

Innovative brewing technology

GEA redesigns wort boiling saving up to 60% energy

Düsseldorf (Germany), November 28, 2023 – GEA, a pioneer in brewing technology, is presenting a groundbreaking innovation for wort boiling at this year's BrauBeviale: The new GEA QBOIL process reduces energy consumption in this process step by 60% compared to conventional systems without energy recovery. This was the result of the pilot tests recently carried out by GEA in cooperation with the brewing academy of Warstein Brewery.

Less boiling, energy recovery

GEA QBOIL combines three technologies to create a highly efficient process: the Fed-Batch process with gradual addition of wort, fractional boiling and heat recovery by vapor condensation. GEA Innovation Manager Dr. Daniel Heller explains the principle: "The wort, actually only the extract-rich 80 percent of it, is boiled step by step. In addition, we recover the energy used for evaporation directly within the same brew to preheat the wort." With this lean heat cycle, GEA prevents transfer and storage losses, which can occur with modern energy storage systems with hot water tanks. This massively reduces energy consumption and increases the efficiency of the wort boiling process.

How QBOIL works

At the heart of the new development is a distillation column, which is divided into a rectification and a stripping area in order to concentrate or remove volatile wort components. A heat exchanger located above uses the wort as a cooling medium.

In the process, the pre-run tank is filled with the first wort. After first wort lautering, around half of the first wort is added to the wort kettle, and this first fraction is boiled. Meanwhile, more wort continuously enters the kettle via the heat exchanger and is lautered. The rising vapor is used in the heat exchanger to preheat the wort that is subsequently added. An innovative recirculation system returns the condensate to the column, where unwanted volatile substances are removed.

Minimizing evaporation and wort boiling time

This innovation underlines GEA's leading role in brewing technology and demonstrates the company's commitment to sustainable and efficient brewing processes. GEA QBOIL not only enables a total evaporation rate of less than 0.5% instead of the usual 4%, but also reduces the wort boiling time from approximately 80 to 45 minutes, which creates additional capacity in the brewing process and reduces the thermal load on the wort. Following the successful tests on the pilot plant, GEA will now be scaling up with a large brewery.

GEA QBOIL can be easily integrated into existing brewing plants without affecting the current brewing technology.

Even compared to modern boiling systems with energy recovery, GEA QBOIL is expected to allow energy savings of 30%. In the future, breweries will be able to do without the usual energy storage tanks because the energy is recovered directly without intermediate storage.

[Link to download high-resolution images](#)

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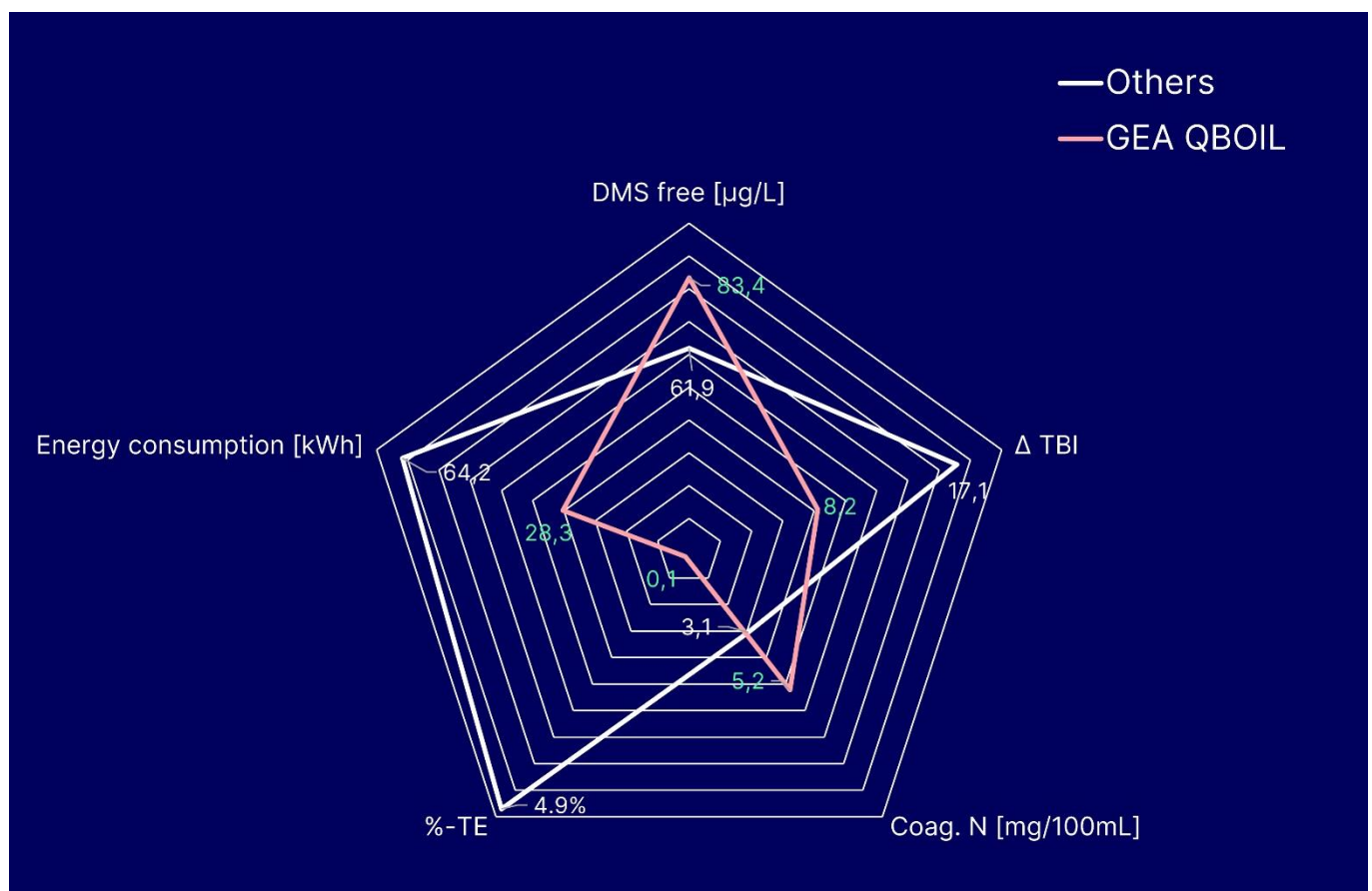
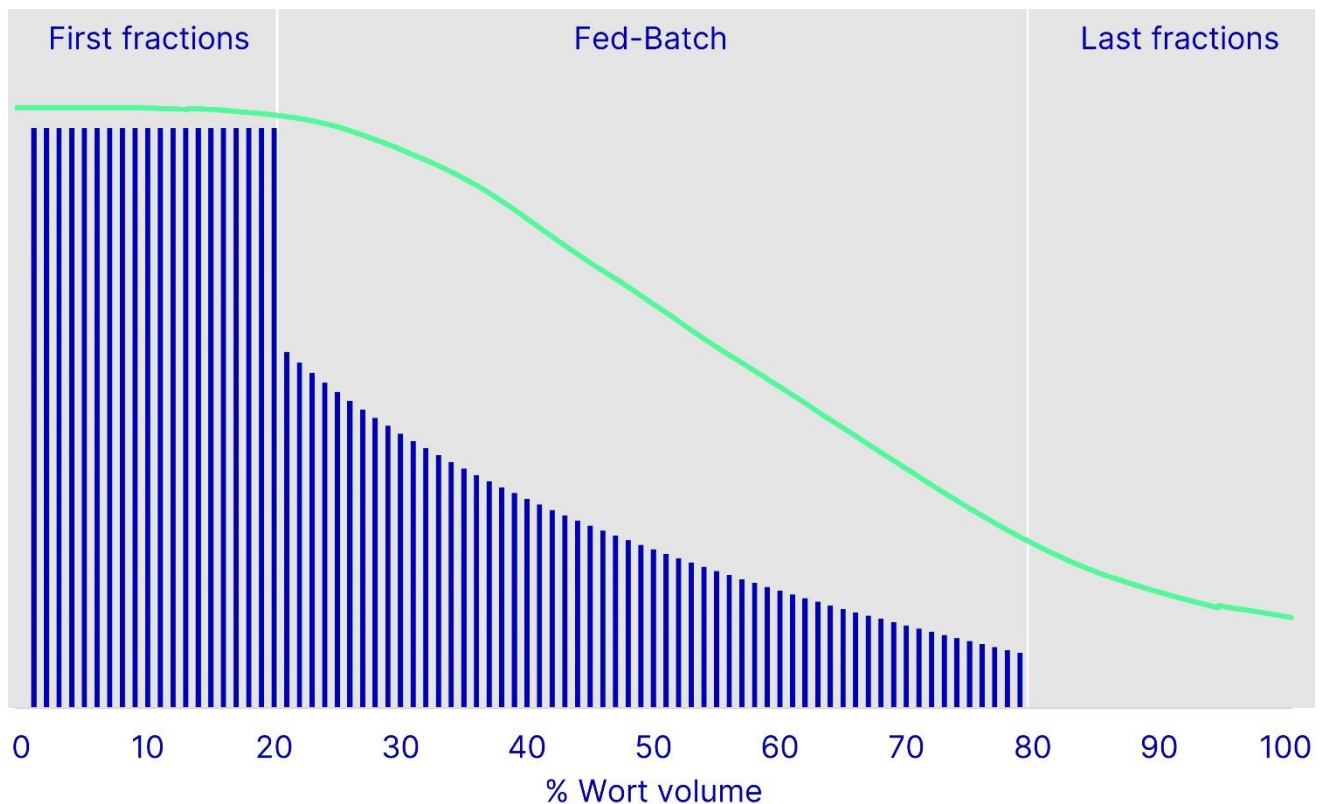


Image 1: Comparison of GEA QBOIL with classic atmospheric boiling: Tests on a small-scale pilot plant with a brew size of 5 hectoliters have shown that the thermal load on the wort (TBI), the total evaporation rate and the energy consumption are significantly lower with GEA QBOIL. The concentration of free DMS increased slightly, but remained below the limit value and the taste threshold value of <100 µg/l. The coagulable nitrogen in the final wort also increased. Source: GEA



Schematic representation of the energy input (columns) and extract content (line) of different parts of the wort

Image 2: Fractionated wort boiling with GEA QBOIL: The Fed-Batch process enables a tailored thermal energy input (dark blue columns) depending on the extract content (green line) of the lautered wort. The first wort with a higher concentration of dissolved substances, which must be thermally converted or evaporated, is boiled with more energy, while the last fractions, which consist mainly of water, no longer need to be boiled at all. The intermediate fractions of the lautered wort are treated according to their extract content. This reduces the overall thermal load on the wort while the undesirable substances are removed with the same efficiency. Source: GEA

NOTES TO THE EDITORS

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About GEA

GEA is one of the world's largest suppliers of systems and components to the food, beverage, and pharmaceutical industries. The international technology group, founded in 1881, focuses on machinery and plants, as well as advanced process technology, components, and comprehensive services. With more than 18,000 employees working across five divisions and 62 countries, the group generated revenues of more than EUR 5.1 billion in fiscal year 2022. GEA plants, processes, components, and services enhance the efficiency and sustainability of production processes across the globe. They contribute significantly to the reduction of CO₂ emissions, plastic usage, and food waste. In doing so, GEA makes a key contribution toward a sustainable future, in line with the company's purpose: "Engineering for a better world".

GEA is listed in the German MDAX and the STOXX® Europe 600 Index and is also among the companies comprising the DAX 50 ESG and MSCI Global Sustainability and the Dow Jones Sustainability Europe Indices.

More information can be found online at [gea.com](https://www.gea.com).

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