Alfa Laval non-alcoholic beer technology

- For a new generation of beer-based products
Great moments for 0.0 beer
- Taking the world by storm
Non-alcoholic beer: Zero alcohol beer sells big

More mature market with huge consumer demand for 0.0 beer

Great taste from Alfa Laval Dealc technology

Global brewery know-how and support
Non-alcoholic beer: Zero alcohol beer sells big

- What are the latest market trends and demand drivers for 0.0 beer

More mature market with huge consumer demand for 0.0 beer
High demand for 0.0 beer products
- For people who don’t drink beer and for those who do

- A great alternative for consumers who don’t drink beer or alcohol making it a growing niche for breweries
- A beer-based drink alternative for current beer consumers with clear benefits (responsible drinking, healthier lifestyles, lower calories, great taste)
- 0.0 beer a clear driver for profitable growth; top brewery groups have made major investments in marketing it
Accelerated growth for non-alcoholic beer globally

- 18% sales increase in past five years and forecast to climb another 12% by 2022

Euromonitor: Sales volumes of low and non-alcoholic beer up nearly 18% in the past five years in western Europe, and are forecast to climb another 12% by yearend 2022.
People choose 0.0 beer over alcoholic beer
What’s so good about 0.0 beer?

• Natural ingredients barley-malt-wheat
• Less than half the calories of conventional beer
• Full and rewarding social life
• Work and 0.0 beer integration
• Reduced short- and long-term healthcare costs
Great 0.0 beer
Non-alcoholic beer: Zero alcohol beer sells big
- How to achieve successful taste from unique dealcoholization technology?

Great taste from Alfa Laval Dealc technology
Great 0.0 beer taste from Alfa Laval Dealc

- No-distillation, no-dilution stripping column
- Continuous single-pass, low temperature vacuum processing with low residence time
- Possibility to recover and dose aroma before or after removing the alcohol
Why stripping is best
- A gentle, single-pass process with less than a minute of residence time

- Effectively removes ethanol from a liquid stream using a counter-current flow gas stream
- Always occurs in equilibrium at 80–110 mbar between 41–45°C under vacuum conditions
- Column provides huge contact area between the liquid and gas phases
- Column packing is very versatile for custom design and variable density and efficiency
- No boiling, just highly effective separation
Why distillation is not best
- Beer must be boiled for ethanol extraction

• A physical process where components in a mixed stream are divided by different boiling point
• Separates and concentrates certain components of a liquid mixture that have lower boiling points
• If temperatures exceed the boiling points, alcohol evaporates much more quickly than water does
• Cooling the resulting vapours then produces a high percentage of alcohol
• Longer residence time (at boiling temperature) required for efficient distillation and phase separation
Key dealcoholization processes

- Culinary steam generation
- Alcohol condensing
- Stripping to separate alcohol
- Aroma/volatile recovery
- Degassing
- Pre-heating with energy recovery
Great-tasting 0.0 beer from a single pass
- Gentle vacuum-based stripping

• From 5 to 100 hl/h standard capacities in Alfa Laval Dealc
  ABV reduction from 13% to <0.05%

• Efficient dealcoholization for all beers
  Lager/ale/wheat/IPAs/non-filtrated beers

• Optimized for great no-burn beer taste
  Dealcoholized beer profile close to the reference beer
Great-tasting 0.0 beer from a single pass

- Effective performance

• **Single pass, low thermal impact**
  Operating temperature < 45°C, 1 minute in column…

• **Full system cleanability**
  CIP/SIP of internal surfaces
Great-tasting 0.0 beer from a single pass

- Efficient operation

- Low steady-state running costs, low maintenance
  Less than €4/hl in utilities
  (2.8 to 3.8 €/hl depending on flow)

- Short start-up time
  Start-up to standby in less than 10 minutes
Dealcoholization

- Three applications in one unit

- Production of non-alcoholic (NAB<0.05% ABV) and low-alcoholic (LAB< 0.5% ABV) beers
- Partial removal of alcohol from full-strength, high-gravity beer
- Separation of neutral, decolourized food-grade alcohol for use in other applications
Aldox: Efficient stripping technology
• Proprietary know-how
• Stainless steel structured modular packing
• Stable performance

Brewery industry-leading reliability
• More than 1000 stripping systems is use worldwide
• Lowest total cost of ownership

Big capacity range and flexibility
• Capacities from 5 to 1600 hl/h DAW stripping
• Multiple applications in food & beverage industry
Non-alcoholic beer: Zero alcohol beer sells big

- Why consider your provider’s brewery know-how, technical support and extended solutions?

Global brewery know-how and support
Global brewery know-how for great 0.0 beer

- 0.0 process starts in brewhouse and how beer is fermented
- Beer pre-treatment and post-treatment support is required
- Dealcoholization is a complete solution, not just a component
The brewing process…
− Comprehensive solutions from Alfa Laval
Alfa Laval’s brewery offering…
- Cold block processes
Alfa Laval’s brewery offering…
- Filtering, treatment, utilities and packaging processes
... and competence know-how
- Unmatched brewery expertise

Separation
- HSS
  Beer separation and recovery
  Wort/beer clarification
- Decanter
  Dewatering
- Lowal
  Dealcoholizer

Thermal
- PHEs
- Coolers
  Yeast and beer cooling
- Dynapitch
  Yeast pitching
- Aeroset
  Wort aeration
- Carboset
  Carbonation
- Yeast plant
  Propagation
- Flexitherm and Thermolyzer
  Pasteurization and yeast autolysis
- Alfadose
  Additive dosing

Modules and filtration
- CIP station
  Cleaning-in-place
- Aldox
  Deaeration
- BSF
  Sterile filtration
- De-alcoholization

Fermentation
- Scandi Brew components
  Cleaning fermentation, dry hopping and infusions
- Rotary jet heads/mixers
  Cleaning fermentation, dry hopping and infusions
- Top tank systems
  Yeast and fermentation management

Flow
- Valves
- Pumps
  Valve clusters
  Yeast, wort, beer and utility routing

Projects
- Yeast systems
  Propagation and storage
- Process blocks
Alfa Laval Dealcoholization Module
for non-alcoholic and low-alcohol beer
Low- and no-alcohol beer integration projects

- Include Alfa Laval centrifuges, buffers, Carboblend, aroma dosing, cooling modules…
AlfaDose after Dealc for inline dosing
0.0 beer: Bring it on!

Huge demand for 0.0 beer

Great taste from Alfa Laval De-alc Module

Global brewery know-how and support
One final clear benefit…
- Responsibility and life saver

<0.05% ABV
Alfa Laval Brewery on social media

- #alfalavalbrewery