lime — It is a physical shape of quicklime not less than 63 mm in size (see 2.59).

2.47 Maturing — The keeping of slaked lime until all particles of lime fatten up to lime putty. This is also sometime known as fattening.

2.48 Magnesian and Dolomitic Lime — Lime obtained from magnesian and dolomitic limestones or dolostones which shall contain more than 6 percent magnesium oxide (ignited basis).

2.49 Masonry Kiln — A kiln having its outer shell constructed of brick or stone masonry.

2.50 Milk of Lime — A suspension of lime in a large amount of water with a consistency similar to milk.

2.51 Mixed Feed — The process of burning in which the solid fuel and the calcareous material are mixed before charging; or in which the charge is fed in alternate layers of fuel and calcareous material.

2.52 NEERU Finish — A type of finish in which a fine lime putty coat with or without 'additives' is applied and rubbed and polished to a smooth and even finish.

2.53 Over-Burnt Lime — See 2.22.

2.54 Pebble Lime — It is a physical shape of quicklime less than 63 mm in size but not less than 6.3 mm (see 2.59).

2.55 Plasticity — It is the spreadability of lime putty/mortar imparted by its capacity to retain water.

2.56 Popping and Pitting — A type of unsoundness caused by particles of unhydrated or incompletely hydrated lime which expand at some period subsequent to actual use. It manifests itself in the form of craters or blisters on plaster surfaces.

2.57 Preheating Zone — The top portion of the kiln where the incoming charge is preheated by the gases issuing from the calcination zone.

2.58 Quicklime — A calcined material, the major part of which is calcium oxide capable of slaking with water. This is also known as 'un-slaked lime'. Depending on the stone from which it has been derived, it may also be called high calcium, magnesian or dolomitic quicklime.

2.59 Quicklime Sizes — Quicklime may be obtained in different sizes depending upon the type of limestone, kind of kiln used or treatments subsequent to calcining. The sizes commonly recognized are as follows:

- a) *Lump* — not less than 63 mm,
- b) *Pebble or Crushed* — less than 63 mm,

c) *Ground, Screened or Granular* — less than 6.3 mm, and

d) *Powdered* — Substantially all passing 850 micron IS Sieve.

2.60 RCC Kiln — A kiln having its outer shell constructed of reinforced cement concrete.

2.61 Run-of-Kiln Quicklime — Quicklime as drawn or discharged from a kiln.

2.62 Running — The pouring of the milk of lime through sieves into a maturing vessel.

2.63 Sand-Lime Bricks — Bricks manufactured from a uniform mixture of siliceous sand or crushed siliceous rock and lime combined by the action of saturated steam under pressure.

2.64 Scaffolding — The formation of solid masses of overburnt limestone inside the kiln which, sticking to one another and to the lining of the kiln, tend to grow into an arch and thereby channelizing passage of air through the calcination zone.

2.65 Semi-hydraulic Lime — Lime containing small quantities of silica and alumina (with or without iron oxide) which are in chemical combination with some of the calcium oxide content and therefore shows the property of setting and hardening under water. This is intermediate in composition between eminently hydraulic and fat limes.

2.66 Soft Burnt Lime — Chemically reactive quicklime obtained at relatively lower temperature of calcination. It is characterized by high porosity and chemical reactivity.

2.67 Shell — The outer wall which forms the structural enclosure for the kiln.

2.68 Shell Lime — Lime obtained by the calcination of calcareous shells of organic origin.

2.69 Slaked Lime — Lime obtained by slaking of quicklime (see 2.70).

2.70 Slaking — Slaking usually means addition of the requisite amount of water to quicklime so as to form dry slaked lime, putty or slurry.

2.71 Soundness — The freedom of lime putty or hydrated powder from unslaked or partly slaked particles of lime to the extent that the expansion in a prescribed test does not exceed the specified limits.

2.72 Steel-Shell Kiln — A kiln having its outer shell made of steel plate.

2.73 Under-Burnt Lime — The quicklime which has not been calcined sufficiently and hence contains unaltered carbonates.

2.74 Unslaked Lime — See 2.58.

2.75 Vertical Kiln — A kiln with a vertical shaft having a steel or masonry or reinforced cement concrete shell (see 2.49, 2.60 and 2.72) on the outer side and brick lining in the interior.

2.76 Volume Yield of Quicklime — The volume of putty of standard consistency obtained

per unit mass of quicklime.

2.77 Water Retentivity — The ability of mortars to retain water against suction and evaporation, in general. It is indirectly a measure of the workability of mortars. It is measured by the flow of mortar when tested on a standard flow table before and after application of a specified suction.

2.78 White Wash — The combination of hydrated lime (or slaked quicklime), water and other materials to be used as a paint like coating.

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