IndustrialPioneersFarayand Co.

Autoclaved Aerated Concrete Technology Plants and Systems

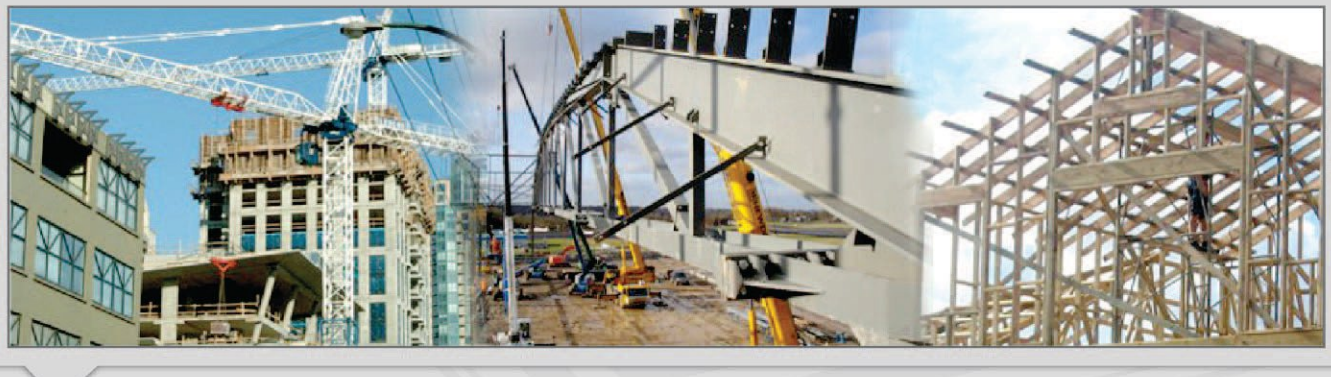
Autoclaved Aerated Concrete

• The Autoclaved aerated concrete (AAC) material was developed in 1920 in Sweden, the first patent for production of AAC was granted in 1923 to a Swedish architect Johann Erikkson over the years, as the merit of the product were realized by other the producers began providing licensing and know-how to other European countries.

• AAC is a lightweight building material with unique cellular structure that provides superior energy efficiency, fire resistance and acoustical properties. Also the cost at construction site is reduced by using AAC material due to easy installation.

• The basic materials used in AAC productions are portland cement, lime, water, sand or fly ash, and aluminum.

The sand is ground to a powder-like consistency and mixed with the remaining materials to form slurry, the slurry is then poured into molds. Entrained air bubbles are created by a chemical reaction between the hydration product and aluminum powder which causes the material to rise in the mold. After curing, the product is cut into uniform sizes. Finally, the products are steam-cured under high pressure in autoclaves.



AAC Advantages and Benefits

- **Environment protection**: The first Advantage of Autoclaved aerated concrete is designed for consumers who are environmentally conscious. It helps to reduce at least %30 of environmental waste, decrease over %50 of greenhouse gas emissions.
- **Energy saving**: The remarkably good insulation properties of Autoclaved aerated concrete mean a pleasant interior environment is achieved. In most cases the need for supplementary insulation can be avoided. This results in cost savings for heating and cooling.
- **Lightweight**: Autoclaved aerated concrete blocks weigh approximately %50 less than other comparable building products.
- **Great Acoustics**: Autoclaved aerated concrete has excellent acoustic performance due to their porous structure.
- **Fire resistant**: Like other type of concretes, this material is completely inorganic and not combustible.
- **Great Ventilation**: As a result of airy nature of autoclaved aerated concrete, these materials are capable in absorbing and releasing moisture.
- **High dimensional accuracy**: The accurate manufacturing process of Autoclaved aerated concrete blocks, results in easy installation and reduction in quantities of mortar and finishing materials
- **Long life**: Autoclaved aerated concrete products are not affected by harsh climatic conditions and will not degrade under normal atmospheric conditions.

Description of Process

Material Preparation

The sand slurry is prepared in a wet ball mill and then conveyed into the slurry tank by a pump. The slurry density is controlled by continuous measurement.

The Slurry silo is equipped with a mixer, which will prevent any solids setting in the base of tank by keeping the slurry continuously in motion.

Lime and cement arriving from their respective silos are conveyed onto the mixer tank where also the slurry, aluminum and water will be added, the tank will continuously weighted in order to guarantee the right quantity of the mixture before it be filled into the moulds.

Mould Pouring

The inner mould surfaces are covered with demoulding release oil before casting. This oil is applied either manually or automatically.

The mixture is filled into mobile moulds. By a controlled temperature, the mixture expands, start to stiffen, and inside the cake form small hydrogen bubbles which give the typical characteristic micro-porosity of the AAC.

After about 3 hours of stiffening, the AAC bulk has become a cake, stiff enough and stabile to be removed from the mould and cut in single elements with great precision.

Depending on the plant design, the moulds are handled by a mould transfer car or by the tilting –manipulator.

Cake Cutting

The cakes are cut in blocks, plates or panels which are conveyed into high pressure and temperature cylindrical shell (Autoclaves) for the final strength and harding. Vertical cutters, horizontal cutters and cross cutters are used for cutting AAC blocks, based on plant design.

Cake Hardening

The cakes are cured in the autoclaves for about 12 hours at 12 atmospheres' saturated steam pressure and at temperature of approximately 200°c.

The steam pressure chambers work fully automatically and are highly energy efficient due to an optimized process in control .technology the curing process flows enact defined procedural steps .the curing time depend on the density and grade of open.

Product Packaging

At the end of the production process, the cured cakes are packed and stocked according to market requirements. Usually blocks will be delivered as packs on wooden pallets strapped or covered in foil.

I.P.F Services for AAC Plants:

- Plant Design, Construction & Commissioning
- Equipment Design
- Equipment Manufacturing & Installation
- Civil & Architectural Engineering
- Electrical Engineering
- Supervision

Industrial Pioneers Farayand Co.

Address: Unit 7, No. 10, 1st Kowsar St, Tohid sq, Tehran, Iran

Phone: +9821 66922542 Fax: +9821 66423489

www.ipfarayand.com info@ipfarayand.com