

ECOSTRIPPER

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Ecological and economical wort stripping technology

Modern breweries are investigating all possible energy savings and heat recovery measures. The strict environmental targets included in the Kyoto Protocol (CO₂ exhaust) are emphasising this trend.

Wort boiling is an important step in the production of high quality beer and represents 20 to 30% of the total amount of thermal energy consumed in a brewery. Considerable attention should be given to this stage with the aim of saving energy while improving the quality of the final product. The traditional wort kettle is not the most convenient piece of equipment for efficient evaporation and thus for the elimination of unwanted volatile compounds.

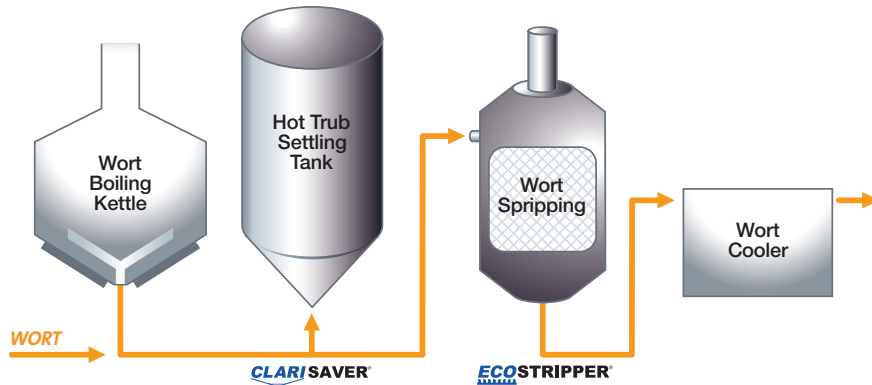
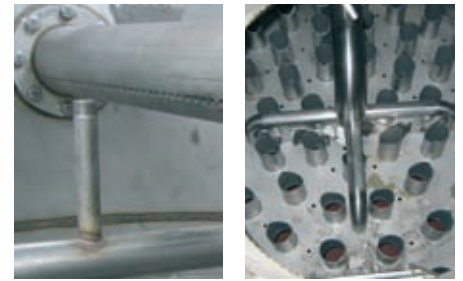
To respond to these economic, ecological and qualitative issues, **MEURA** has developed the **ECOSTRIPPER**.



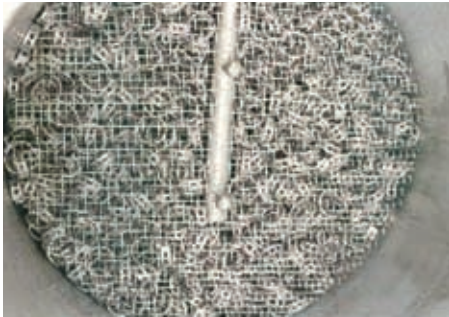
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Flow diagram of the **ECOSTRIPPER** system



Internal packing of the stripping column

MAIN ASSETS

- Significant energy savings due to reduced energy consumption:
 - less energy required (max. 2% evaporation rate) to eliminate the unwanted volatile compounds (DMS)
 - possibility of easily recovering the residual heat.
- Fulfils the strictest environmental constraints regarding:
 - CO₂ emission
 - emission of volatile organic compounds, considered as a public nuisance.
- Efficient and flexible elimination of unwanted volatile compounds in the wort (reduction up to 96% of DMS concentration).
- Increased foam stability.

- Less final wort colouration: < 1°EBC.
- Reduction of the Strecker reaction (fewer aldehydes).

TECHNICAL DESCRIPTION

The system consists of a wort kettle, a wort settling tank (or whirlpool), a wort stripping column and a wort cooler. The stripping column is placed "in-line" just before the wort cooler, after the settling tank (or whirlpool).

According to the **ECOSTRIPPER** technology, the following separate steps are distinguished:

- Formation step
The roles of the wort kettle in this step are the formation of unwanted volatile compounds, hop isomerisation, wort stabilisation by enzymatic destruction, sterilisation and hot trub formation. During this "formation step" compounds are formed by chemical reaction. The speed depends on the temperature. All these targets can be reached without any evaporation.

- Trub separation
Hot trub is separated from the wort by a whirlpool or a **CLARISAVER** (wort settling tank). The **CLARISAVER** gives the possibility of recovering hot trub during the wort cooling without any contact with air, which allows recycling the non-oxidised trub.
- Stripping step
During the stripping step the unwanted volatile compounds formed in the wort kettle and in the **CLARISAVER** or the whirlpool are stripped out by clean steam injection.

After reaching boiling temperature in the wort kettle, the wort is held in this kettle for 30-50 minutes at 100°C while being slightly agitated without substantial evaporation. Subsequently, the kettle content is pumped into a settling tank or a whirlpool. As soon as the settling time or the whirlpool rest is over, the stripping procedure begins. In this second step the wort is pumped into the stripping column filled with packing, flowing downwards, and steam is injected in counter-current flow. The internal structure of the stripping column – *the packing* – consists of several random structural products (saddles and rings) to increase the contact surface and to improve the desorption of unwanted compounds into the steam.

After the stripping column the hot wort is directly cooled and a new formation of unwanted volatiles after stripping is therefore avoided. The **ECOSTRIPPER** can easily be integrated into an existing brewhouse.

SOME REFERENCES

- FEIZ, China
- NLDC – Martens Brewery, Belgium
- Povolzhe Brewery, Russia
- Stella Artois Brewery, Belgium

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