

MEURASTREAM GREEN

Since its introduction in 2014, the Meurastream has met with immediate success, with today over 20 brewhouses operating with this exceptional technology. This energy concept enables brewers to reduce the thermal energy by about 52% compared to a brewhouse without energy recovery on the wort kettle and 35% compared to brewhouse equipped with a vapour condensation technology on the wort kettle. Furthermore, the excess hot water production is reduced by about 59%.

In 2020, Meura is launching the Meurastream GREEN. The GREEN version enables to decrease the energy consumption peaks, which makes it more compatible with renewable energy sources (possibility to operate the brewhouse with a carbon neutral resource) and to reduce even more the excess hot water!

THE MEURASTREAM

The Meurastream combines two concepts: a de-intensified boiling and an energy recovery at wort cooling to pre-heat the wort.

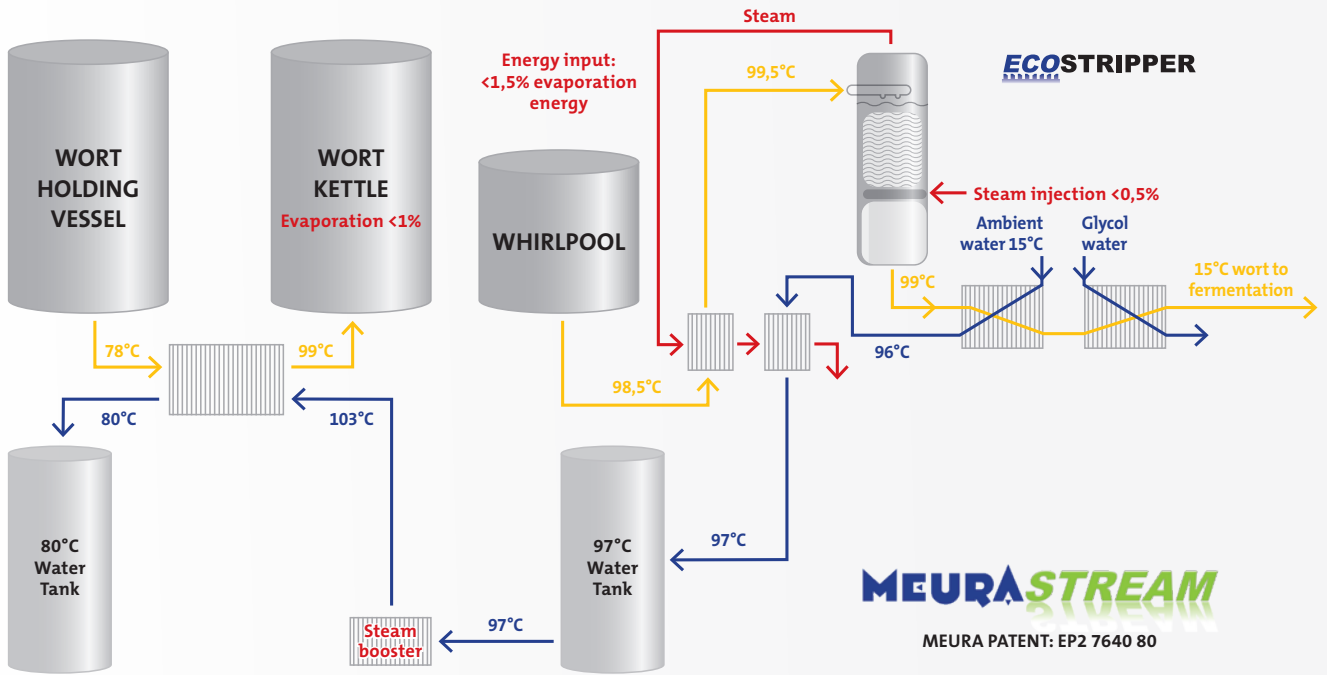
With the **de-intensified boiling**, the heat treatment of the wort and elimination of volatiles is separated into two steps. In a first step the wort is kept at boiling temperature (100°C at sea level) with almost no evaporation (less than

1% in total). All processes that need a high temperature take place in this step (formation of DMS, sterilisation, enzyme deactivation, hop isomerisation etc.). After this formation step the trub is eliminated by a whirlpool or Clarisaver. The final step, in-line with the wort cooling, is the ECOstripper, a wort stripping technology. Wort is pumped on top of the stripper and in counter-flow 0.5% steam is injected to eliminate the unwanted volatiles. The overall thermal energy in the brewhouse is lower than the energy for 1.5% evaporation!

The Meurastream Green decreases the energy peaks, which makes it more compatible with renewable energy sources and avoids excess hot water!

With the **energy recovery at wort cooling** the cooling brew water will be heated to about 96°C, instead of 80-85°C conventionally. This means that the volume of this hot water will be reduced, compared to usual lower temperature. The energy from the steam injected into the EcoStripper is partially recovered and boosts this water further to 97°C. The hot water is then temporarily stored in a very hot water vessel. For the next brew, this 97°C water is heated to 103°C with an in-line steam booster and is used to pre-heat the wort to 99°C, when pumped to the wort kettle (or formation vessel). The temperature of the brew water will be lowered from 97°C to 82°C, which is then used for mashing-in and sparging. To summarise, a part of the energy from the wort cooling is used for the wort pre-heating.

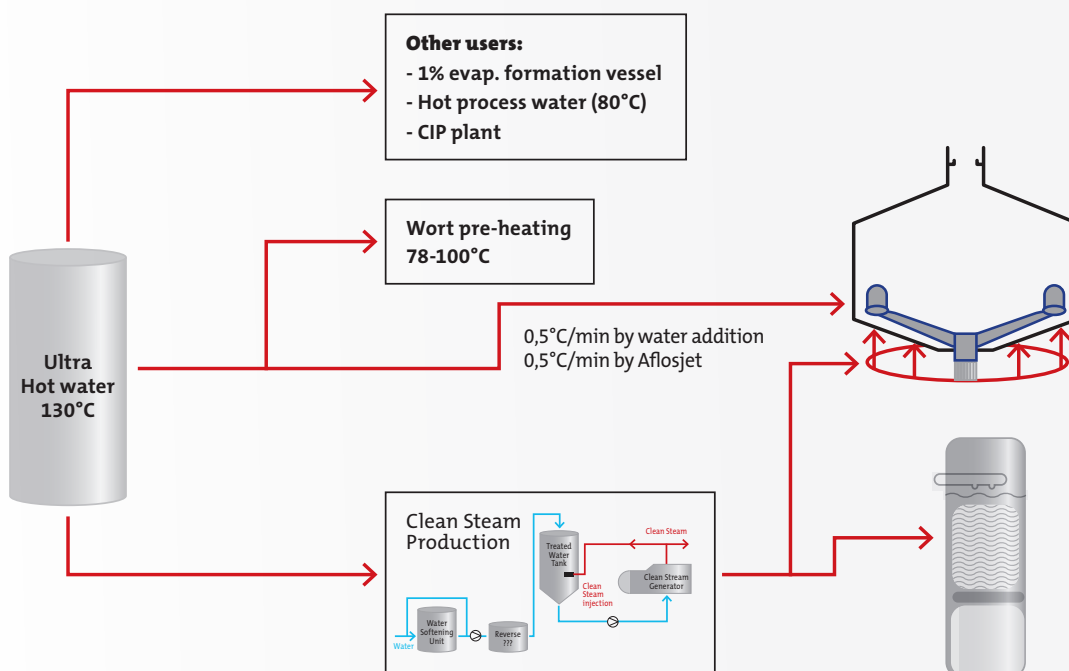
The process flow diagram below is showing the Meurastream principle.



THE MEURASTREAM GREEN

In 2020 Meura extended the Meurastream to the Meurastream GREEN. The GREEN version decreases the energy peaks, which makes it more compatible with renewable energy sources and avoids excess hot water!

The only thermal energy source of the brewhouse will be Ultra Hot Water at about 130°C. The drawing below shows the Ultra Hot Water buffer tanks as sole thermal energy source of the brewhouse.

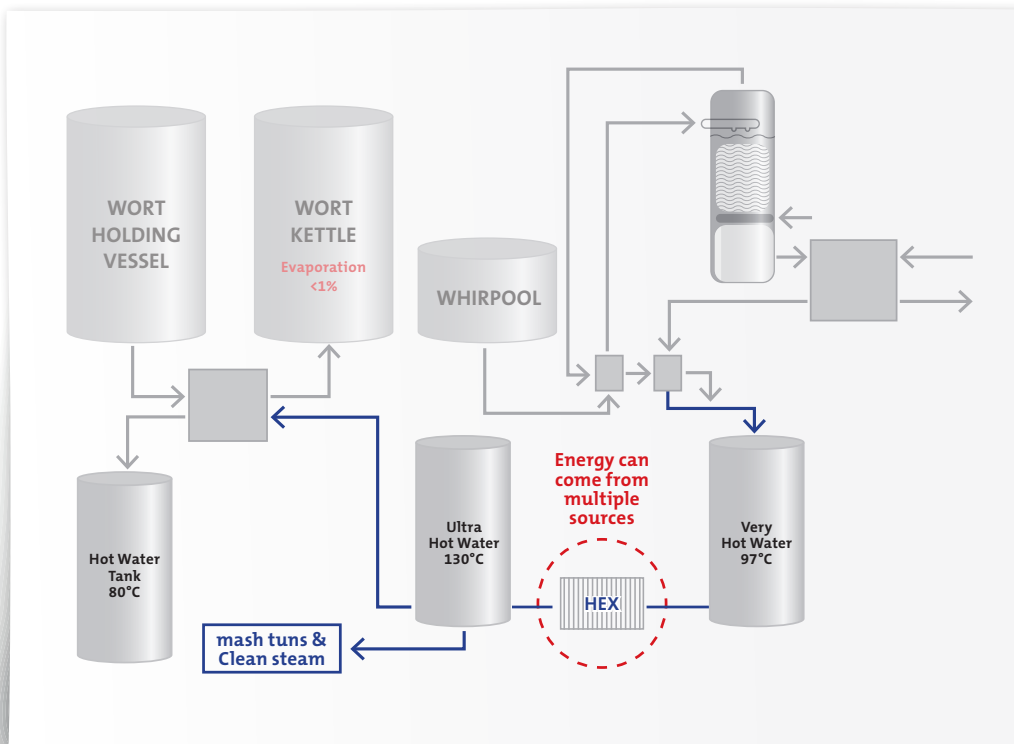


The process flow diagram below shows the production of Ultra Hot Water from Very Hot Water.

Heating from Very to Ultra hot water can be organised without having an energy peak. This opens opportunities to produce Ultra Hot Water by different renewable energy sources. An interesting solution is to connect it with heat pump technology. There is a recent development in heat pumps on industrial level that combines the heat and cold required for the complete brewhouse.

The drawing above shows how Ultra Hot Water is used for wort pre-heating. By adjusting the temperature of the Ultra Hot Water it is possible to avoid excess hot water in the brewhouse or even have a negative production if required.

The Ultra Hot Water is also used for mash heating by adding this water to the mash tun. Depending of the brewing diagram at least 50% of the thermal energy for mash heating



comes from the Very Hot Water addition. The rest of the thermal energy for mash heating comes from the Ultra Hot Water addition. This steam is produced by the Ultra Hot Water.



IN SHORT, THE MEURASTREAM GREEN GIVES THE FOLLOWING BENEFITS:

1. Possible to have a carbon neutral brewhouse. With heat pump technology it will be even possible to produce all the cold and hot thermal energy for the complete brewhouse.
2. No excess of hot process water. The ability to regulate the volume of produced hot water (even possible to go to negative if requested).
3. Solution to reduce steam peaks in a batch brewhouse
4. Each Meurastream brewhouse can be upgraded to MeuraStream GREEN

MeuraStream GREEN enables you to have a carbon neutral brewhouse!



If you are interested in this innovative new concept, do get in touch with our sales team. They will provide you with all the needed and specific information.