Technical information

Related to machine model	Subject	Date
Batch tempering machines	Energy consumption	September 2022

Professional manufacturers of chocolate-based products use either batch-type tempering machines or continuously working tempering machines. In spite of the fundamentally different tempering principles, both machine types are used frequently.

One of the differences that has become extremely topical is the energy consumption.

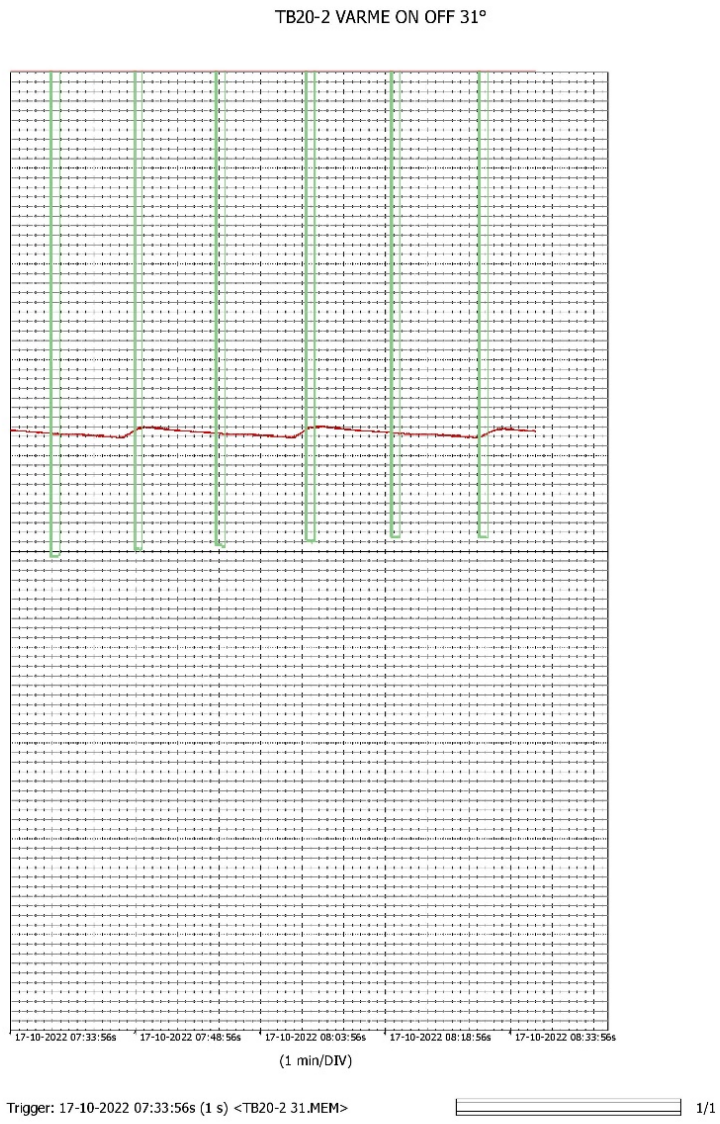
Continuously working tempering machines heat and cool the chocolate in a continuous process – hence the name continuously working tempering machine. During a working day, this type of machine may be working 8 to 10 hours and use whatever amount of energy is required.

In batch-type tempering machines, a whole batch of chocolate will be treated in three separate phases: melting, cooling and heating. Whereupon the tempered chocolate is kept at a uniform temperature.

Maintaining a uniform temperature of the tempered chocolate for one hour requires but a fraction of the energy that would be consumed by a continuously working tempering machine

The diagram shows chocolate temperatures and periods in one hour where energy is added to a 20 kg ChocoMa batch-type tempering machine, model TB20-W, TB20-1 or TB20-2.

The green vertical lines indicate the point at which the chocolate is heated (on / off are shown). The red wavy line shows the chocolate temperature.



The illustration shows that the chocolate is heated for about 1 minute in a 10 minute period. It is also shown that the chocolate temperature varies between 31.0 and 31.5°C.

The heat element on TB20 tempering machine models has an output of 0.435 kW/h and is active for approximately 5 to 6 minutes per hour, i.e. the TB20 models require 0.04 kW/h to keep the chocolate tempered.

With a 20 kg batch of chocolate in a continuously working tempering machine, the cooling compressor will typically consume 1.5 kW/h and a connected heat element would consume 0.7 kW/h – all in all a permanent energy consumption of 2.2 kW/h.

Consequently, the difference in energy consumption for the two tempering methods is 2.1 kW/h for a batch of 20 kg of chocolate. In a 40-hours workweek this will amount to 84 kW. In a year with 50 workweeks it amounts to 4,200 kW.

In times with high energy prices, all companies try to save costs for energy consuming equipment. Companies which use batch-type tempering machines cannot save any further on this process, whereas companies using continuously working tempering machines have an energy-saving alternative and can acquire economic gains.

In an age with focus on sustainable company management, companies' actions and responsibility are seen on a larger scale, and some choices are more appropriate than others. Energy consumption is no exception.