JUICE, NECTAR AND STILL DRINKS

Typical end products
Fruit and vegetable juice concentrate from apple, orange, grapefruit, pineapple, tomato, passion fruit, mango, carrot, grape, cherry, cranberry, guava, pomegranate, etc.

Chemical curve: R.I. per BRIX at Ref. Temp. of 20°C

Introduction

Juice is obtained by mechanically squeezing fresh fruits or vegetables. The extracted juice has 100% fruit content and can be used for the preparation of drinks such as nectars and still drinks (non-carbonated).

The juice is mixed with water, sugar and other ingredients to a certain concentration. Nectars have a juice content of 25-99%. Still drinks have a concentration of 0-24%, which can come from fruit, vegetable or flavors.

Application

Nectars and other still drinks are often prepared by in-line blending of juice.

In this process, water and juice concentrates enter the system from balance tanks. The concentrate is fed into the water stream to form a pre-blended juice. The ratio of the two streams is controlled by flow meters and a process controller. Precise dosing of the juice ingredients is essential for achieving the desired concentration and ensuring a consistent product quality.

The concentration is adjusted by adding small quantities of water via a separate line to achieve a pre-set Brix value.

The juice passes through a static mixer before it moves on to further processing and packing.

A highly automated process is essential for achieving precise in-line juice blending. Instabilities in the juice concentrate and water flows, and variations in tank contents and pumping rates, lead to fluctuations in the concentrate/water ratio. These fluctuations are difficult to control when using traditional blending methods.

Instrumentation and installation

The K-Patents Sanitary Process Refractometer PR-43-A is installed immediately after the static mixer to measure continuously the final Brix concentration of the product. The refractometer output signal is connected to the controller to provide the required information to adjust the ingredients dose. If the Brix value after blending is below the pre-set value, the controller opens the concentrate feed valve to increase the Brix content. Similarly, the controller can...
command the addition of water if the concentration of the product exceeds the desired value. The typical measurement range is 10-15 Brix at a temperature of 10-20°C (50-68°F).

The K-Patents Sanitary Process Refractometer is designed to meet the highest standards for safe food processing. Moreover, the refractometer's measurement is not influenced by fruit pulp, color, fibers, solid particles or air bubbles.

In-line blending control with the K-Patents refractometer eliminates the need for reblanding or penalties due to a too low Brix level. The refractometer’s accurate concentration measurement also minimizes concentrate loss and ensures a consistent product quality.

<table>
<thead>
<tr>
<th>Instrumentation</th>
<th>Description</th>
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<tbody>
<tr>
<td>Instrumentation</td>
<td>K-Patents Sanitary Compact Refractometer PR-43-AC for hygienic installations in small pipe line sizes of 2.5 inch and smaller. The PR-43-AC refractometer is installed in the pipe bend. It is angle mounted on the outer corner of the pipe bend directly, or by a flow cell using a 3A Sanitary clamp, I-clamp or Varineline® connection.</td>
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<tr>
<td>User Interface</td>
<td>Selectable multichannel MI, compact CI or a web-based WI user interface options allow the user to select the most preferred way to access and use the refractometer measurement and diagnostics data.</td>
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<tr>
<td>Measurement range</td>
<td>Refractive Index (nD) 1.3200 – 1.5300, corresponding to 0-100 Brix.</td>
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