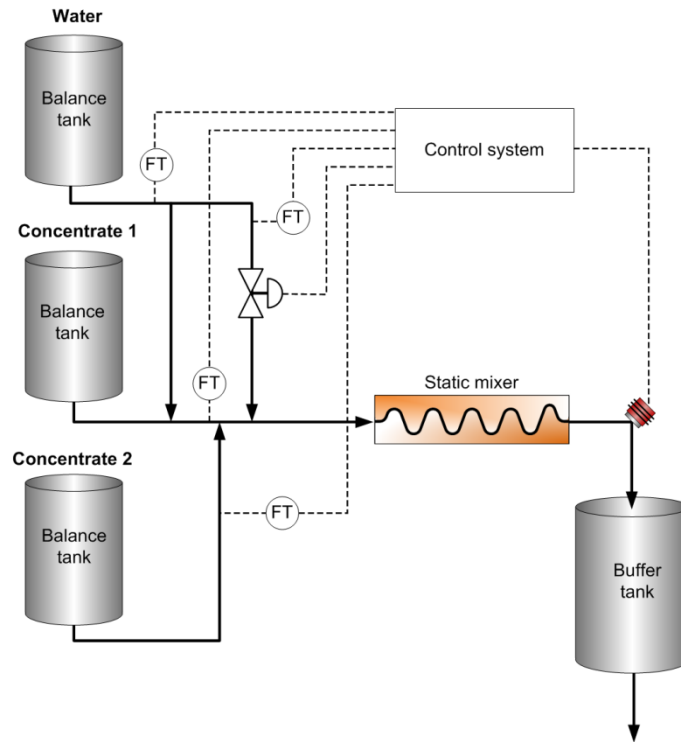


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| BEVERAGE | |
| APPLICATION NOTE | 2.04.02 |
| IN-LINE BLENDING OF JUICE | |

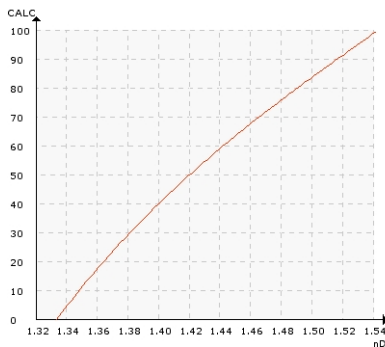


JUICE, NECTAR AND STILL DRINKS

Typical end products

Fruit and vegetable juice concentrate (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 prepared through mechanical squeezing of fresh fruits or vegetables. Juice always has 100 % fruit content. Nectar is also made from fruit or vegetables but with added sugar and it may have a juice content of 25-99 %. Still drinks have a juice content of 0-24 %, which can come from fruit, vegetable or other flavourings.

A highly automated process is essential for achieving precise in-line juice blending. This is necessary

because instabilities in the juice concentrate and water flows, caused by 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.

Application

Water and juice concentrate enter the system via balance tanks. The concentrate is then fed into the water stream to form pre-blended juice. The ratio of the two streams is controlled by flow meters and a process controller. Immediately after this, final blending to a pre-set Brix value is achieved by adding a small amount of water by way of a separate line. Then, the juice is passed through a static mixer, located just prior to the K-Patents Sanitary Process Refractometer PR-23-AC.


Installation

The K-Patents Refractometer PR-23-AC is installed immediately after the static mixer. It is angle mounted on the outer radius of a pipe bend, either directly or through a flow cell, a Sanitary clamp or a Varivent® connection. The typical measurement range is 10-15 Brix at a temperature of 10-20°C (50-68°F).

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With the K-Patents PR-23-AC, a highly accurate concentration measurement can be achieved. Thus, re-blending or penalties due to lower than specified Brix levels are avoided and loss of concentrate due to an overly high Brix level is minimized.

Fruit pulp, fibers, solid particles or air bubbles have no effect on the measurement accuracy.

| Instrumentation | Description |
|---|---|
|  | <p>K-Patents Sanitary Compact Refractometer PR-23-AC for small pipe line sizes of 2.5 inch and smaller.</p> <p>The PR-23-AC sensor 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 or Varivent® connection.</p> |
| Measurement range: | Refractive Index (nD) 1.3200 – 1.5300, corresponding to 0-100 Brix. |