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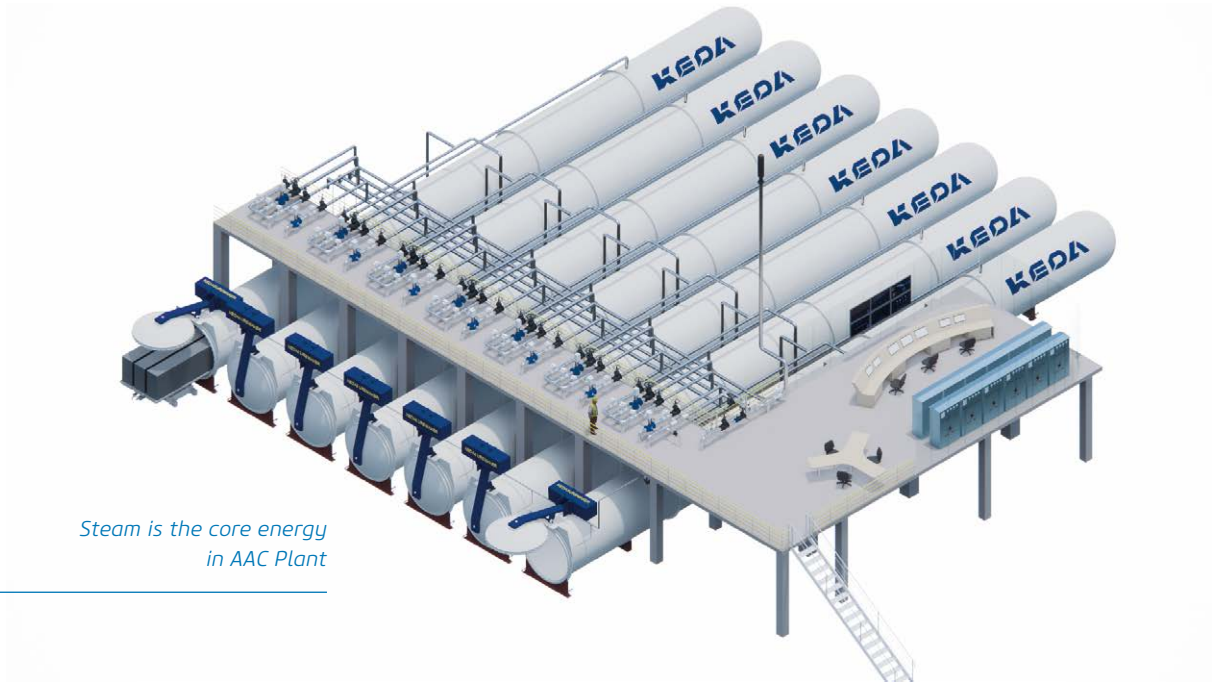
Smart Steam Solution for Green and Efficient AAC Production

Against the backdrop of global energy transition and China's dual-carbon strategy, the building materials industry is under growing pressure to improve energy efficiency and reduce emissions. Autoclaved aerated concrete, a lightweight and sustainable material, offers strong environmental performance during use. However, its manufacturing process – particularly the autoclaving stage – remains highly energy-intensive. In a typical AAC plant, steam accounts for the largest portion of total energy consumption, making it the top priority for efficiency upgrades.



Steam is the core energy in AAC Plant

Traditional steam systems in AAC production often suffer from frequent manual interventions, poor control accuracy, low recovery of waste steam, inefficient condensate drainage, and excessive emissions. These issues contribute to energy waste, unstable product quality, and reduced operational efficiency.

To address these challenges, Keda has introduced the EcoSteam AAC Energy-Saving Solution. The system is built upon three core functional pillars that work synergistically to deliver exceptional performance:

- Intelligent Steam Distribution System: Enables precise and optimized steam delivery to autoclaves.
- Advanced Automatic Drainage System: Ensures efficient condensate discharge and prevents steam leakage.
- Comprehensive Waste Heat Recovery System: Maximizes the reuse of thermal energy from waste steam and condensate.

Keda AAC EcoSteam Solution

It represents a strategic upgrade path for manufacturers pursuing both operational excellence and environmental sustainability.

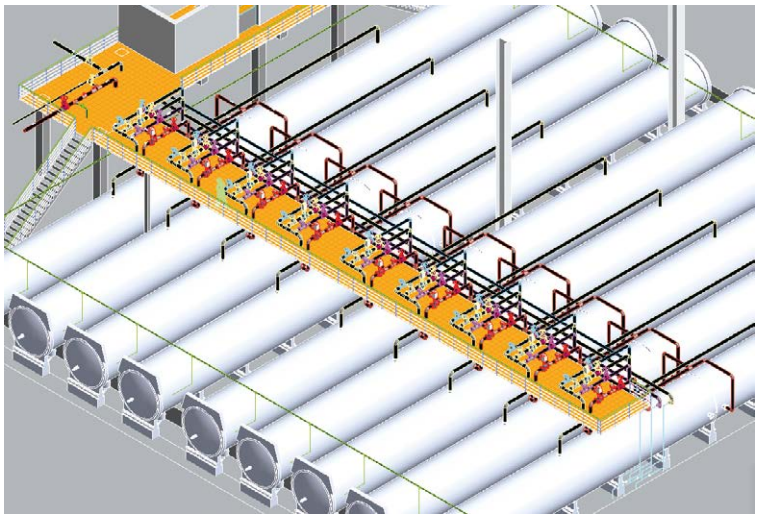
Three Core Systems Supporting EcoSteam

Intelligent Steam Distribution System

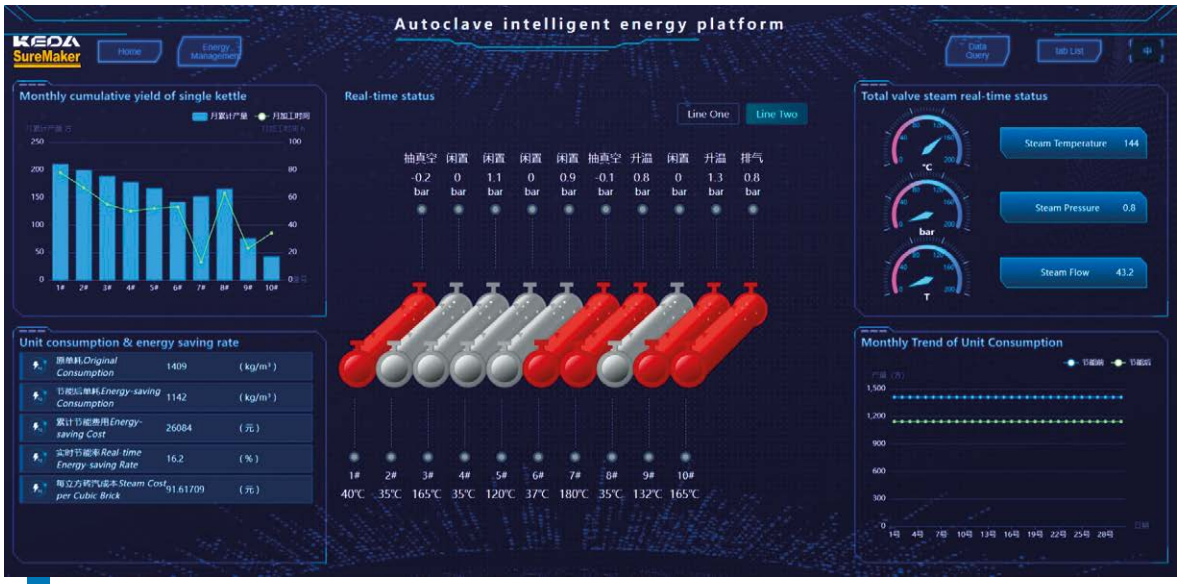
At the heart of the EcoSteam solution is the intelligent steam distribution system, which delivers precise and stable steam supply to autoclaves. Unlike traditional setups that rely heavily on manual valve operation, this system enables automated, real-time control of steam flow and pressure based on process demands.

The system employs a unique combination of regulating valves and shut-off valves. The shut-off valves ensure tight sealing, while the regulating valves provide precise control with an accuracy of up to 0.1%. This configuration not only optimizes steam regulation but also guarantees excellent sealing, leading to reduced steam consumption and lower long-term maintenance costs.

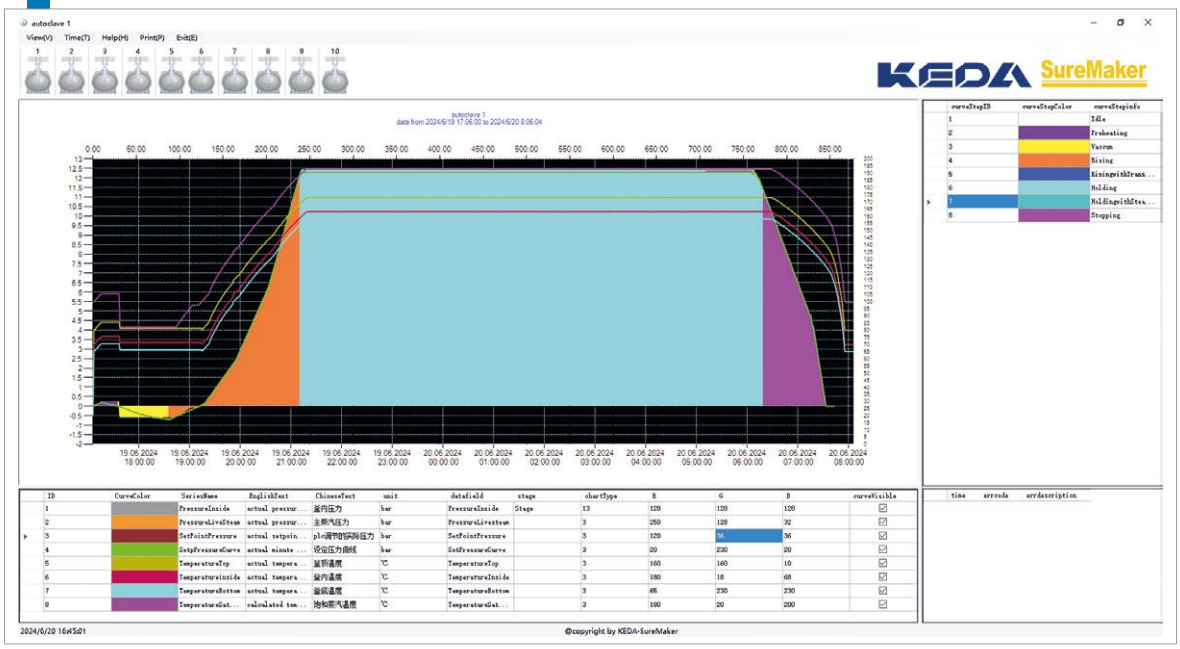
This intelligent distribution not only improves energy efficiency by avoiding over- or under-supply of steam but also ensures consistent pressure across multiple autoclaves – critical for stable curing and product quality.



Keda uses advanced 3D software for HVAC piping design to make sure the accuracy.



The integrated professional software enables full-process control of the autoclaving operation.



The system's software ensures full process automation control with intelligent multi-stage steam guidance. It also features intelligent fault detection, allowing for timely identification of equipment issues. Precise control algorithms enable immediate curve correction in the event of disturbances. A comprehensive recipe management system provides intelligent curve analysis for optimal process control.

Advanced Automatic Drainage Solution

In the AAC production process, the drainage of condensate water from the autoclave is a critical factor affecting energy efficiency, product quality, and equipment stability. Ineffective drainage can lead to water accumulation inside the autoclave, uneven steam distribution, and significant thermal losses – ultimately resulting in reduced product strength, inconsistent curing, and increased operational costs. The Keda EcoSteam automatic drainage system is engineered to eliminate these risks through an intelligent, maintenance-free design that ensures high-performance operation under all conditions.

Zero Water Accumulation in Autoclave – Enhanced Efficiency and Visible Quality Gains

Through intelligent mechanical drainage, the system ensures that no condensate water is left inside the autoclave. This complete drainage leads to more uniform steam distribution and a drier curing environment, which in turn boosts autoclaving efficiency by more than 30%. The result is not only reduced steam consumption, but also visibly improved product consistency, dimensional accuracy, and compressive strength.

The Keda EcoSteam drainage system features a purely mechanical structure.

Zero Steam Leakage – Maximized Thermal Retention and Energy Savings

Equipped with advanced sealing technology, the system ensures that every joule of thermal energy is preserved. This airtight drainage design eliminates all steam leakage, which is a common problem in traditional drainage methods, leading to significant heat loss. By retaining full thermal efficiency, the system not only lowers energy costs but also reduces the load on the boiler and other steam-supplying equipment.

Zero Maintenance – Fully Autonomous, 24/7 Operation Without Downtime

The Keda EcoSteam drainage system features a purely mechanical structure without motors or electronic components. This design enables it to operate continuously and autonomously, with no need for electrical input, control wiring, or scheduled maintenance. Its robust, fail-safe mechanism ensures dependable performance in harsh industrial environments, making it ideal for modern AAC plants focused on automation, reliability, and low operating costs.

Comprehensive Waste Heat Recovery System

The core of Keda's waste heat recovery system lies in its use of high-efficiency heat exchange technology to quickly cool down and recover thermal energy from the waste steam and high-temperature condensate discharged from the autoclaves. The recovered energy is transferred in the form of circulating hot water to key areas of the plant – such as the pre-curing room – creating a closed-loop thermal system that maximizes energy reuse.

This system comprises key components including heat exchange units, pipelines, pumps, valves, and radiators. It achieves a heat recovery rate of up to 90%, thanks to intelligent thermal network balancing and multi-stage exchange and regulation technologies.

By utilizing nearly all available waste heat, the system significantly reduces steam demand. The solution lowers total energy costs, and its modular design allows seamless integration with existing equipment.

CO_2 emissions are constantly reduced, along with the elimination of waste steam emissions – helping factories meet stringent environmental standards.

By converting discarded steam into a valuable resource, Keda's waste heat recovery system enhances both sustainability and profitability in AAC production.

The Keda EcoSteam AAC solution is meant to be more than a technical upgrade – it's a strategic response to the evolving needs of energy-intensive industries.

The Keda Waste Heat Recovery System has already been applied in multiple projects.

By integrating intelligent steam control, automatic drainage, and waste heat recovery, the system addresses key inefficiencies in AAC production and transforms steam from a cost burden into a managed and optimized resource.

This comprehensive approach delivers clear benefits, including notable reductions in steam consumption and overall energy costs, improved curing stability, enhanced product quality, and significant cuts in carbon emissions. These outcomes not only support AAC producers in meeting evolving environmental standards but also strengthen their operational efficiency and long-term competitiveness.

The modular, factory-adaptable design of EcoSteam makes it accessible to a wide range of AAC producers – from greenfield projects to existing lines seeking energy upgrades. As the construction materials industry moves toward a low-carbon future, such system-level innovations can be the key to sustainable growth.

Keda's EcoSteam solution embodies the shift from passive energy consumption to active energy management. It enables AAC manufacturers to align operational goals with sustainability commitments, and positions Keda as a reliable partner in building a more energy-efficient industry.

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