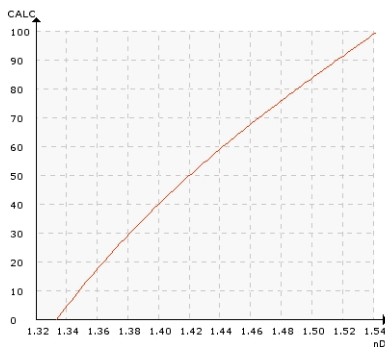


## BEET SUGAR

### Typical end products

Soft drinks, beer brewing, pastries, preserves, sausages, beverages, sweets, confectionery, ice-cream, liqueurs, beverages, pharmaceuticals, etc.

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



### Introduction

After the beets are thoroughly washed, they are passed through the slicers, where they are cut into long, thin strips or cossettes. The cossettes, upon entering the continuous diffuser, are elevated by means of a perforated flight scroll or a similar device. Counter-current water is introduced at the upper end of the diffuser. The diffuser is steam-heated by means of external jackets. The extracted sugar leaves the diffuser at a concentration of 10 to 15%

Brix, which accounts for about 98% extraction of the beets.

### Application

Control of the whole extraction process is complex. Precise real-time data from different areas of the diffuser tower is required. The K-Patents Process Refractometer provides fast detection of process disturbances. Accurate control of the concentration levels saves energy by minimizing the amount of water, which has to be evaporated later in the process. The K-Patents Process Refractometer allows precision control of the extraction process.




### Installation

The refractometer is installed in the press water line, where it measures the sugar concentration of the water separated from the pulp. Because this water is recycled to the upper part of the diffuser, it is important to obtain accurate concentration readings. The typical range is 0-5 Brix and the temperature is 60°C (140°F). The pipe diameter should be reduced just before the sensor head, so that a flow rate of 1.5 m/s (5 feet/s) will be achieved. In this part of the process, it is recommended that an automatic prism cleaning with steam is installed.

The refractometer at the midpoint of the extraction tower measures the Brix of the liquid, so that the fluctuation of the sugar content of the cassettes removed from the tower can be detected at the earliest possible stage. Then, by regulating the flow of raw juice, optimum efficiency can be achieved by reducing energy costs and sugar loss.

Concentration measurement from the diffuser tower outlet also provides data, valuable for balancing the

process. The sensor should be installed after a stone trap. Because of the impurities present in raw juice, prism cleaning with steam is recommended. The described measurements give a significant improvement in extraction control. The optimum compromise between juice flow and water evaporation can be achieved, and manual sampling can be avoided.

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>
	<p>K-Patents Sanitary Probe Refractometer PR-23-AP for installations in large pipes, tanks, cookers, crystallizers and kettles, and for higher temperatures up to 150 °C (300 °F). Installation through a 3A Sanitary clamp.</p>
	<p>K-Patents Process Refractometer PR-23-GP is an industrial refractometer for large pipe sizes and tanks, cookers, crystallizers and kettles. Installation through a flange or clamp connection.</p>
<p>Measurement range:</p>	<p>Refractive Index (nD) 1.3200 – 1.5300, corresponding to 0-100 Brix.</p>