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# 24/7 steam: Reliable and energy-efficient production processes for Amino

What are amino acids? They are essential building blocks in the human body and are indispensable for good health. Amino GmbH produces highly purified amino acids for applications in the health, pharmaceutical and baby food industries. This requires huge amounts of steam 24/7, 365 days a year. The new, fully equipped Bosch steam boiler system provides maximum efficiency, automation and reliability.

Creating the future: Amino GmbH in Frellstedt, Germany

Non-stop operation: Amino GmbH, based in Frellstedt in Germany, develops and produces highly purified amino acids for customers in the pharmaceutical and medical industries 24/7, 365 days a year. For a number of years, a steam boiler system from Bosch has been supporting the production process and supplying essential energy for, among other applications, vaporisation and drying, as well as heating up containers. When Amino considerably expanded its production by 50%, the company once again opted for Bosch technology. The new production section currently requires up to 6 t/h of steam for high loads and around 3 t/h during normal operation – with an upward trend. The steam demand must be met continuously.

„We expect an accordingly high level of flexibility in automation to address the areas of reliability and saving energy in our production processes," emphasises Kai-Philipp Thomas, Site Development & Technology at Amino GmbH. There is also high potential for savings in the condensate system. There is up to 99% return flow from production because the steam does not come into contact with the product. Likewise, there is production water suitable for use as a heat sink for waste heat recovery. In order to implement these requirements, Amino has two experienced experts on board: Bosch Industriekessel for the boiler technology and B+B Engineering as the system construction company.


Kai-Philipp Thomas, Amino with Volker Heiß, B+B Engineering, and Daniel Gosse, Bosch Industriekessel

„We expect a high level of flexibility in automation," Kai-Philipp Thomas, Amino

## Control and automation

The company uses a two-boiler system of type UL-S, which is redundant and designed for 72h operation without constant supervision. Each boiler can generate up to 8 t/h of steam. Thanks to Bosch's project-specific, programmed control technology, Amino has a networked, automated system. All of the communication between the boiler and module controls takes place centrally via the SCO system control. Intelligent features, including the integrated multi-boiler control, ensure a stable and fully automatic steam supply. The boilers are switched on and off via the steam pressure in the network, enabling them to interact in a targeted and cost-effective manner. The system can be started up gently and evenly during cold starts and is protected against unnecessary loads in normal and standby operations. To achieve this, a start-up function that automates and monitors the entire process is used. Another crucial factor in ensuring safe system operation and the long service life of all components is the water quality. Rather than having to carry out manual tests, the water analysis device from Bosch measures the pH and oxygen values and provides the results to the SCO. Further data processing is handled by MEC Optimize, a digital boiler assistant that supports the boiler attendant and operator with recommendations for action and which facilitates many operations in the boiler house. The assistant evaluates all of the operating data and helps to quickly detect energy losses. MEC Optimize also has a digital boiler logbook that interprets the entered data and provides instructions. Another benefit is the condition monitoring that makes predictions regarding the remaining service life of components, which facilitates effective maintenance planning. The entire control system, including the boiler assistant, communicates with Amino's central control room. Bosch has configured corresponding interfaces in advance, as well as the project-specific control software. The automation technology is rounded off by an alarm management system, which informs the boiler attendant or on-call person of important events by text message or e-mail. This ensures a quick response if necessary.


Digital efficiency assistant MEC Optimize


System control and water analysis device

## Water and condensate

The boiler system is rounded off by the components for water treatment and condensate management, including the relevant chemical dosing devices. The WSM-V water service module thermally processes fresh feed water and stores it. This is a reliable process that keeps the steam boiler water free of corrosive and other harmful substances. Hot condensate is also suitable as boiler feed water and saves a lot of energy: Compared with the use of fresh water, fuel savings of up to 12% are possible and water and chemical requirements are also reduced. High-pressure condensate, which is also used at Amino, is particularly efficient. Its high temperature level avoids heat losses in the form of expansion steam. In order to use the high condensate return rate from production, Amino had a complex high-pressure condensate network constructed. The central component is a high-pressure condensate system from Bosch that collects the condensate, temporarily stores up to 14 $m^3$ at an overpressure of 1.5 bar and feeds it into the boilers using pumps. Special attention is paid to the monitoring of foreign substances when using the 127 °C hot condensate. If there is contamination, for example from alkalis, acids or harshness, the medium is discarded. During the discharge, fresh water is immediately used from the water service module to avoid any interruption in the supply. This all takes place completely automatically via the SCO system control. Maintaining continuous communication with the overall process, the system is always ready for operation and can even process considerable variations in production loads without any problems and provide high-quality steam.

## Energy efficiency

When it comes to saving energy and reducing emissions, the boiler system features other equipment, such as two flue gas heat exchanger stages. The combination of the economiser, which is directly integrated into the boiler, with the condensing heat exchanger enables fuel savings of up to 14%. The recovered waste heat preheats the feed water for the system. In addition, production water can be heated with the waste heat, reducing the energy demand at other points in production. The flue gas temperature can be reduced to below 90 °C before it is released into the outdoor air, which reduces both emissions and energy costs. The modern burners and combustion chambers are ideally adapted to each other – the system already achieves values below the strict emission limits for 2025 (Germany). What's more, the variable speed burner fan and a combustion control with an oxygen probe ensure that the system only uses as much power and fuel as is actually needed.


Water service module and high-pressure condensate system

System components from Bosch ensure reliable, automated and sustainable processes for Amino


Boiler control

Combustion control


Water analysis device


Economiser and condensing heat exchanger

# Summary

„Creating the future“ is Amino’s motto on its path to innovation. This also includes using future-proof technology that meets high expectations for automation, reliability and efficiency. At the same time, efforts must be made to advance the trend and requirement for greater sustainability. As at countless other industrial companies, heat production is a core issue and essential to manufacturing key goods for daily life and medicine. „We’re a solutions provider for boiler houses of the future. Our motivation is to individually configure and manufacture steam and heat generators in order to enable sustainable, reliable and cost-effective production processes,“ says Daniel Gosse from the Bosch Industriekessel team. „Together with B+B Engineering, we’ve made a system for Amino that meets reliable and highly efficient 24/7 operation, in particular thanks to a high degree of automation,“ adds Mathias Trinks, the responsible Bosch Sales Engineer.


„We’re a solutions provider for boiler houses of the future“, Daniel Gosse, Bosch Industriekessel

## Companies involved

Operator: Amino GmbH
**www.amino.de/en**

Our partner: B+B Engineering GmbH
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We are: Bosch Industriekessel GmbH
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