



Ion exchanger

Decolourisation and demineralisation of liquid sugar



Application

A decolourisation system removes colour from sugar using an ion exchange system after heating and pre-filtration. The dissolved sugar then returns to the plate heat exchanger for energy recovery.

Liquid sugar colour is normally measured using the International Commission for Uniform Methods of Sugar Analysis (ICUMSA) scale. Beverage producers typically require an ICUMSA rating of < 35.

A typical application is:

- Decolourising sugar solutions

Highlights

- Provides high profitability if raw sugar quality is low
- High process reliability and decolourisation efficiency
- Highly automated plant designed for long production runs
- Sweet water recovery

Working principle

If the sugar inlet colour is below 150 ICUMSA, floc potential is negative and ash content is below 500 ppm, the 75 °C dissolved sugar can be treated through an ion exchange system to meet a 35 ICUMSA outlet specification of the simple syrup. This system does not remove flocs or ash from the dissolved sugar solution.

The ion exchange system consists of a sand filter, an ion exchange column filled with strong basic-anionic resin, and a granulated carbon filter (for deodorisation purposes). Between each filter step is a safety bag filter unit.

The ion exchange column is commonly designed to work in continuous mode 24 hours/day, six days per week and for six hours for resin regeneration. The resins adsorb natural colourants from cane sugar and colourants formed during sugar processing. Regeneration is performed with 10 % sodium chloride solution (NaCl) in the ion exchange column in counterflow. The system includes an inline ICUMSA measurement to monitor the colour of the simple syrup after exiting the column. Any sweet water is led into a recovery tank and fed back into the process.

Technical data

Each ion exchanger is a complex unit with a bespoke design to meet each customer's specific requirements and raw sugar specifications.

The ion exchanger is also always designed to fit the customer's individual decolourisation room layout.

Electrical power	400 V, 50 Hz
	Other supply voltage or frequency available
Compressed air	Main panel
	600 kPa (6 bar)

Control panels

The ion exchanger unit is controlled by an Allen Bradley ControlLogix or Siemens PLC.

This can be fitted in a cabinet located nearby.

