

Background to the Note

AAC Blocks manufacturing is gaining prominence in the Indian market and a large number of plants are being set up across the country. We at Sparrow Business Solutions LLP have researched the space and present our findings in this note. We have taken some of the data from the marketing material of AAC Block manufacturers in India. This is to give CLIENT an idea (in however far incase unknown to you with regard to India) as to how the concept is currently being marketed by the manufacturers and consultants in the segments. The information on the competitors, equipment suppliers and potential deals is based on our primary research.

Introduction

The face of realty market in India has changed rapidly over the past few years. Large number of Integrated Townships, Mass Housings (for Urban Poor, Slum Rehabilitation etc.), IT/ITES parks, High rise buildings and SEZs' are commonly seen these days and the growth in the segment will only increase exponentially in the years to come.

Majority of such projects are still being constructed using the conventional methods, construction in-situ. Thus the inherent advantage of repetitions and huge volume turnover remain unexploited. In addition, these large scale projects constructed using conventional methods complicate the project management in terms of speed, consistency and quality of the construction.

Shortage of urban labor and high interest costs have forced developers and construction companies to look for faster and more efficient building materials.

Why AAC has been gaining prominence in India?

The key commercial reason for the growing popularity of the AAC technology is the low capital investment and quick pay-back period. This key reason has prompted over fifteen companies setting up single location AAC block manufacturing factories in India in the last three years.

Low capital investment makes it suitable for smaller and medium sized builders and developers to get into this business.

The larger serious manufacturers with multiple locations have chosen this over Precast concrete or Prefabricated structures due to the following other reasons:

1. Eco-friendly

- Makes productive use of recycled industrial waste (fly ash).
- Non-polluting manufacturing process – the only by-product is steam.
- Made of non-toxic ingredients.
- Does not exude gases.
- Total energy consumption for producing AAC is less than ½ of what it takes to produce other building material.

2. Lightweight

- 3-4 times lighter than traditional bricks, therefore, easier and cheaper to transport; AAC block weigh approximately 50% less than a standard CMU block and approximately 30% of standard cast-in-place concrete.
 - Usage reduces overall dead load of a building, thereby allowing construction of taller buildings.
- 3. Thermally Insulated & Energy Efficient**
 - Tiny air pores and thermal mass of blocks provide excellent thermal insulation, thus reducing heating and air conditioning costs of a building.
 - 4. Fire Resistant**
 - Non-combustible and fire resistant up to 1600° C and can withstand up to 6 hours of direct exposure.
 - 5. Acoustic Performance**
 - Superior sound absorption qualities due to porous structure of blocks.
 - Offers sound attenuation of about 42 dB, blocking out all major sounds and disturbances.
 - Ideal for schools, hospitals, hotels, offices, multi-family housing and other structures that require acoustic insulation.
 - 6. Easy Workability and Design Flexibility**
 - Blocks can be easily cut, drilled, nailed, milled and grooved to fit individual requirements.
 - Available in custom sizes.
 - Simplifies hydro-sanitary and electrical installations, such as pipes or ducts, which can be installed after the main construction is complete.
 - 7. Sustainable**
 - Retains properties over time.
 - Made of non-allergenic material.
 - Use of AAC improves indoor air quality.
 - 8. Earthquake Resistant**
 - Lightweight blocks reduce mass of a structure, thus decreasing the impact of an earthquake on a building.
 - Non-combustible nature provides an advantage against fires, which commonly accompany earthquakes.
 - 9. Precision**
 - Available in exact sizes.
 - Results in smooth walls with perfect contact between different elements.
 - Reduces cement and steel usage.
 - 10. Termite/Pest Resistant**
 - Due to structure of blocks, AAC blocks cannot be damaged or infested by termites and other pests.
 - 11. Cost Effective**

- Reduces operating cost by 30% to 40%.
- High-insulation blocks save up to 30% in energy costs.
- Variety in sizes of blocks helps increase carpet area.
- Wall painting and plastering last longer as almost nil efflorescence affects AAC. This translates into lower maintenance costs.

12. **Faster Construction**

- Reduces construction time by 20% or more.
- Different sizes of blocks help reduce the number of joints in wall masonry.
- Lighter blocks make construction easier and faster.
- Easy to install. Sets and hardens quickly.

13. **Carbon Credits**

- AAC Block manufacturing is eligible for Carbon credits and it is safe to consider carbon credits revenue to be around 2 Euros/m³.

14. **Financially Attractive Investment**

- Average Profit after taxation is 20% currently.
- Payback period of capital investment is less than 30 months currently.

Select on the ground feedbacks

- 1) 24 out of the 26 AAC concrete blocks manufacturing plants set up are with **foreign equipment suppliers**. The key equipment suppliers in the Indian market include
 - a) Hess Group <http://www.hessgroup.com/en/hess-group/locations/>
 - b) Jiangsu Teeyer Engineer Machinery CO.,LTD <http://www.teeyer.com/enindex.asp>
 - c) Masa Group <http://www.masa-group.com/en/group/masa-india.html>
- 2) The **duty structure** for the manufacture and sales of AAC Blocks is :
 - a) Excise duty payable on manufacture 12.36%
 - b) Value Added Tax payable on sales ~ 4% (varies across states)
- 3) **Raw Material**
 - a) **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. 95% of the plants in India use fly ash as the raw material. There are large number of thermal power plants across the country and fly ash produced by them is readily available. A typical 800 MW power plant produces 4,000TPD of fly ash.
 - b) **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.

- c) **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.
 - d) **Gypsum** Gypsum is easily available in the market and is used in powder form.
 - 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.
- 4) Unlike Europe where 300 Km. radius is the limit for sale of AAC Blocks, in India currently due to lack of sufficient capacity and competition, it is seen that AAC Blocks are sold even 500 km. away from the manufacturing locations. However the radial distance in states like Gujarat where AAC Blocks manufacturing plants are located within 200 Km of each other, is much less.
- 5) The capital cost for a 160,000 m³ per annum capacity plant excluding land is about Euro 1.5 Million. This is a minimum capacity plant and some of the Indian companies have a plant with this capacity. The economically feasible plant with capacity of 500,000 m³ per annum costs about Euro 2.5 Million.
- 6) Land: A plant requires an area of 21,000 square meters for smooth operations based on a planned capacity of 160,000 m³.
- 7) Each plant requires 3-4 senior level trained employees and a large number of skilled and trained labourers. Such skilled labour is currently not available in India but there are a large number of Indian origin labourers in Middle East (Saudi Arabia, UAE) who are coming back to India (due to expiry of their work permits and change in regulations).

Key manufacturers of AAC Blocks in India

There are 26 manufacturers of AAC Blocks in India currently. Majority of them are located in the state of Gujarat in Western India where one finds an AAC plant within a distance of less than 100 Km. A significant majority of these plants are set up by using imported equipment, either European or Chinese.

A select list of AAC block manufacturer is as under:

Name of Company	# Plants	Website	Remarks
Cement Manufacturers			
Ultratech Cements	2	http://www.ultratechbuildingproducts.com/	Ultratech Cement is one of the largest cement manufacturers in India. Their brand is called XTRALITE
JK Lakshmi Cement	1	www.jklakshmi.com/	The cement manufacturing capacity for the company is 5.3 Million Tons per annum
Building material companies			
Biltech Building Elements Limited	5	http://www.biltechindia.com/	An Avantha Group Company is engaged in mechanized manufacture of AAC building material in India. Currently Biltech has over 40% of the market share with a capacity of 470,000m ³ per annum
Magicrete	2	http://magicrete.in/	Incorporated in 2008, is the second largest manufacturer of AAC blocks and recently forayed into offering gypsum plaster and dry mortar. Company also recently raised USD 7 Million from an Indian Private Equity fund.
Others (Unrelated diversification)			
Ecolite by JVS Comatsco Industries Pvt Ltd	1	http://www.ecolite.in/	Their flagship Company is Sahyadri Industries Ltd. which manufactures the Swastik brand Fibre Cement Sheets.
Siporex	2	http://www.lccsiporex.com/	Use sand as the key ingredient
Laxmi En-fab	1	http://www.aacplant.co.in/index.html	Located in the state of Gujarat

Future potential triggers

1. Rationalization of the excise and sales tax structure to bring down the cost of sales.
2. Change in the building construction norms which mandates use of Pre-cast technology in certain types of construction.
3. Higher awareness and appreciation of the advantages of the Pre-cast technology over the conventional method.

Options for CLIENT

CLIENT will need to have a manufacturing presence in India to be cost competitive. The two options CLIENT can consider for setting up a manufacturing presence in India include

Option 1 Greenfield manufacturing plant

The key factors to consider when setting up the plant would include

- **Location and availability of land / industrial parks**
Land must be correctly zoned for manufacturing. Often purchase of land in zones designated residential or commercial is of no use and re-zoning is very complicated. Land can often not be purchased freehold but leased for long periods (30 years to 99 years). Purchasing land can be complicated as title searches are not always comprehensive and future claims troublesome. Industrial parks can be the easier way forward, but even here key terms and facilities need to be investigated.
- **Cost of land**
Land prices have been increasing in all countries in ASEAN and in India. Increasing populations and scarcity of land make this an emotive issue. We often advise companies to avoid sensitive areas and select more readily available non contentious land even if the price is higher. Negotiations on pricing are nevertheless expected and necessary.
- **Utilities – power, water, gas, telecommunications availability and consistency**
There are usually shortages of power or water and gas. Business plans must take into account back up electricity generation. Power costs are also usually high. Telecommunications are usually excellent, including high speed data transfer facilities.
- **Accessibility and roads / Proximity and connectivity to ports / Ease of logistics and transport / Connectivity to rail network**
Logistics and transport infrastructure is key and issues here can severely impact the work flow. Proximity to efficient and internationally connected ports is perhaps the most crucial aspect to look into.

- The location of the plant(s); Proximity to a major city / Location
This is important for human resources reasons (ability to attract both local talent and expats) as well as for access to decision makers and customers in the selected country.
- **Operations**
 - Raw material availability and proximity will depend on distance to power plants (for fly ash) or river or sea (for sand).
 - Component and supplier availability and proximity
 - Other competitors in the area
- **Labour**
 - Shop floor and middle management
 - Cost
 - Skills
 - Unions / protests and labour relations
- **Senior Management and Expats**
 - Location is liveable and attractive to senior management and expats
 - Location is liveable for ex pat families
- **Whether single or multiple locations; Size and capacities. Two strategies to compare are:**
 - Big Leap. Set up a major manufacturing facility
 - Small Step. Set up a small assembly operation or even consider outsourced contract manufacturing

Often much depends on human resource constraints and not just capital requirements.

Sparrow Advisory is well experienced in offering a full set of advisory services across the entire chain of processes from strategy formulation to actual greenfield manufacturing plant set up.

Option 2 JV with potential customers in the market

Potential JV partners

1. **Thermal Power Plant Operators:** All the thermal power plant operators produce large quantity of fly ash. A typical 800 MW power plants produces 4,000TPD of fly ash. Further some of the below mentioned power companies are also infrastructure development companies (airports, highways, malls) and can be both raw material suppliers and end customers.
 - NTPC
 - Lanco Infratech



- GMR Infrastructure
- GVK Power
- DB Power
- Adani Power
- India Bulls Power

2. Real Estate Developers and Construction Companies

These are the potential customers and often have enough captive business to justify setting up an AAC block manufacturing unit themselves. These companies would however be happy to set up a Joint Venture with an industry expert who can run the plant and ensure they get their supplies on schedule.

Real Estate Developers

- DLF Limited
- Parsavnath Developers
- Prestige Estates
- Kumar Builders
- Sobha Developers
- Mantri Realty
- Kalpataru Realty
- Omaxe Developers

Construction Companies

- Shapoorji Pallonji
- HCC
- IVRCL
- Sadbhav Engineering
- Jaypee Infratech
- Simplex Infrastructure
- Nagarjuna Construction

Option 3 Acquisition of an existing competitor

This may not be an easy option as there are very few quality AAC blocks manufacturing companies. The industry in India is only 3-4 years old and hence M&A may not be possible option. However we can explore this option too.

Annexure 1 Comparison between Autoclaved Aerated Concrete (AAC) blocks and clay bricks

#	Parameter	AAC Blocks	Clay Bricks
1	Soil Consumption	Uses fly ash which is a thermal power plant waste product & thus no consumption of top soil	One sq ft of carpet area with clay brick walling will consume 25.5 kg of top soil
2	Fuel Consumption	One sq ft of carpet area with AAC blocks will consume 1 kg of coal	One sq ft of carpet area with clay bricks will consume 8 kg of coal
3	CO2 Emission	One sq ft of carpet area will emit 2.2 kg of CO2	One sq ft of carpet area will emit 17.6 kg of CO2
4	Labour	Organized sector with proper HR practices	Unorganized sector with rampant use of child labour
5	Production Facility	State-of-the-art factory facility	Unhealthy working conditions due to toxic gases
6	Tax Contribution	Contributes to government taxes in form of Central Excise, VAT and Octroi	Does not contribute to government exchequer
7	Size	625 mm x 240 mm x 100-300 mm	225 mm x 100 mm x 65 mm
8	Variation in Size	1.5 mm (+/-)	5 mm (+/-)
9	Compressive Strength	3.5-4 N/m ²	2.5-3 N/m ²
10	Dry Density	550-700 kg/m ³	1800 kg/ m ³
11	Fire Resistance (8" wall)	Up to 7 hours	Around 2 hours
12	Cost Benefit	Reduction in dead weight leading to savings in steel and concrete	None
13	Energy Saving	Approximately 30% for heating and cooling	None
14	Price	INR 3500-4400 per m ³ i.e. Euro 45-56	INR 2400-2500 per m ³ i.e Euro 31-32

Annexure 2 SWOT analysis of the AAC Blocks technology in Indian context

<p><u>Strengths</u> Speed, Quality, Economy Low Maintenance Seismic Resistant Fast payback of investments Universal Application</p>	<p><u>Weakness</u> Lack of awareness, acceptability & availability Resistance to Change Fear of Unknown Unfamiliarity of Architects and Engineers Lack of Exposure to the technology in Technical Institutes</p>
<p><u>Opportunities</u> Huge Requirement of Affordable Houses Shortage of Skilled Labor Large Size Projects Exposure to Global Market Demand for Quality Construction</p>	<p><u>Threats</u> Govt. Tax Policy, Lack of Govt. Support & encouragement Vested Interests Lack of Standardization</p>