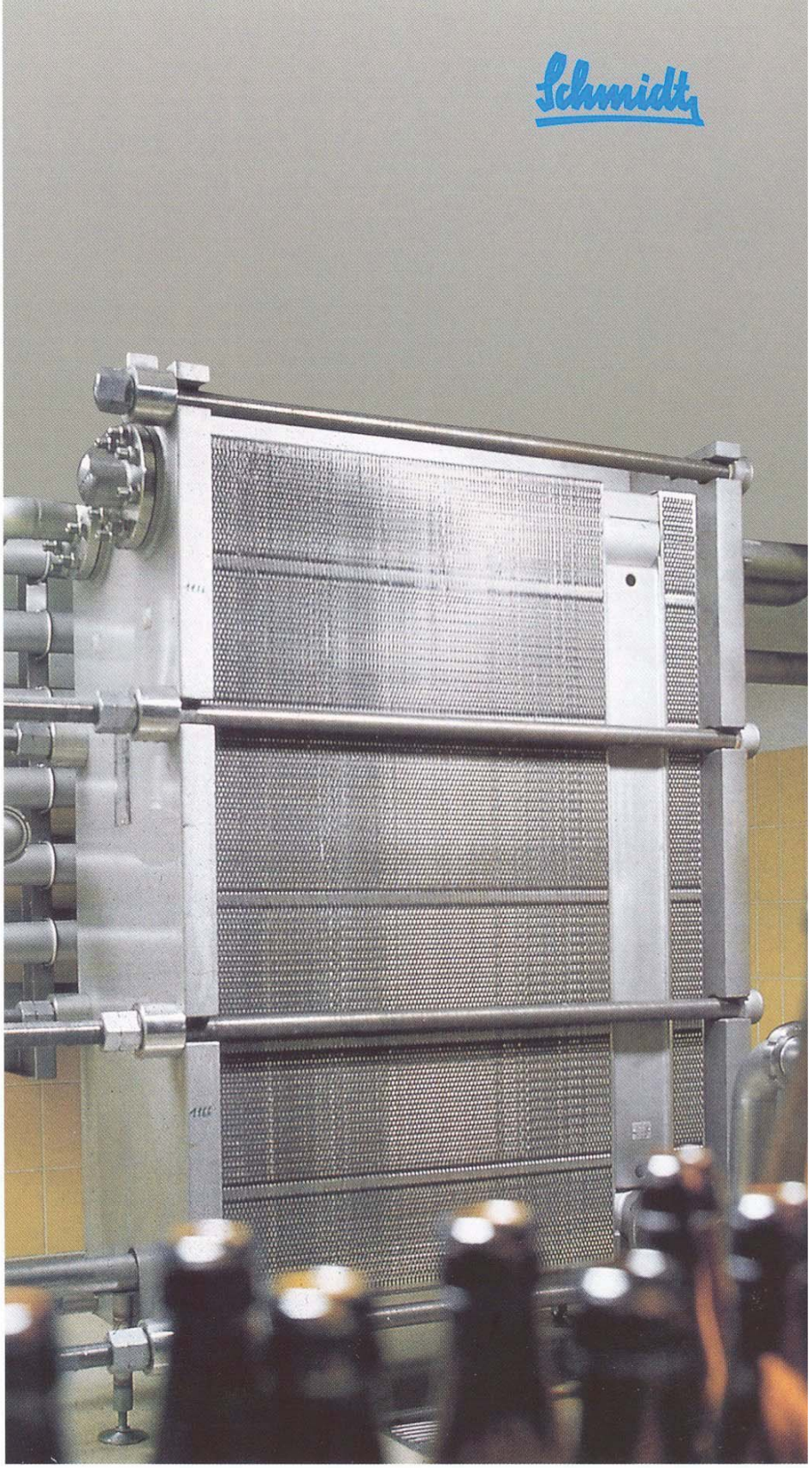


Technology for the Brewing Industry

API Schmidt-Bretten

341 e

Tradition in the Brewing Industry

1879

The foundation of the Schmidt company in Bretten can be traced back to 1879 when a patent was taken out for a counter current spraytype cooler, devised for the cooling of wort. This invention laid the foundation of modern brewing technology. The business developed from a family establishment to the highly efficient company it is today, employing around 300 people and attaining world-wide acclaim.

Compact high-performance heat exchangers have evolved from the once open wort cooler of Wilhelm Schmidt. These can be installed for cooling, heating, pasteurising, sterilising, evaporating and condensing. Schmidt appliances and thermal constructions can be found world-wide in many industrial branches, e. g. Food and Beverage, Chemistry and energy technology.

Individual and made-to-measure conceptions meet the demands of varying management requirements. General solutions are becoming increasingly important in the beverage industry.

Further development and the improvement of established techniques can be guaranteed owing to close cooperation with customers, intensive research into existing techniques, plus the allocation of development projects to universities and colleges. Wherever improvements or objective alterations of certain characteristics are necessary, e. g. in fruit processing or dealcoholising beer, Schmidt-Bretten will plan and design complete production lines, undertake the construction and on the spot installation until the equipment is ready for immediate operation.

Supply Programme for the Brewing Industry

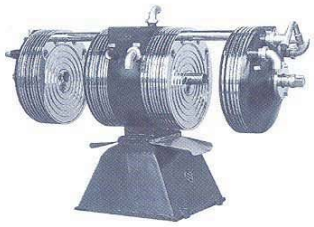
SIGMA
Plate heat exchanger and tubular heat exchanger for the heating and boiling of wort

Condensation of copper vapours, initial cooling of brewing water, heating of brewing water

SIGMATHERM
Wort-cooling, wort aeration, short-time heating of beer with control of pasteurisation units

SIGMATEC
Equipment for the production of non-alcoholic beer

SIGMASTAR
Equipment for the concentration of yeast, malt extract and wort



1932

1992

API Schmidt-Bretten GmbH & Co. KG

Top Performance by Teamwork

To support the Schmidt policy and tradition of customer oriented service we maintain subsidiary companies in the USA, in the Netherlands, in France and Spain as well as qualified representatives in many other countries.

Use of up the minute technology, flexibility, perfect trademanship plus nearly 120 years of experience add up to make Schmidt-Bretten one of the most competent, efficient partners in the brewing industry.

Equipment and Systems for the Food and Chemical Industries

Being a part of US based American Precision Industries' Heat Transfer Group we have access to their sales network as well as to their engineering capabilities.

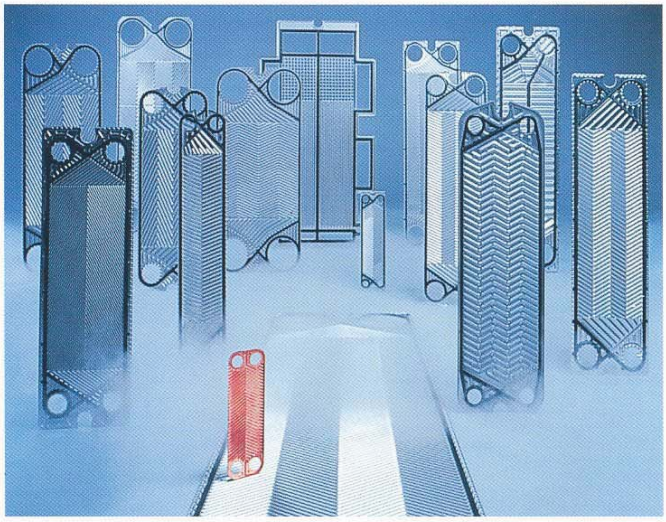
Schmidt-Bretten is a company well-known all over the world for its high-quality products

- plate heat exchangers,
- evaporators and
- thermal processing plants.

These products are used for thermal treatment of various liquids in all industries and for processing of liquid food.

Plate Heat Exchangers

SIGMA high-performance heat exchanger plates



SIGMA high-performance plate heat exchangers are the ideal appliances for solving thermal problems in the brewing industry, not only because of their compact construction principal, but also due to the favourably low cost of investment and operation.

A complete selection of SIGMA heat exchangers is available in various sizes, forms and raw materials, including adhesive or non-adhesive gaskets, according to the individual areas of usage.

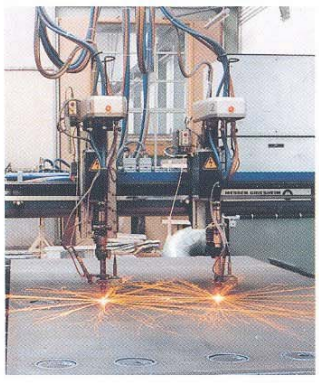
SIGMA plate heat exchangers are made to standard from stainless steel. Valuable qualities of which include corosion resistance, durability, high working pressures of 25 bar, low roughness and good cleanability. A range of special materials can be brought into operation for certain critical products.

The manufacture of SIGMA plate heat exchangers with automatic production equipment begins with the in-house fabrication of the press tools and ends with multiple stage quality controls which go together to guarantee the constantly high Schmidt-standard.

The SIGMA range of plate heat exchangers with heat exchange areas from 0,05 to 1500 m^2 can process flowrates up to 1000 m^3/h in a single machine. High thermal recovery (96%) can be achieved.

The optimal, specific construction of the equipment has been made possible for decades by practical, applicable technical knowledge together with calculator-supported programmes.

CNC-controlled cutting machine



Robot-controlled gasket glueing assembly

Wort-Cooling Equipement with Wort Aeration

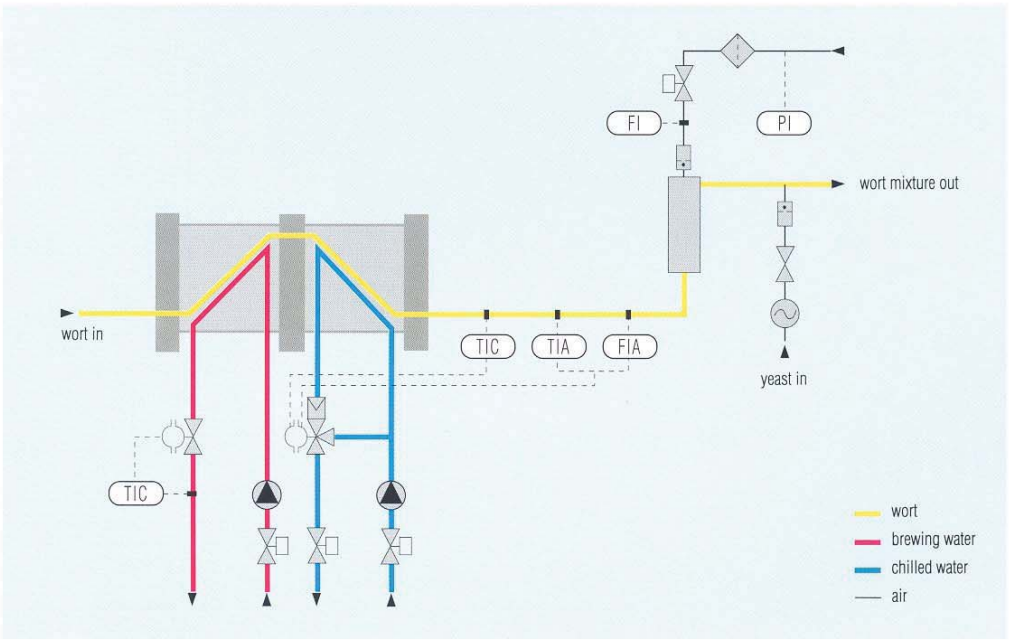
Ever since the firm originated in 1879, the cooling of wort belongs to the standard programme of Schmidt-Bretten. SIGMATHERM wort cooler can be applied to any specific usage of brewing water.

- traditional two-step construction
- the very latest modern technology has to offer with a one-step construction and stock tank for precooled water

SIGMATHERM wort cooler SIGMA 65 for 450 hl/h

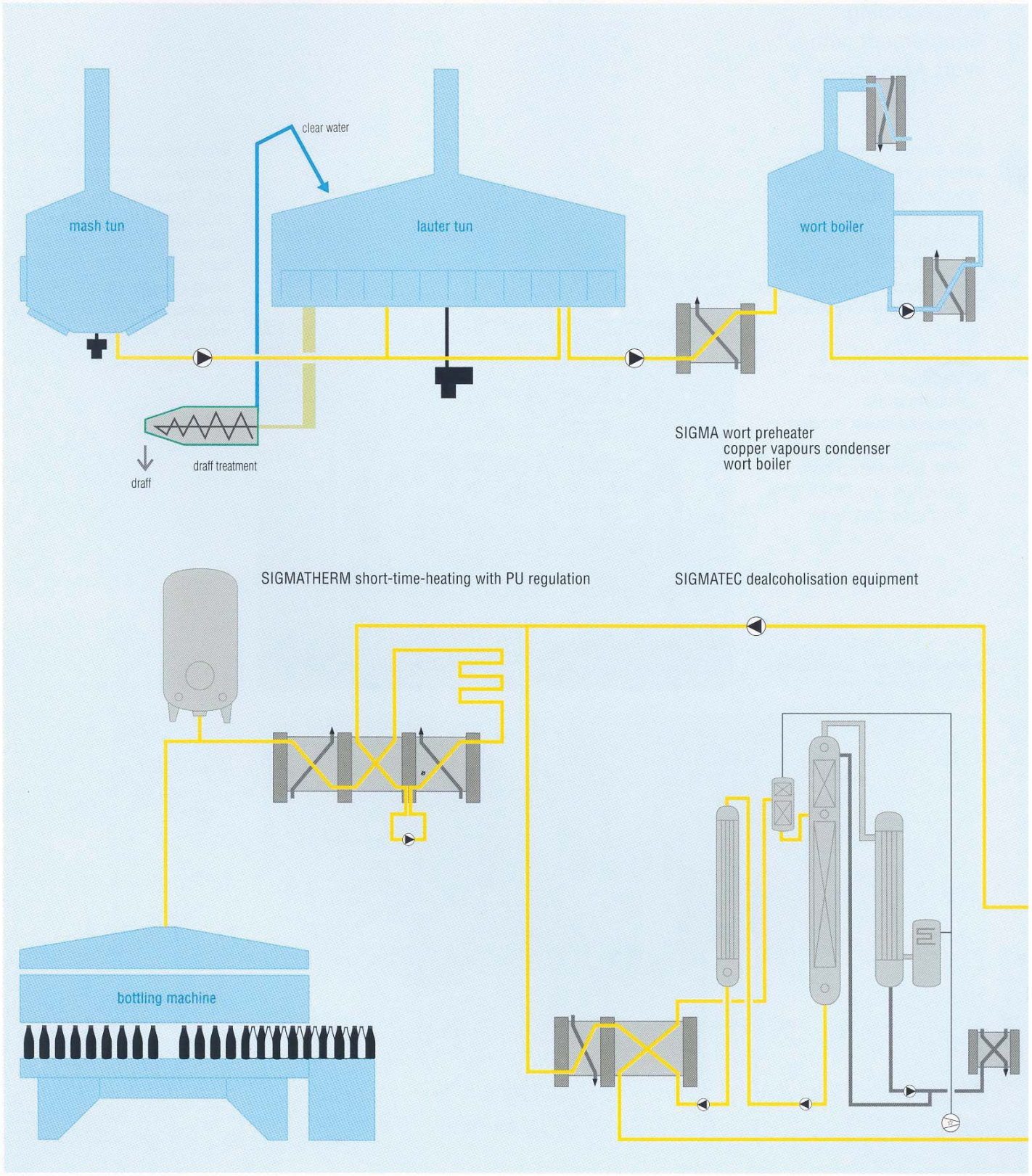
Wort aeration is usually combined with wort cooling. The exact dosage of air added plus the fine dispersion in the wort ensure optimal flotation, sufficient oxygen for the yeast and homogenity of the wort mixture.

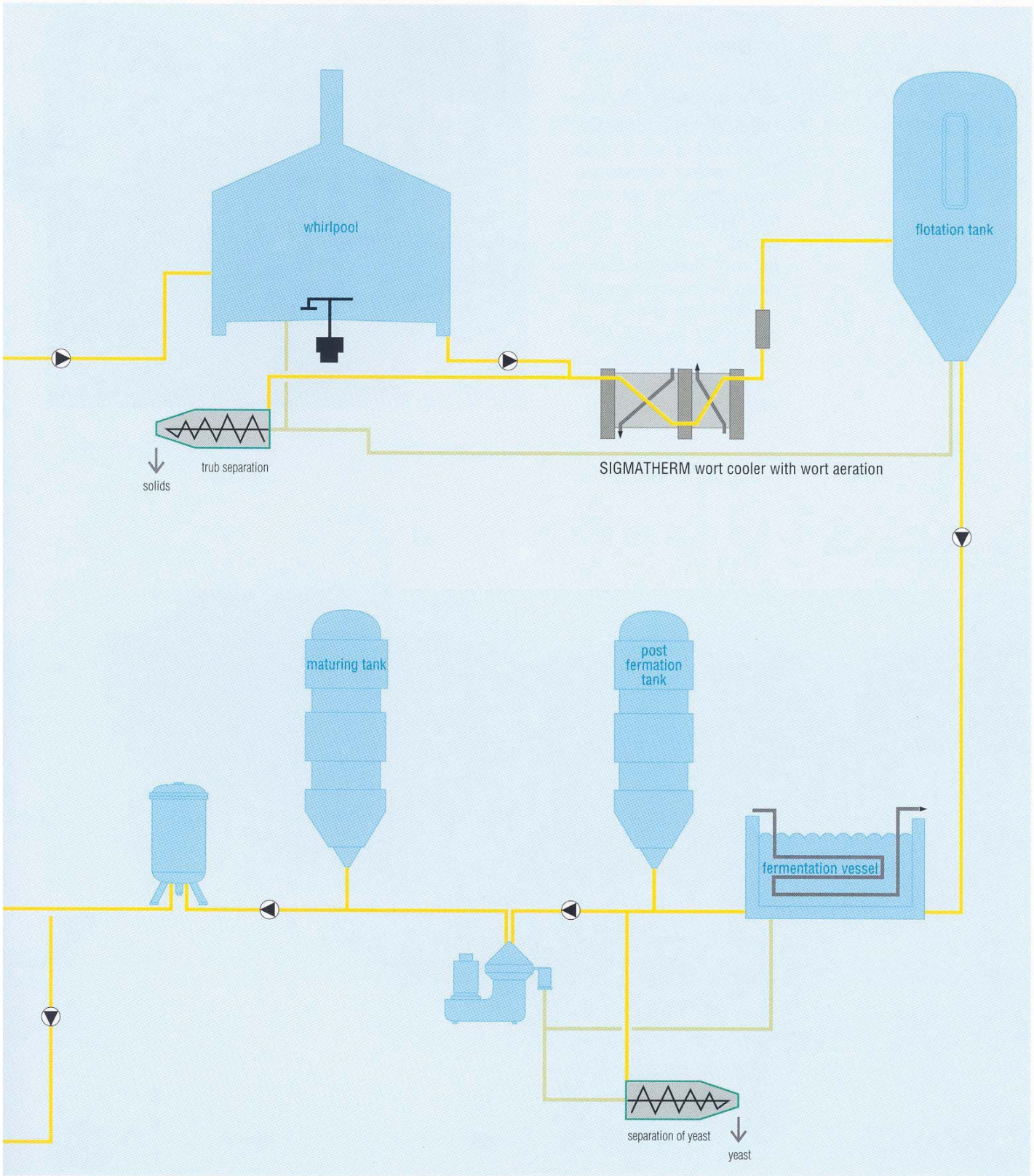
SIGMATHERM wort cooler with wort aeration and yeast dosage



SIGMATHERM wort aeration

Tecnological Processes in the Brewery



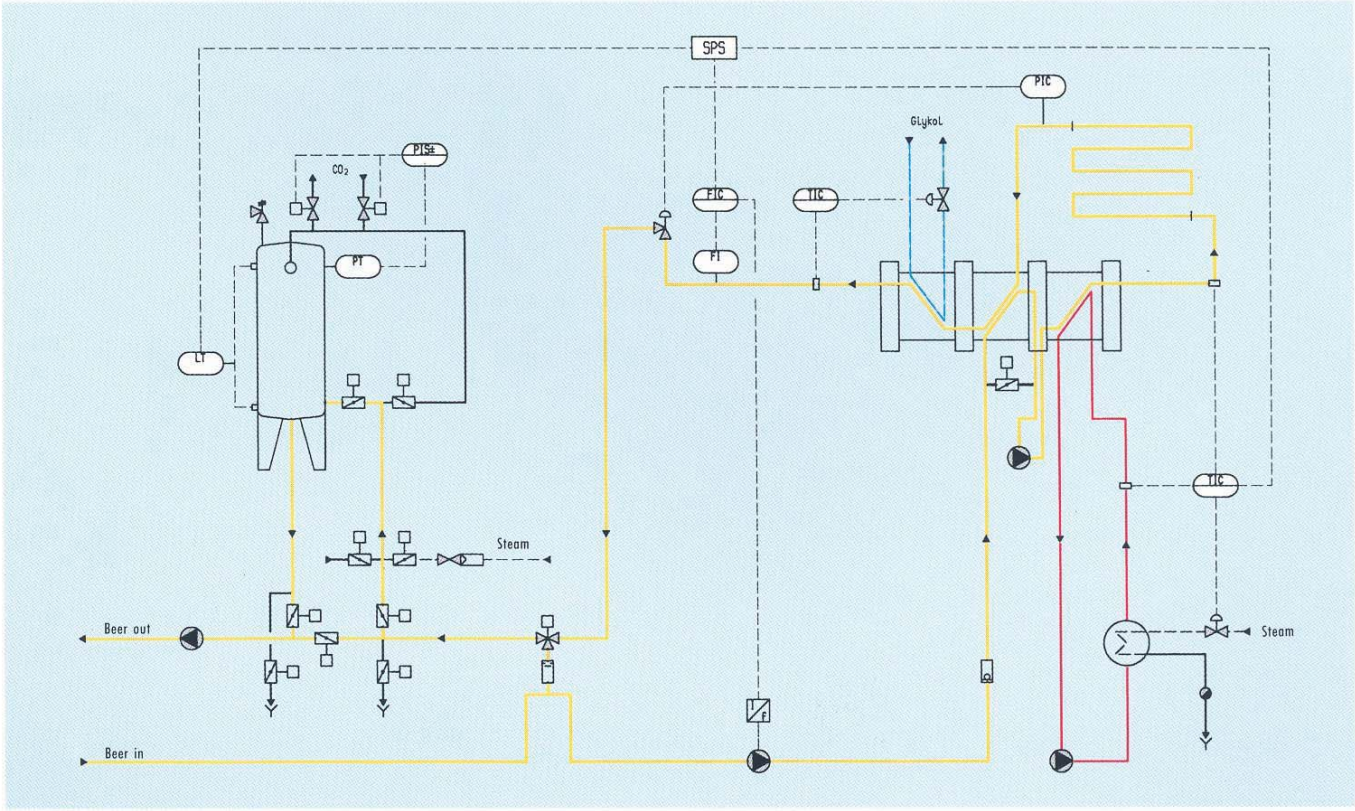


Short-Time-Heating of Beer

Short-time-heating is the classical and most practical method of conserving beer. This process ensures the manufacture of high quality, stable products, suitable for export.
Schmidt-Bretten accommodates the diverse special requirements of their customers, ranging from manually-regulated apparatus to automatic equipment with PLS control.

SIGMATHERM Short-time-heating system with SIGMA 65 for 300 hl/h wheat beer

SIGMATHERM short-time-heating with PU regulation



The standard arrangement for short time heating of beer is a three section heat exchanger, consisting of a regenerator, a heater with holding tube and a cooler. A regenerator designed for 96% heat recovery permits a final product temperature of 12 °C with feed temperature of 5 °C this in many applications the cooler will not be needed.

SIGMATHERM Short-time-heating equipment saves energy, is economical and has a low maintenance requirement.

PU-Regulation

Pasteurisation units regulation - here a common relation is brought to rule:

$$PE = t \times 1{,}393^{\vartheta - 60\,°C}$$

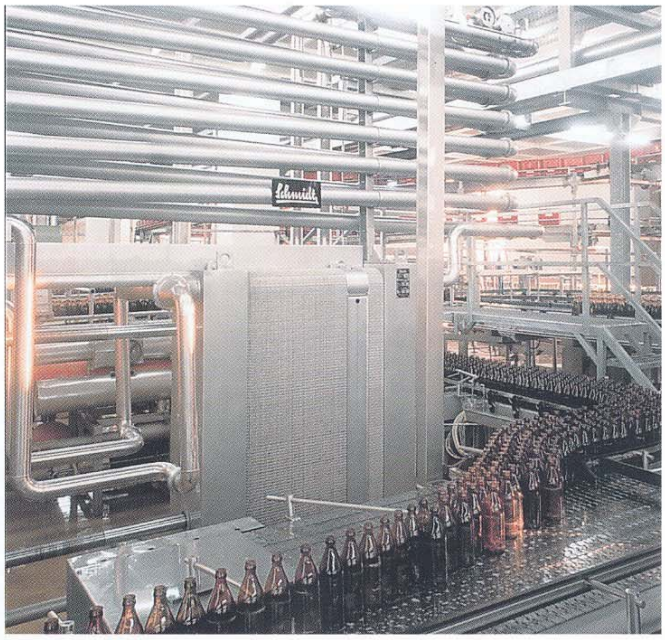
Temperature (ϑ) and time (t) determine the rate of destruction of the micro-organisms. Diverse speeds of the fluid cause the length of time the beer spends in the heated zone to vary.

The SIGMATHERM PU regulation ensures that the pasteurisation units remain constant by coordinating the altered heating periods with corresponding temperatures. The system operates independently under programmable control and quick reacting regulative circuits which in turn gives reliable protection against over-pasteurisation and disturbances in the filler.

Increase of Pressure

An additional pump is installed between the heater and the heat exchange section. Therefore the pressure on the pasteurised side of the beer is always greater than the pressure on the non-pasteurised side. This way, the reliable operation of the short-time-heating equipment can be guaranteed.

Short-time-heater for beer with SIGMA 64 plates, feed 325 hl/h



Equipment for Dealcoholising Beer

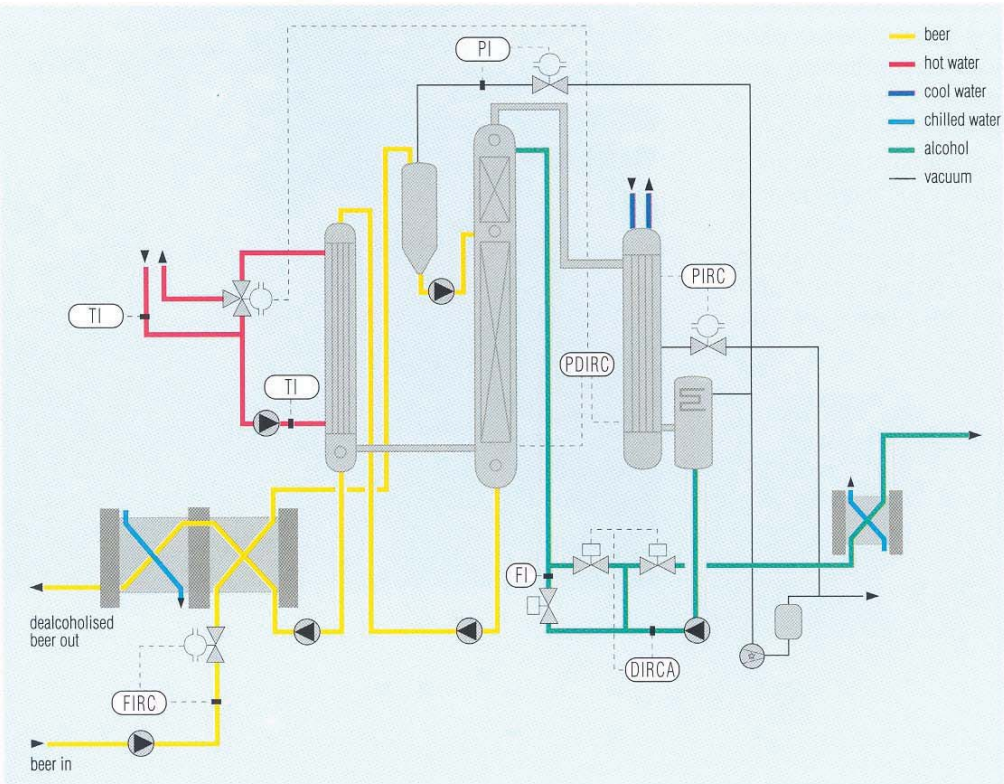
The latest development from Schmidt-Bretten is the SIGMATEC process designed to dealcoholise beer for the brewing industry.

A new procedure in the dealcoholisation of beer guarantees the very careful separation of alcohol by continuous vacuum rectification.

SIGMATEC dealcoholisation equipment

Firstly, preheated beer is decarbonated then directed to the stripping section of a rectifying column. The fluid moves down at a temperature between 43 and 48 °C while constantly evaporating and condensating vapours from the opposite direction bringing about the selective separation of alcohol from the beer. The beer is then directed from the bottom into an evaporator. In less than five seconds, vapours are produced, which are necessary for the rectification process. These are then redirected into the column, while by this time the completely dealcoholised beer is cooled in the heat exchanger, to be finally pumped out of the equipment. In this manner the thermal stress is less than that in a pasteurizer. The alcoholic vapours pass from the stripping section into the rectification section where they are concentrated to 75% alcohol by volume. By this means important aromatic components condense after which they can be redirected into the beer. The alcoholic vapours are condensed and cooled to a low temperature and stored in a tank. In the form of industrial alcohol, it is then a highly-demanded product, which can be marketed immediately

SIGMATEC-dealcoholisation with continuous vacuum rectification



Concentration Equipment

Bottom of the stripping column, condenser and heat exchanger from SIGMATEC

The extension of the brewhouse with a concentration plant secures additional profit for the brewery. SIGMASTAR evaporation equipment is particularly suitable. It combines the assets of conventional tubular or plate evaporators, has an operating range from 1-25 m^3 water evaporation per hour plus a convenient, space-saving method of construction. The concentrate extracted by this equipment promises optimal quality expectations, not only from the sensoric and analytical composition, but also regarding the final concentrate.

Extracts of malt and hops as well as beer wort can be concentrated up to 85% ds. Brewer's yeast extract up to 65 % ds and yeast suspensions can be thickened up to 30% ds.
In this manner, the various by-products from the brewery can be refined to produce valuable raw material for the chemical and food industries.

Advantages of SIGMATEC System:

- Careful dealcoholisation without any influence from external heating
- Selective extraction of alcohol, minimum loss of aroma
- Complete dealcoholisation, alcohol is reduced to less than 0,1% vol.
- Maximum blend potential with
  – krausen beer for the manufacture of non-alcoholic beer
  – with normal beer for the production of light beers
- Less than 10% loss of volume, related to the amount of beer supplied
- Operation with hot water
- Performance data: 4-100 hl/h and more
- Completely continuous and automatically controlled
- No effluent problems
- Industrial alcohol as subsidiary end-product, ready for immediate marketing

Five stage SIGMASTAR evaporator equipment with evaporation capacity of 18 m^3/h