Dongyue Machinery Group Co., Ltd., 276303 Linyi City, China

Synergizing large and small AAC plants: A strategic Integration

The construction industry is a vital pillar of global economic development, playing a significant role in national economies worldwide. However, influenced by political environments, economic structures, population density, and resource availability, the growth of the construction sector remains uneven. Materials for wall construction, such as Autoclaved Aerated Concrete, have evolved alongside the construction industry, leading to similarly imbalanced global development of the AAC sector.

In densely populated countries like China and Indonesia, the AAC industry has matured and is characterized by advanced construction techniques and refined production processes. However, amid economic restructuring, rising demands for low-carbon products, and intensifying market competition, the AAC sector must pivot toward smarter, greener, and more sustainable solutions.

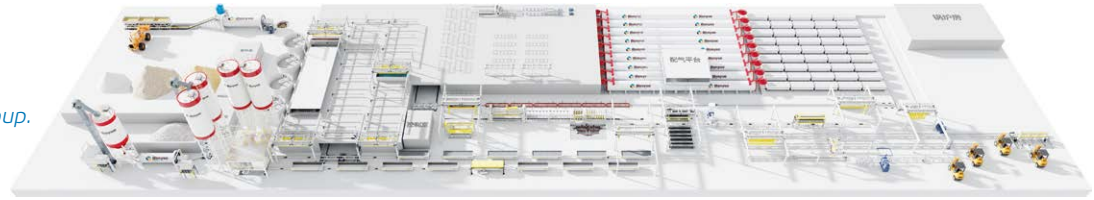
Since 2023, Dongyue has pursued technological innovation, industrial upgrades, and management reforms to unlock new growth opportunities, empowering manufacturers to enhance competitiveness and achieve sustainable development.

Design innovation: Building an intelligent, efficient, and energy-saving system

Dongyue optimizes resource allocation, boosts production efficiency, and minimizes costs through rational factory planning, process layouts and equipment configuration. Examples include increasing mould curing stations to reduce lime consumption, deploying automated feeding systems to reduce labour and improve safety, adding flexible packaging stations to accommodate diverse product specifications, and implementing waste heat recovery systems to achieve zero steam emissions.

Equipment innovation: Enabling high-speed, high-capacity, and high-efficiency production

To maximize output and reduce unit costs, equipment must operate at peak efficiency. Related innovations include dual pouring systems for simultaneous mould filling, dual clamping and packaging systems to accelerate product handling, and enhanced hydraulic and electrical systems achieving a 90-second cycle time per mould. Such an AAC production line can now achieve an annual capacity of 1 million cubic meters, which is ideal for high-demand, competitive markets.



Modern plant layout by Dongyue Machinery Group.

Management optimization: Reducing labour and enabling full digitalization

Through MES (Manufacturing Execution Systems), Dongyue integrates production data to monitor energy consumption, product output and defect rates

Dongyue Multifunctional Cutting Line for large AAC plants.

in real time. For example, sensors adjust steam supply dynamically based on autoclave pressure and temperature, cutting energy waste.

Dongyue is also pioneering single-operator factories, where one worker can initiate full production with a single command.

Production optimization: Flexibility and rapid response

To meet customized block and panel demands, Dongyue developed smart mould systems for quick product specification changes, enabling 48-hour order turnaround. Future integration with automated logistics and AI-driven warehousing will further reduce inventory and expedite deliveries.

Challenges of traditional large AAC plants

Large AAC plants (annual capacity >300,000 m³) face hurdles in sparsely populated, resource-scarce, or underdeveloped markets:

- Limited and volatile market demand: Large factories face unstable construction market demand, leading to idle capacity and surging marginal costs. This makes it challenging to sustain the break-even point for such plants.
- Supply chain bottlenecks: AAC production relies on centralized raw material supplies (e.g., silica sand, cement, lime). In remote regions, transportation costs can exceed 40% of total material expenses, exacerbating logistical challenges.
- Energy infrastructure weaknesses: Insufficient local power or natural gas infrastructure often force production cuts due to energy shortages, further straining operational efficiency.
- Market mismatch: Poor market alignment arises from the conflict between product standardization and diverse demands. Large factories that prioritize efficiency typically produce uniform specifications, whereas sparsely populated regions often require customized dimensions (e.g., non-standard blocks tailored to traditional architectural structures), resulting in excess inventory.
- Logistics costs: Long-distance transportation costs erode profits. If a factory is located far from the end market, the logistics costs for AAC products may exceed the product's own value.

Table 1: Dongyue AAC plant portfolio

Production plant type	Annual production (m³/year)	Equipment selection
Mini Plant	30,000-60,000	DY2.4x1.2x0.6m
		DY3.0x1.2x0.6m
		DY3.6x1.2x0.6m
Medium Plant	150,000-300,000	DY4.0x1.2x0.6m
		DY4.2x1.2x0.6m
		DY4.8x1.2x0.6m
Large Plant	300,000-500,000	DY5.0x1.2x0.6m
		DY5.4x1.2x0.6m
		DY6.0x1.2x0.6m
Very Large	500,000-1,000,000	DY6.0x1.5x0.6m
		DY7.2x1.2x0.6m
		DY7.5x1.2x0.6m

As a consequence of the above considerations, large plants are not universally viable, as they may be related to high investment costs and low returns.

The Mini AAC Factory solution

Dongyue targets niche markets with mini AAC plants (annual capacity: 10,000 - 60,000 m³), lowering upfront costs and shortening payback periods.

Core advantages of Mini AAC Factories

- Cost-effectiveness: Low upfront investment and flexible operations. The entry barrier is reduced by 50%: A mini AAC production line requires only RMB 7–15 million (appr. 1-2 million EUR), and

Compact AAC production workshop.

offers phased expansion options. For example, a compact plant in Nepal achieved an annual output of 30,000 m³ of AAC blocks with an initial investment of just RMB 8 million (appr. 1 million EUR).

- Energy efficiency: Mini plants feature lower installed capacity, minimizing power waste even during low-load production. Smaller autoclaves and reduced boiler specifications ensure efficient steam utilization.

- Automation: Compact yet fully functional. Even mini AAC plants can adopt fully automated operations, eliminating challenges in worker recruitment and management.

- Asset-light, on-demand production: Factories dynamically adjust capacity based on orders to avoid inventory waste. In a pilot project in Mongolia, a mini plant achieved an 85% capacity utilization rate, compared to 35% for local large plants.

- Rapid delivery & customization: Mini plants switch product specifications within 48 hours to fulfil small-batch orders. For instance, producing ultra-lightweight AAC insulation panels for a 500 m³ order still yielded profitability.

- Community-driven sales networks: Direct partnerships with local builders and contractors shorten supply chain layers. In rural India, the “One Village, One Agent” model tripled product penetration compared to traditional channels.

Mini AAC factories break traditional industrial barriers through “lightweight investment, localized production and smart responsiveness.” Their value extends beyond economical benefits, fostering inclusive global construction by delivering affordable, high-performance materials to remote regions.

Global success stories

Dongyue Machinery’s mini AAC plants have been successfully established in countries such as Nepal, Russia, India and Indonesia, receiving strong client acclaim. This further validates that mini AAC factories are a critical component in the globalization of the AAC industry.

Future vision

Amid fierce market competition, Dongyue employs a triple-strategy approach – "technological innovation + lean management + market focus" – to help clients reduce costs and enhance efficiency. Looking ahead, Dongyue aims to leverage AI technology to solidify AAC’s central role in the global green building movement.

Mini AAC plant with combined block and panel production.

Single door autoclaves.

Dongyue sponsored the free download possibility of the pdf-file of this article for all readers of AAC Worldwide. Simply scan the QR code with your smartphone to get direct access to the **Dongyue** Company Channel.

Dongyue Machinery Group CO.,LTD
AAC Block & Panel Production Line Manufacturer
Dongyue Technology Industry Zone
276303 Linyi City, China
T +86 539 8036228
www.dongyuegroup.com
www.chinablockmachine.com