Newsletter
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BOSCH
Invented for life

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In Focus

Bosch Industrial has been providing customised system solutions for producing thermal and process heat in the brewing and beverage industry for over 150 years. The boilers win over customers with their high load flexibility, all-round efficiency and automation. To mark the start of the BrauBeviale trade fair, this issue presents a number of fascinating reference projects from this segment.

We hope you enjoy reading all about them.

New brewing site for traditional Gaffel Kölsch beer **Production extension with Bosch steam boiler** Steam consumption reduced by 50 per cent

For the extension of its production, the privately owned brewery Gaffel Becker & Co. OHG decided to implement a new steam boiler plant from Bosch. The production capacities at the Eigelstein location in the centre of Cologne were too small for satisfying the production demands. Up to four million litres are produced every month, trend increasing. The portfolio ranging from the traditional Gaffel Kölsch beer up to liqueurs and refreshing soft drinks. The new brewing site in the South-Eastern part of town, Porz-Gremberghoven, is a better location in terms of logistics, but also provides more effective production conditions. The new process heat supply also contributes to this: With the more efficient Bosch boiler system and the improved brewing equipment, the steam consumption could be reduced by 50 per cent. In addition, the brewery can profit from an evenly high steam quality and efficiency at all load ranges. The installation of the entire steam boiler plant was done by the engineering company Dankl Dampfsysteme.

The selected Bosch boiler type UL-S can provide up to 8 000 kg steam per hour for the high process heat requirements in the brewery. And there are also further energy consumers, such as CIP plants for cleaning and the dealcoholisation plant. The industrial boiler is designed for the sudden load changes of the steam consumers, typical for a brewery. Due to the large control ratio of 1:10 of the natural gas burner, the plant operates flexibly and efficiently at every operating point, even

Brewing beer is an energy-intensive process. Most of the heat consumption is generated in the brewhouse, mainly for mashing and cooking. Modern energy supply plants help to reduce operating costs and emissions.

Since 1908, the brewery produces the traditional Gaffel Kölsch. Kölsch is a kind of beer with a protected geographical designation of origin. Only breweries in Cologne and of the Cologne brewery association may produce the beer speciality.

low loads are covered efficiently. Another advantage is the speed controlled burner fan. Electricity savings are the result for the brewery, thanks to a reduction of the fan speed depending on the current burner output.

High efficiency is a very important aspect in the energy-intensive brewing process. With the integrated flue gas heat exchanger of the boiler, the steam demand for heating the feed water and thus the fuel consumption during steam generation are reduced. The boiler efficiency is around 96 per cent. In order to keep emissions low, the natural gas burner has an internal flue gas recirculation. Part of the flue gas is returned from the combustion chamber to the burner mixing device. This lowers peak temperatures in the flame and thus considerably reduces the thermal formation of nitrogen oxide – a contribution to the environment. In addition, the integrated oxygen probe enables evenly high burner efficiency and reduced fuel consumption.

The high degree of automation of the steam boiler plant offers optimum user comfort and allows intelligent data analysis. The SPS based boiler control BCO records and saves all important operating data, such as for example the amount of burner starts, cold starts or desalting values. With the software Condition Monitoring, this data can be displayed and evaluated efficiently. Also the feed water deaeration and chemical dosing are completely automated and designed to demand.

High data transparency is the precondition for constantly low energy consumption.

In summary, the Gaffel brewery profits from an dynamic steam supply, that is entirely energy-efficient and customer-specific configured. But not only in the technical range, also in design, Bosch showed flexibility. Instead of the common red/grey combination, the boiler is designed in the Gaffel corporate colour dark blue. The control cabinets are in stainless steel, just as required by the customer.

Further information are provided in our reference report at www.bosch-industrial.com under “About us – Documents – References”

Efficient steam generation at NÖM dairy

Due to production extension at the Baden location in Austria, the NÖM dairy has a higher steam demand. Every day they process about a million litres GMO-free milk into fruit yoghurts, fruit drinks and many other dairy products. The amount of energy needed for pasteurising, ultra-high temperature heating, cleaning and sterilisation is high and a reliable process heat supply is crucial for these processing steps. Achieving the best possible energy efficiency was the aim when extending the steam supply, not only because of energy costs, but also for the protection of the environment.

The energy plant at NÖM comprised two boilers. One of it had to be removed in order to make room for a larger steam boiler. It came from the Bosch factory in Gunzenhausen (Germany) and can provide up to 14 500 kilograms of steam per hour. Already for the last steam generator in 2010 the same boiler type was selected, at that time still branded Loos (today Bosch). This steam generator is now mainly used for supply reliability and assures uninterrupted production during service and maintenance work on the new steam boiler. Thanks to excellent coordination of the responsible plant engineering company Edtmayer Systemtechnik, the implementation of the identical boiler type in the existing steam network went very smoothly. A special challenge was however the positioning

For efficient and flexible use: The two steam boilers UL-S at the NÖM dairy.

The headquarters of the NÖM dairy in Baden, Austria.

due to restricted space in the buildings at the Baden location. The boiler, which measured 7.5 metres long and 3.2 metres wide, was inched between two concrete pillars and then gradually turned into the boiler house.

In order to provide the steam for the dairy in an efficient way, the Bosch boiler is equipped with two flue gas heat exchangers. The first integrated economizer uses the hot flue gases from the boiler to preheat the feed water very effectively. Consequently, the fuel consumption for steam generation is reduced and the flue gas temperature decreases to 115 °C. In addition, the downstream condensation heat exchanger uses the condensation heat of the flue gas for heating the cold fresh water from 12 to 85 °C. Up to 6 100 litres of water per hour can be heated in this way. Air contaminants, such as carbon dioxide and nitric oxide, are reduced to a minimum at all operating points. Furthermore, the modern natural gas burner operates with very low emissions and covers even partial load ranges efficiently. Comprehensive support provides the fully automated control for 72 hour operation without constant supervision. It reduces the operation effort and protects against possible operating errors. In addition, the control evaluates important boiler system data – for a preventively and efficient plant operation.

In summary, the new steam boiler system enables economical and sustainable milk processing. The efficiency-increasing components help to reduce fuel consumption and protect the environment by considerably minimsed CO_2 emissions. Gerhard Bartak, the project manager responsible at NÖM dairy, is very satisfied with the realisation:

„Bringing the steam boiler into site was a huge challenge for all those involved. But all the effort was worth it when one looks at the achieved efficiency of 102.7 percent and the very effective operation of the system. It was only due to the 100-percent punctuality of the Bosch delivery and the precise planning by Edtmayer, that the installation process went without a hitch.“

Automated compact boilers for mineral water production

At the beverage manufacturer and bottler Poděbradka, many plants are supplied with process heat in form of steam. This comprises, e.g., the warm water production, pasteurisation of sugar solutions and different cleaning processes. The existing steam generators had been in operation for over 20 years. By optimising automation and efficiency, a lot of savings were to be expected. For renewing the plant, the specialists for industrial boilers from Bosch Czech Republic, offered an optimal solution: an overall system with two steam boilers U-MB and module technology that convinced in terms of economy, but also in terms of higher operating convenience.

With the function SUC (Start-up Control), the boiler is started up fully automatically and exactly according to operating instructions. The operator is relieved from extensive manual activities like the stepwise opening of the main steam valve. Integrated protective equipment ensures a smooth heat maintenance and normal operation. The program SUC can be called up via the boiler control BCO. The BCO offers in addition high data transparency and detects inefficient operating behaviour at an early stage. A wide range of data, such as for example boiler load, burner starting frequency or desalting amount are analysed and evaluated. In addition, the BCO automatically controls the desalting and blow-down process. This automated procedure not only saves working time, but also large amounts of feed water, energy and chemicals for water treatment.

Complete system from a single source: Bosch delivered the steam boilers and modules for feed water deaeration and condensate recovery as complete unit. With intelligent control features and automation equipment, the operating comfort has been increased considerably.

For more than a century, the town of Poděbrady with its therapeutic baths has been a popular spa resort. Already at that time, the water came from the mineral sources of the town of Poděbrady and was known for its high content in carbon dioxide, magnesium and calcium. It was filled in bottles for the first time in 1908. Today Poděbradka produces about 1.5 million hectolitres of natural and flavoured mineral waters as well as different kinds of lemonades.

The modular plant equipment for the compact boiler U-MB can be configured according to customer requirements. Besides automation and control equipment, Poděbradka also opted for modules for heat recovery, thermal water treatment and condensate recovery. All components were delivered by Bosch as complete units and only a few connections were required on-site for starting operation. The integrated economizers help to keep energy usage and CO_2 emissions to a minimum. They preheat the feed water with the boiler flue gas heat, before it is used for generating steam. But not only waste heat, also condensate from the steam consumers can be recovered. Using the condensate service module the condensate can be returned to the water circuit. This minimizes the system‘s own consumption and saves fresh water. The thermal deaeration of the feed water is crucial for providing a continuously high steam quality and a long service life of boiler and components. In the water service module it is heated to 103 °C in order to remove dissolved gases such as carbon dioxide and oxygen. This is followed by an automated, demand-driven dosing of corrosion inhibitors via the control of the deaeration module.

The integrated economizers use the boiler flue gas heat for feed water preheating and thus reduce the use of fuel.

Quick and competent implementation: New boiler plant for Püls-Bräu

The experienced plant engineering company Ago AG from Kulmbach, Bavaria has implemented together with Bosch Industriekessel a new heating boiler system for the Püls-Bräu brewery in Weismain, Bavaria. A special challenge was to implement the boiler in a very short time: The project participants had seven days for demounting the old boiler, for positioning and installing the new boiler, and for the integration into the existing network. Any delay would have lead to high costs for the brewery, since the complete brewhouse depends on a reliable heat supply.

The compact heating boiler UT-L was installed and commissioned within a very short period of time.

The brewery had fixed end of October as date for implementation, because the seasonal utilisation of capacities allowed for this short break in production. After demounting the old boiler on October 22, 2015, the new compact heating boiler, type UT-L, was quickly brought into the boiler house. In addition, the pre-mounted components, such as firing, flue gas heat exchanger and safety equipment saved lots of precious time for installation. Thanks to detailed previous planning and preparatory measures by Ago, the work was already completed at midday on October 28, 2015, and the responsible Bosch customer service engineer Andreas Imsel could start with commissioning. Start-up and setting of the plant went smoothly. The control equipment, already wired and tested previously at the Bosch factory, increased working efficiency and allowed for easier connection to the central control technology of the brewery. After having successfully tested the plant on functionality and safety, and after issuing the provided proof of performance, Andreas Imsel instructed the operating personnel from Püls-Bräu. The plant was optimally adjusted to the operating conditions at the brewery in a one-day test operation.

As usual, all systems were started up on Sunday evening and brewery operation commenced as planned – with a considerably difference: Now the heat supply of the brewery for mashing and cooking is much more efficient. The new heating boiler is equipped with a heat exchanger for heat recovery. The main fuel is natural gas. The existing oil supply is used as back-up in case of supply shortages in the natural gas network. The modulating dual fuel burner is optimally matched to the plant‘s requirements and saves a high amount of electricity with the speed-controlled burner fan. In total, the boiler efficiency is improved by about 15 percent compared to the previous plant from the 1970s. The overall communication and control, such as switchover to heat maintenance mode on weekends, is effected by the central control technology. Intelligent system features, such as efficiency forecast, help to minimize losses and facilitate operation. Thanks to high data transparency, the customer service engineer can analyse the operating data and, if necessary, make adaptions during his regular maintenance service checks – for continuous high efficiency.

Data & Facts Püls-Bräu

- Family-run business since 1798 in Weismain, Upper Franconia, Bavaria
- 13 different beer specialities
- Non-alcoholic beverages from mineral waters to lemonades up to sport drinks
- Filling volume of 300 000 bottles per day

Bosch Industrial at the BrauBeviale trade fair

Energy solutions and smart remote applications for breweries and beverage producers

Using energy efficiently, saving resources, increasing operating safety and creating competitive advantages in the process: Bosch Industrial has been providing custom system solutions for thermal and process heat in the brewery and beverage industry for over 150 years. At this year's BrauBeviale fair in Nuremberg from 8 to 10 November 2016 we are presenting, among other things, the new MEC Remote maintenance system for industrial boiler plants. The operator can remotely access his steam or hot water boiler systems easily and securely and monitor relevant data quickly. An optional notification service makes it possible to send important status reports right to the smartphone. In addition MEC Remote provides online support by Bosch service experts. If requested, they can access the system control and assist the operator with remote diagnostics, software updates or parameterisation, for instance, quickly and efficiently. Another highlight is an interactive efficiency configurator for process heat. It visualises realistic saving potentials, for example by retrofitting heat exchangers or switching from light fuel oil to natural gas operation.

Visit us: hall 4, booth 313

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