API HEAT TRANSFER

TURNKEY SOLUTIONS FOR NONALCOHOLIC BEER & WINE

Schmidt® SIGMATEC Dealcoholization System

Health Trends and Millennials Driving Demand for Zero-Alcohol Beer

API's SIGMA**TEC** Technology Delivers 0.0% Alcohol Beer and Superior Taste

In recent years, nonalcoholic beer has been growing in popularity. Today's consumers are seeking healthier options as evidenced by the significant decline of soda consumption due to its high sugar content and link to obesity. Bottled water and juice have become more popular options, particularly among millennials, and this group is driving the sales of no- and low-alcohol beers as well. Statistics from the 2015 National Survey on Drug Use and Health found that more than 40% of 18- to 25-year-olds reported not having had an alcoholic beverage in the previous month. Nonalcoholic beer is growing in popularity because it evokes a lifestyle image more sophisticated than that of sodas and juices, fitting the social image that many people want to project about themselves.

Processes designed to dealcoholize wine and beer have been around for more than 30 years, but consumers did not always accept these products. These low-alcohol products were not the highest quality and had a less than pleasing taste, but better technology and experimentation with ingredients, strongly influenced by craft brewing, has changed that. With the right technology, removing the alcohol no longer means removing the flavor.

API Heat Transfer's Schmidt brand is the technological leader and original patent holder for the vacuum rectification process used to make no-alcohol beer. This method of dealcoholization better maintains the natural qualities of beer compared to the traditional process of filtering out the alcohol. API's exclusive SIGMA**TEC** process is the only system capable of producing 0.0% beer.

The technology can be used to produce beer with a final alcohol level of 0.0% at a capacity of 2.5 to 4.2 barrels a day.

SIGMA**TEC** Procedure

Vacuum rectification is the core engineering principle behind SIGMA**TEC** technology. This proprietary dealcoholization process guarantees a very gentle separation of the alcohol from a diverse range of alcoholic products, including beer and wine, and can be tailored to a customer's product.

For example, consider beer dealcoholization. The first step is decarbonization. Next, the SIGMA**TEC** process removes the alcohol from the product in its rectification column, the design of which is exclusive to API Heat Transfer, resulting in better flavor and a reduction in alcohol content to below 0.05%. Nearly all competitive processes for beer dealcoholization end here, but the SIGMA**TEC** process includes further treatment to achieve 0.0% alcohol.

While the product is in the rectification column, alcohol-rich vapors are condensed and cooled at a low temperature in the top of the column. These alcohol-rich vapors can be concentrated up to 85% and stored in a tank in the form of industrial alcohol. The result is a saleable product that can be marketed immediately.

SIGMA**TEC** plants have capacities ranging from 2 to 200 barrels per hour. The technology is environmentally friendly with regard to both water and energy resources. It is also adaptable for various products and formulations.

The technology advances made by API's SIGMA**TEC** modular dealcoholizing plants are becoming increasingly attractive to smaller breweries as well as craft breweries. Today, the SIGMA**TEC** dealcoholization system is used in more than 100 plants around the world.

Process Optimization

From the beginning, API Heat Transfer with its Schmidt brand has successfully established itself as the market leader in innovative and energy efficient equipment, and its engineers continue to develop and optimize the SIGMA**TEC** process. For instance, new dual-stage cooling replaces 80% of glycol with cooling water, thereby reducing operating expenses. For a plant with 100 hl/h, the savings amounts to about 1,000 kW.

Advancements in control technology are enabling operators more flexibility in plant operations. Operators can continuously adjust the performance of their plant via a PLC (Programmable Logic Control) touch screen controller HMI (Human Machine Interface) within a power range of 50-100% without having to make a single mechanical adjustment. A PLC control with ethernet capability and real-time data displays enables operators to monitor performance and avoid premature cleanings, extending the intervals between cleanings and reducing the costs for energy, CIP (Clean-in-Place) products, water and downtime.

Furthermore, automated controls have optimized the maintenance procedures. Startup, cleaning, and shutdown of the plant have improved, saving thousands of liters of water per cleaning cycle.

To learn more about API's exclusive SIGMA**TEC** process or how it can be incorporated into your plant, please email sales@apiheattransfer.com or call (877) 274-4328.

Below are the primary advantages of the SIGMATEC process:

- Consistent product quality via continuous running and efficient separation technology
- Ability to decrease alcoholic content to 0.05% or 0.0%, and >20% is possible after adding the alcohol, if desired
- Gentle treatment of the product due to low process temperatures resulting in low thermal stress
- Dealcoholization of beer minimizes product loss versus concentration
- Patented Aroma Recovery Unit enables aroma components and flavors to be recovered and directed back into the beer
- Aroma Recovery Unit is a closed steam loop and does not use plant steam, so no boiler chemicals can contaminate the final product or alter the flavor profile
- Fully automatic operation independent of the plant capacity throughout startup, production, CIP and shutdown
- Low maintenance costs because no releasing agent is required
- Concentration of alcohol up to 85%, which can be marketed as a new product
- Capacity scope of 2-200 hl/h product feed

Schmidt® SIGMATEC Dealcoholization System

Capacity: 2 h/l - 200 hl/h

For Breweries, Wineries,
And Fruit/Cider Production

Areas of Application

With more than 30 years of experience in dealcoholization, Schmidt® SIGMATEC** has become the market leader worldwide. With the experience gained in supplying a large number of dealcoholizing plants, our SIGMA**TEC** design has become highly refined.**

To date, SIGMATEC** systems have been manufactured for a scope of capacity ranging from 2 h/l to 200 hl/h.**

Breweries

Wheat beer, Pils, Pale Ale, Lager, Dunkel, Stout

Wineries

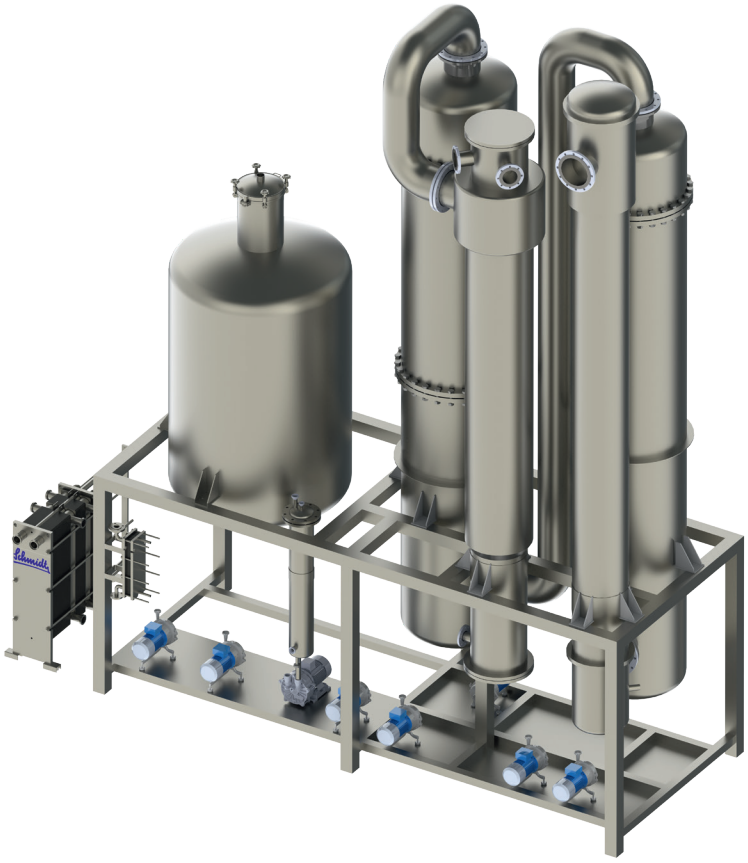
White/Red Wine, Sparkling Wine, Mulled Wine

Fruit/Cider Production

Perry, Cider

Other Industries

Alcoholic Liquids, Extracts



Advantages of the Process

- Dealcoholization under 0.05% alc/vol
- Cost-Effectiveness
  - minimum volume loss
  - alcohol concentration up to 85% alc/vol, hence a valuable, marketable by-product
  - fully automatic operation
  - low energy consumption
  - low maintenance cost
- Careful Handling of Product
  - low processing temperature
  - short holding time
- Environmentally Beneficial and Advantageous in the Conservation of Resources
- Optional Aroma Recovery
- Optional Dosing of Base Product
- Optional CIP System
- Optional Desulfurization of Grape Juice

Technical Versions

Materials and Specifications

Materials of Columns and Tanks:	All Current Stainless Steels
Column Internals:	Exclusively designed, custom structured packing and distribution
Column Diameters:	Dn 200 to Dn 2,000
Heating System:	Direct Steam or Hot Water

Capacity Data

Feed Capacity:	2 hl/h - 200 hl/h (Beer)
Steam Consumption: Cooling Capacity:	15 - 18 kg/hl 10 - 12 kw/h
Average Temperature:	40 - 80°C
Alcohol Concentration at Inlet: Final Concentration of Alcohol:	0.75 - 15% alc/vol 40 - 85% alc/vol

Our dealcoholization systems are trusted by the world's top brewers.

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