

The Complete Book on Construction Materials

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Construction industry is the largest consumer of material resources, of both the natural ones (like stone, sand, clay, lime) and the processed and synthetic ones. Each material which is used in the construction, in one form or the other is known as construction material (engineering material). No material, existing in the universe is useless; every material has its own field of application. Stone, bricks, timber, steel, lime, cement, metals etc. are some commonly used materials by civil engineers. Selection of building material, to be used in a particular construction, is done on the basis of strength, durability, appearance and permeability. The stone which is used in the construction works, in one form or another is always obtained from the rocks. The rocks may be classified in four ways; geological classification, physical classification, chemical classification and classification based on hardness of the stone. Various king of rocks come under these classification for example; igneous rocks, plutonic rocks, sedimentary rocks, silicious rocks, stratified rocks etc. brick is the most commonly used building material which is light, easily available, uniform in shape and size and relatively cheaper except in hilly areas. Bricks are easily moulded from plastic clays, also known as brick clays or brick earth. Bricks can be moulded by any of the three methods; soft mud process, stiff mud process and semi dry process. There are various kinds of bricks; specially shaped bricks, burnt clay bricks, heavy duty bricks, sand lime bricks, sewer bricks, refractory bricks, acid resistant bricks etc. lime is an important building material, it has been used since ancient times. Lime is used as a binding material in mortar and concretes, for plastering, for manufacturing glass, for preparing lime sand bricks, soil stabilization etc. Concrete is a construction material obtained by mixing a binder (such as cement, lime, mud etc.), aggregate (sand and gravel or shingle or crushed aggregate), and water in certain proportions. Based on the binding materials, the common concretes can be classified as; mud concrete, lime concrete, cement concrete and polymer concrete. World demand for cement and concrete additives is projected to increase 8.3 percent annually in next few years.

This book basically deals with rock and stone, formation of rocks, classification of rocks, geological classification, metamorphism physical classification of rocks, chemical classification, classification based upon hardness of the stone composition of stone (rock forming minerals), igneous rock forming minerals, sedimentary rock forming minerals, texture of the rocks, types of fractures of rock, uses of stone, natural bed of stone, aluminium and magnesium alloys, mechanical properties of a partially cured resin, DMA characterization, chemical advancement of a partially cured resin, differential scanning calorimeter characterization, chemical mechanical relations, moisture content as a variable, wetability and water repellency of wood, fungal and termite resistance of wood etc.

The book provide wide coverage of building materials such as stone, bricks, lime, mortars,

concrete, asbestos, gray iron, cast iron, steel castings, aluminium, wood, architectural paints and so many others with their applications in building construction. The book is resourceful for all professionals related to construction field, technocrats, students and libraries.

1. STONE

Introduction
Rock and Stone
Formation of Rocks
Classification of Rocks
Geological classification
Metamorphism
Physical classification of rocks
Chemical classification
Classification based upon hardness of the stone
Composition of Stone (Rock-forming Minerals)
Igneous rock forming minerals
Sedimentary Rock Forming Minerals
Texture of the Rocks
Types of Fractures of Rock
Uses of Stone
Natural bed of Stone
Seasoning of Stones
Characteristics or Qualities of Stones
Characteristics of principle Building Stones
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Decay or Deterioration of Stones
Preservation of Stone
Artifical Stone
Important point to be Considered before Starting Quarrying
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Various Operations of Blasting
Precautions in Blasting
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Storing of explosives
Handling of misfires
Dressing of Stone
Machines Required for Quarrying Stone

2. BRICKS AND OTHER CLAY PRODUCTS

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Brick Earth and its Constituents
Sources of Brick Earth
Qualities of Brick Earth
Chemical composition of Brick Earth
Functions of the constituents of Brick Earth
Harmful Ingredients
Pebbles of Stones and Gravel
Alkaline-Salts
Limestone and Kankar
Vegetation and Organic Matter
Manufacture of Clay Bricks

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Test for Water Absorption
Test for efflorescence
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Specially shaped Bricks
Burnt Clay Facing Bricks
Heavy Duty Bricks
Perforated building bricks
Sand lime Bricks
Sewer Bricks
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Refractory Bricks
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Process for Manufacturing Roofing Tiles
Process for Manufacturing Flooring and Wall Tiles
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Glazed Earthenware Tiles
Terracotta
Stoneware

3. LIME

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Uses of Lime
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Some Important Terms and their Definitions
Varieties of lime
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Classification of Lime According to I.S. 712-1984
Indian Standard Specification for Lime
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Description of Each Stage of Operation
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Advantages of continuous kiln
Manufacture of Natural Hydraulic Lime
Manufacture of Artificial Hydraulic Lime
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Objective of Slaking
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Determining the Slaking Nature of Lime
Slaking Procedure for Quick Slaking Lime
Initial Preparation
Methods of Slaking Lime
General Precautions in Slaking
Slaking Procedure for Medium and Slow-slaking Limes
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Maturing
Making Coarse Stuff and Putty from Hydrated Lime or Powder
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Putty
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Classification of binding materials
Precautions to be taken in handling lime
Properties of Lime

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Classification Based on Fineness
Bulking of Sand
Desirable Properties of Sand
Function of Sand in Mortars
Fineness Modulus of Sand
Tests for Sand
Selection of Sand for Use
Substitutes for Sand
Types of Mortars
Special Mortars
Properties of Good Mortar
Test for Mortars
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Proportioning of Fine Aggregate to Coarse Aggregate
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Nickel

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Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.

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