



## METADATA

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### Abstract

In this textbook the Greek cement industry and, by extension, the concrete production industry are analyzed. The required mineral raw materials for cement production are given, their production methods are described and the mechanical preparation of the raw materials for their conversion into a suitable feed (raw meal) for the clinker production is examined. They also described the necessary preparatory processes (pre-homogenization - storage of raw materials) for producing suitable cement kiln feed. The rotary kilns and the pyro-processing operations performed in the kiln for clinker production are described. Furthermore, the book provides information on the selection of suitable refractory linings for rotary kilns. The Bogue equations used to describe the properties of clinker using the percentage ratio of its phases are then given. Afterwards, the mathematical methods for the determination of the appropriate raw materials proportioning for the production of cement are presented. Also, the size reduction processes in the

cement industry are investigated and the equations for the prediction of the energy consumed in grinding are given. The types of cement (common and composite), their uses, the methodology for the production of composite cement and the environmental impact of their production are then analyzed. Reference is also made to the energy requirements for cement production and the heat production in the kiln, as well as to the conventional and alternative fuels in the process. Subsequently, the hydration process, i.e. the chemical behaviour of cement during the production and use of concrete, is discussed, and also the chemical admixtures used in the production and use of concrete are briefly discussed. Then, the production methods of concrete aggregates are examined and the methods of testing the suitability of concrete aggregates and the Greek and international Aggregate Testing Standards are briefly reviewed. Finally, an attempt is made to investigate the environmental aspects of the production and use of cement and concrete.

