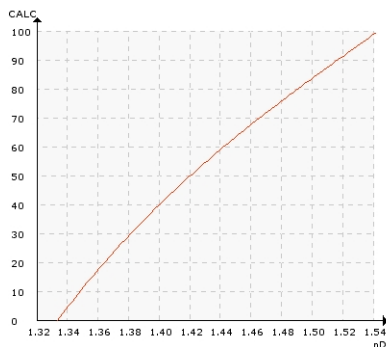


## BEET SUGAR

### Typical end products

Animal food, food additives, chelating agent, rum, industrial ethanol, alternative fuels, yeast, organic chemicals, etc.

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



### Introduction

Molasses is a viscous by-product of the beet sugar process. The syrup left from the final crystallization stage is called molasses and intermediate syrup is referred to as *green syrup*. It is recycled within the crystallization plant to maximize extraction.

### Green Syrup Control to Quantin

A method occasionally used in Europe is the Quantin process, in which the potassium and sodium in beet juice are replaced by magnesium through ion-exchange. This allows a higher proportion of sucrose to be crystallized but obviously produces molasses with lower sugar content (about 5% less),

<b>SUGAR AND SWEETENERS</b>	
<b>APPLICATION NOTE</b>	<b>1.01.05</b>
<b>BEET SUGAR GREEN SYRUP AND MOLASSES</b>	

increased magnesium level, and reduced potassium and sodium levels.

Quentin is an ion-exchange column. Alkaline ions (potassium/sodium) are exchanged with magnesium to reduce the solubility of sugar in water. The green syrup from the Quentin goes to the C-pan.

The K-Patents Process Refractometers are used to control the feed to the columns, giving a constant load, which results in the ion-exchange resins functioning longer. Typical range is 60 to 80 Brix and typical temperature 85°C (185°F). A minimum flow velocity of 1.5 m/s (5 feet/s) is recommended.




### Molasses Concentration Control

The K-Patents Process Refractometers are used to check that the concentration is above the lowest limit specified by the buyer. It can also be used for dilution control to avoid uneconomically high concentrations.

Typical concentration range is 70-85 Brix and typical process temperature is 80°C (176°F).

### Instrumentation and Installation

The Process Refractometer PR-23 functions perfectly in the evaporator control role. The dual connectivity of two sensors with one transmitter reduces the investment.

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