Sugar Syrup Filtration

Sugar syrup, made from granulated raw sugar and water, is used in many food manufacturing applications, such as soft and energy drinks.

How Eaton's filtration solutions help to ensure the quality of sugar syrup in the food industry.

Fluctuations in availability and shifts in the supply chain for both raw sugar and finished sugar syrup significantly impact the relationship between product quality and price

Given these challenges, industrial users of sugar syrup, such as soft and energy drink manufacturers, are adapting their internal processes. To reduce reliance on raw sugar suppliers and ensure timely availability of their desired syrup quality, they are increasingly opting to produce their own sugar syrup using granulated raw sugar and water.

Sugar syrup is inherently prone to contamination by particles and microbiological agents such as bacteria, yeast, and mold, which is deemed unacceptable for all food and beverage products. Furthermore, suspended particles compromise the appearance of the end product and can result in undesirable tastes and off-flavors.

Consistent syrup quality and its reproducibility are crucial for the quality of the end product. As these requirements are heavily influenced by the production process, it is important to select the appropriate production methods and technologies to meet cGMP (current Good Manufacturing Practice) quality standards. An essential aspect of the production process is the use of filter media that strictly adhere to the quality guidelines outlined by the EU Food Regulation and the FDA (Food and Drug Association).

Consistent quality and uninterrupted availability of sugar syrup is paramount, especially in the production of products with high sugar demands, such as soft and energy drinks. To ensure both, producers implement treatment processes. Among these, particle separation using depth filtration stands out as a key method to mitigate qualitative fluctuations caused by variations in the origin or processing method of the raw sugar.

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Which Filtration Processes Help Produce First-Class Sugar Syrup?

Eaton recommends a single-stage process for removing microbiological agents and suspended solid particles from sugar syrup. The best results are achieved with an enclosed, fully-automated StepFlow® filtration system with BECO INTEGRA® DISC stacked disc cartridge housings for fine or microbial removal filtration. This allows the operator to have complete control over the filtration process and achieve consistent syrup quality, despite fluctuations in the raw material. The ideal filter medium is the backflushable and extra-robust BECODISC® R+ stacked disc cartridge with BECOPAD® depth filter sheets made of high-purity cellulose. Thanks to its design and high wet bursting strength, combined with a large filter surface area, it can achieve an extended service life of up to 20 backwash cycles.

If required, a second purification stage with the high-performance BECODISC® BC activated carbon stacked disc cartridges with activated carbon depth filter sheets from the BECO CARBON™ range can be installed downstream of the particle separation process. This step is particularly recommended for meeting higher quality requirements concerning color, odor and taste.

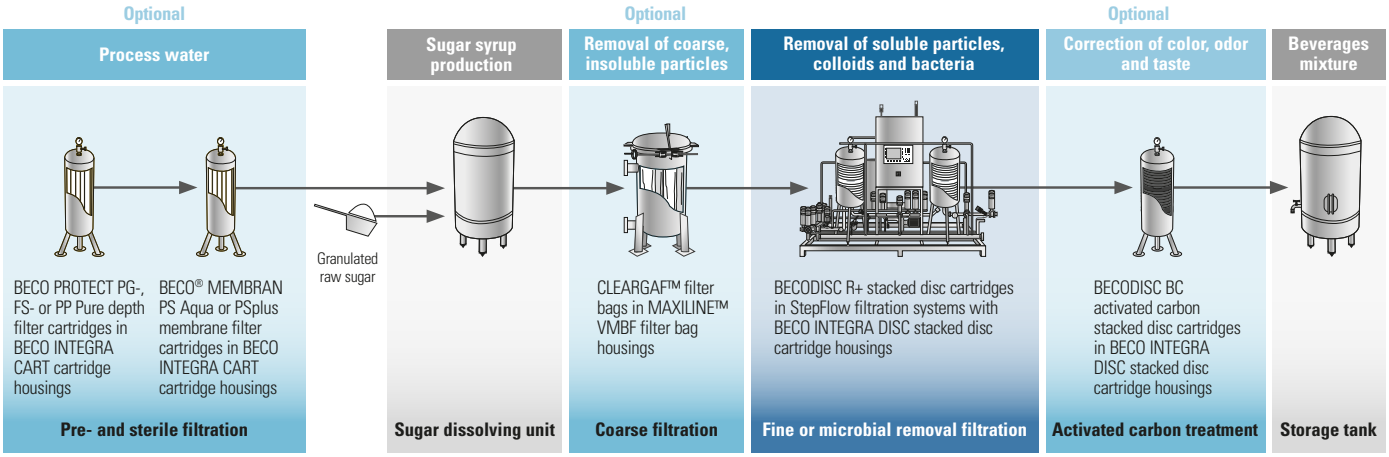
Additional recommendations:

- Prior to syrup production, the water for the sugar dissolving unit should be filtered via a two-stage cartridge filtration process to remove particles and microorganisms.
- If the sugar syrup contains coarse or insoluble particles, coarse filtration with filter bags can be used upstream of particle filtration.

Eaton solutions for sugar syrup filtration:

- BECOPAD filter media made of high-purity cellulose with high strength ensure safety at high process temperatures
- Special design of the backflushable BECODISC R+ stacked disc cartridges ensures process reliability and economical service life
- Fully automated inline filtration solution increases productivity and reduces filtration costs
- BECODISC BC stacked disc cartridges with immobilized activated carbon meet special requirements for color and odor correction
- FDA and EU food compliant filter media increase process and end product safety
- cGMP compliant classic and enclosed filter systems with CIP and SIP capability maximize process hygiene

Simplified Process Flow Diagram



* Eaton depth filter sheets meet national and international quality standards, such as European Directive (EU) 1935/2004 and FDA guidelines (Food and Drug Administration) from the USA. The plastic components of the stacked disc cartridges and filter cartridges (polypropylene) meet European Directive (EU) 10/2011.

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