

FACTORS AFFECTING ON USE OF AAC BLOCKS IN CENTRAL GUJARAT REGION

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Abstract—Autoclaved aerated concrete (AAC) is a construction material that is factory-made and available to the user in blocks and precast units for walls, floors, and roofs. Blocks for laying in mortar or glue are produced without any reinforcement. It has gained widespread use in many areas of the world including Europe, South America, the Middle East, and the Far East. In brief, autoclaved Aerated concrete is a porous lightweight concrete whose cellular Structure is generally obtained through an in situ gas-producing Chemical reaction of a sand and cement slurry. It generally contains no coarse material. Subsequent autoclaving of the material at high temperature and pressure imparts strength, dimensional stability, and other properties of the hardened final product. The autoclaved aerated concrete building material is obtained as the result of a reaction between the binder containing calcium oxide and a silica component cured in an autoclave, and a cellular structure producing ingredient. Autoclaved aerated concrete is at times, referred to as "aerated concrete," "gasbeton "and" autoclaved lightweight concrete (ALC)."

Index Terms— AAC BLOCK, ALC, STABILITY, POROUS, LIGHT WEIGHT.

I. INTRODUCTION

Autoclaved aerated concrete is a type of cellular concrete. Another type, using preformed foam and cast in place, is commonly used in the United States for floor and roof fills. The important properties of autoclaved aerated concrete are present to a large degree in cellular concretes which have not been autoclaved. An often reported advantage of autoclaved aerated concrete is the combination of relatively low thermal conductivity, and load bearing capacity for use in structural applications. Other advantages include relatively low density, high strength to weight ratio, nail ability, fire resistance, good thermal resistance, and high sound insulation value. Its low density permits use of large building units, which is a reported advantage in pre fabrication.

II. CONSTITUTE MATERIALS

A. Cement:

Cement can be defined as material having adhesive and cohesive properties which make it capable of bonding material fragments into a compact mass. Cement is the most important ingredient in concrete. Different brands of cement have been found to possess different strength development characteristics and rheological behaviour due to the variations in the compound composition and fineness. For the present investigation, ordinary Portland cement (chettinad) of 53 grade conforming to IS 12269-1987 was used.

B. Fly Ash or Sand:

Key ingredient for manufacturing AAC blocks is silica rich material like fly ash or sand. Most of the AAC companies in India use fly ash to manufacture AAC blocks. Fly ash is mixed with water to form fly ash slurry. Slurry thus formed is mixed with other ingredients like lime powder, cement, gypsum and Aluminium powder in quantities consistent with the recipe. Alternately sand can also be used to manufacture AAC blocks. A 'wet' ball mill finely grinds sand with water converting it into sand slurry. Sand slurry is mixed with other ingredients just like fly ash slurry.

C. Lime Powder:

Lime powder required for AAC production is obtained either by crushing limestone to fine powder at AAC factory or by directly purchasing it in powder form. Although purchasing lime powder might be little costly, many manufacturers opt for it rather than investing in lime crushing equipment like ball mill, jaw crusher, bucket elevators, etc. Lime powder is stored in silos fabricated from mild steel (MS) or built using brick and mortar depending of individual preferences.

D. Gypsum:

Gypsum is easily available in the market and is used in powder form. It is stored in silos.

E. Aluminium Powder/Paste:

Aluminium powder/paste is easily available from various manufacturers. As very small quantity of Aluminium powder/paste is required to be added to the mixture, it is usually weighed manually and added to the mixing unit.

F. Cement:

53-grade Ordinary Portland Cement (OPC) from reputed manufacturer is required for manufacturing AAC blocks. Cement supplied by 'mini plants' is not recommended due to drastic variations in quality over different batches. Some AAC factories might plan their captive cement processing units as such an unit can produce cement as well as process

lime. Such factories can opt for 'major plant' clinker and manufacture their own cement for AAC production. Cement is usually stored in silos.

G. **Mixing Water:**

Water conforming to Standards should be used in SCC mixes. Where recycled water, recovered from processes in the concrete industry, is used but should conform the specifications.

OBJECTIVES

- 1) To describe the process used in the manufacture of autoclaved aerated concrete,
- 2) To present an overview on the use and properties of Autoclaved aerated concrete products, and
- 3) To provide a listing of standards and related documents

I. PREVIOUS RESEARCH REVIEW ON USE OF WASTE MARBLE DUST AND FLY ASH IN CONCRETE

- 1) Shweta o. rathi, p.v. khandve, Ram meghe college of engineering and management, Badnera, Amravati m.s. Shweta o. rathi (2015) found that the compressive strength of AAC block are comparatively more than traditional clay brick. Which are suitable for walls and RRC framed building. In which she found that density of AAC blocks as 1/3 that of traditional clay brick. there is no change in wet condition. And the workability of AAC help to eliminate waste on the site.
- 2) Ahsan habib(2015) suggested that to meet the housing shortage of thee country necessary steps should be taken to introduced new and better alternative building material
- 3) Jan kosny studied the difference between AAC concrete producer and a research laboratory on the thermal performance and evaluation of AAC during his research detail energy performance data for AAC concrete created and correlation developed can be use in designing energy efficient building.
- 4) Jayeshpitroda(2015)researched that about the respondent have build an AAC manufacture that before 2000 and there are maximum opinion is 40%. Most of manufacturing plant of AAC block are located near Surat.
- 5) Ali j. ahmed (December 2014) researched on that the compressive strength of foamed concrete can be developed reach to structural strength compared to auto clawed concrete. Aerated light weighted concrete is considered as economic materials and consumptions of byproducts and waste material such as flyash.
- 6) Prakash TM(2013) focuses on the strength and plastic properties of AC block masonry.AC block unit possess lot many advantages over conventional large weight masonry.AC block has the least density when compared to any other type of masonry unit. The water absorption is extremely high of AC block. AC block has least compress strength when compared to any other type of masonry unit.
- 7) Jikuimiao(2015) researched on self-thermal insulation wall construction technology of AACB. The reinforced concrete shear wall in self thermal insulating system of AAC block can avoid the internal surface dew condensation on walls by passing thermal-insulating places and plastering thermal-insulating mortar materials.
- 8) Mr. Ashish s. moon and Dr. Vaissonvarshese(2015) studied about how foam concrete can be used for sustainable construction as a building material, their studies shows that better mechanical and physical properties of concrete can be obtained with the replacement of send with quarry dust in mx3 mix. Thus they found that foam concrete is a sustainable building construction material as send can be replaced with quarry dust up to 100%.

II. CONCLUSION

To meet the housing shortage of the country necessary steps should be taken to introduce new and better alternative building materials through adaptation of the knowledge of developed countries. Due to its advantageous properties, to develop entrepreneurship for industrial production of aerated concrete block in our country as it is an environment friendly and energy efficient material which is the need of the day.

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