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Autoclaved Aerated Concrete

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AUTOCLAVED AERATED CONCRETE

THE NEED

High energy costs, increasingly expensive construction labor and equipment, and a higher environmental consciousness of home owners, has forced home builders to search for new construction materials. New materials have to be versatile, easy to use, durable, and energy efficient.

FIGURE 1 AUTOCLAVED AERATED CONCRETE

THE TECHNOLOGY

Autoclaved aerated concrete (AAC) was developed in Europe in 1923. Commercial production of the material began in 1930. In 1995, more than 31 million cubic meters were produced by over 50 factories worldwide. And only in the past 5 years it has been introduced to the U.S. market by two important European construction companies (HEBEL and YTONG). AAC is used in a wide range of building construction with residential, commercial and industrial buildings being common applications. The system consists of small masonry-like units, larger "jumbo" units, panels, and a variety of specially manufactured shapes and pre-assembled wall sections. The walls, floors and roof of a building can be constructed with the system. Using one material to build the entire structural and insulation part of a building offers many advantages, allowing excellent design flexibility, quick construction and reduced waste.

THE BENEFITS

AAC is well known as an environmentally friendly construction material. Compared to the energy consumed in production of many other basic building materials, only a fraction is required to produce AAC. Raw material consumption is very low for the amount of finished product produced. In the manufacturing process, no pollutants or toxic by-products are produced. AAC is also completely recyclable.

Due to AAC's excellent insulation qualities, energy consumption for the heating and cooling of buildings is greatly reduced compared to most conventional wall and roof systems. In the finished structure, no pollutants or toxic substances are released that could affect indoor air quality, even in the event of fire.

Large, precisely dimensioned elements of AAC allow rapid construction. Their greater dimensional accuracy requires less on-site adjustment. The combination of large size and dimensional accuracy allows greatly increased productivity. Due to the light weight of AAC, reduced equipment demands are realized.

AAC is an inorganic material that contains no toxic substances. It does not slowly decompose and off-gas. Since AAC is both a structural and insulation material, it allows the elimination of other materials that can contribute to poor indoor air quality.

AAC buildings are very energy efficient. This efficiency is due to a combination of high R-value, thermal mass and air-tightness. AAC is the only product currently available that meets Germany's stringent energy codes without added insulation. It is well documented that the R-value of a mass product need not be as high as that of light frame construction, to perform thermally efficient. A recent study in the U.S. shows that an 8" (20cm) AAC wall performs much better than a conventional wood stud wall system with R-30 insulation.

AAC is an inorganic, insect resistant, solid wall construction material.

The solid wall construction of a building made of AAC provides excellent sound abatement, greatly reducing outside environmental noise, providing a quieter, more comfortable interior for the occupants.

AAC has proven to be a very durable material. There are numerous structures worldwide, many over 50 years old, in excellent condition. AAC will not rot, warp, rust, corrode, or otherwise decompose. AAC provides a very low maintenance building, saving considerable time and money in upkeep over the life of the building.

BARRIERS

Autoclaved Aerated Concrete has to be covered with specially design materials (plaster) in order to prevent its erosion by water. It has only been introduced by two foreign companies. Two different factories have been established in the US. One in south Georgia (HEBEL) and the other in Florida (YTONG). They only cover southeast construction market.

POINTS OF CONTACT

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REFERENCES

1. Hebel industries product catalog.
2. Ytong web site.

REVIEWERS

Peer reviewed as an emerging construction technology

DISCLAIMER

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PUBLISHER

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