Influence of raw materials and production process on the properties of Autoclaved Aerated Concrete (AAC)

R.B Jacóe¹, L.C.R.Drummond², C.S.Rodrigues²
¹Departamento de Engenharia de Materiais, CEFET-MG, MG, Brazil
²Departamento de Engenharia Civil, CEFET-MG, MG, Brazil

Autoclaved Aerated Concrete (AAC) is a building material produced and applied worldwide mainly due to its lightweight and insulation properties. The components are composed by slurry mix of calcium (provided by lime, gypsum and ordinary Portland cement), silica (grained quartz) and water. The cellular structure results from air incorporation agents, such as aluminum powder. Due to its high porous content, AAC production requires special currying process for strength development compatible to civil engineering applications. In autoclave curing, AAC components are subject to 190°C and water vapor pressure of 1MPa during 8 to 12 hours. Under this special condition, the combination between calcium and silica results in hydration products with a crystal structure (tobermorita-like) which are responsible to strength improvements. Concerning environmental aspects of AAC, the main advantage of AAC in building construction is the energy savings with thermal conditioning of the built environments. So, AAC components are suitable for masonry wall construction, as well as for floor and roofing systems. On the other hand, the curing process is the main responsible for the high embodied energy of the material, leading to a high initial energy demand and cost [1, 2]. In spite of the challenging aspects of AAC, such as its special chemical structure, the development of AAC products mainly occurs within the industrial sector, without much data reported in the scientific literature. In this context, the study of AAC by the Research Group on Sustainable Building Materials at CEFET-MG is focused on the raw materials and the production process of AAC aiming to find out ways to reduce the autoclaving time during the curing process. In this paper there are presented the raw materials characterization, the laboratory scale production process of AAC and effects composition and production on density and compression strength of AAC products.

Keywords: Autoclaved aerated concrete, autoclave curing, insulation materials.

Study supported by Fapemig and CNPq.


E-mail: renatabj@gmail.com