



FOOD & BEVERAGE TREATMENT TECHNOLOGIES



A Global Leader in **Custom Food Processing**.

The food and beverage industry is a dynamic, global industry with an increasing demand for high-quality products. Every influencer in the industry has a tremendous responsibility to the customer with regard to food safety, nutrition, food tracking, plant security, and quality management protocol. With thirty years of experience using ion exchange resins, Fluence offers various processes for the treatment and enhancement of food and beverage products, such as grape must, whey, concentrate juices, and more.

Besides demineralizing or decolorizing juices, our processes can recover natural colors, flavors, and polyphenols from a variety of fruits and plant extracts.

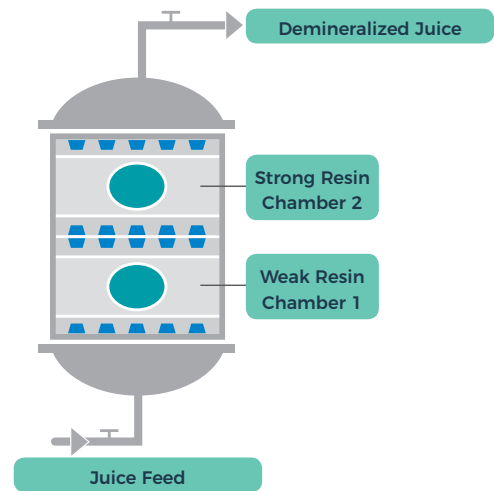
Technology	Description	Application
Demineralization	Complete removal of ions by ion exchange resins	Fruit juices (e.g., apples, grapes, etc.), milk whey
Recovery of Organic Acids	Recovery of organic acids (like malic and tartaric) in demineralization plants	Fruit juices (e.g., apples, grapes, oranges, lemons)
Decolorizing and Natural Color Recovery	Removal of anthocyanins and enocyanin by adsorbent resins and recovery of color	Fruit juice, vegetable juice (e.g., carrot), cane sugar
Tartaric Stabilization	Tartaric stabilization on strong cationic resins	Wine, grape must
Debitting	Removal of limonin by adsorbent resins	Lemon juice, orange juice
Demetallization	Removal of copper and iron by a special chelating resin	Fruit juice
4SMB Chromatography	Chromatographic separation by Four Simulated Moving Bed (4SMB) system	Concentrated fruit juice, concentrated demineralized grape/apple juice, concentrated lactose solution

Demineralization and Recovery of Organic Acids

Our solution is based on the counter-current flow process through a floating bed system with counter-current regeneration.

Advantages of Our Solution:

- Low dilution of demineralized juice
- Long production cycle with maximum product recovery
- High performance with maximum use of resin exchange capacity
- Recovery of organic acid in grape must without demineralization costs



Decolorizing and Natural Color Recovery

Our process is based on the removal of polyphenols by an adsorbent resin regenerated in the counter-current flow process. The colored substances can be recovered to produce a natural color solution.

Advantages of Our Technology:

- Low regenerate consumption due to counter-current regeneration
- No supply and disposal cost for active carbon
- High absorption capacity due to high bed depth and quality of the resins used
- Energy savings due to reduction of organic load to Wastewater Treatment Plant (WWTP)
- Equipment is Atmosphere Explosion (ATEX) certified in case treatment requires regeneration with alcohol

Tartaric Stabilization

Our process is based on removal of potassium (decaionization) from wine by a strong cationic resin regenerated with acid (hydrochloric or sulphuric).

Advantages of Our Technology:

- No tartaric acid addition is required
- Low electrical energy consumption
- No dilution of wine

Debittering

The debittering of fresh orange and lemon juice consists of removal of the naringin and/or limonin that are responsible for the bitter taste of some types of citrus fruits. The process is performed by an absorbent resin.

Demetallization

The demetallization process allows for the removal of iron and copper tracks in grape must or fruit juice.

The process uses a special chelating resin regenerated with hydrochloric/sulfuric acid that is not consumed by the process, so it can be reused, for example, in a demineralization plant.

4SMB Chromatographic Separation

4SMB chromatography can be used for the demineralization of fruit concentrates (such as grape and apple), the demineralization of whey, and the separation of sugars (such as glucose and fructose) from the Demineralized Concentrated Must (DCM) or concentrated apple juice.

The main advantage of this technique is the absence of chemical reagents, like acid and soda, because, unlike the traditional demineralization lines, the particular resins used are not regenerated. Another great advantage of 4SMB chromatography is the reduction of the saline and contaminating load in the wastewater. Recent international regulations favor "Green Chemistry," which supports the chromatography technology as the best technique available to obtain organic certification for fruit juices and/or sugars.