**RUM**

**Typical end products**
Rum.

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

---

**Introduction**

Rum is a distilled spirit made by fermenting and distilling sugar cane by-products, such as molasses and sugar cane juice. The distillate, a clear liquid, is usually aged in oak barrels or in similar containers until it becomes mellow and palatable.

**Application**

**Clarification of Molasses**

The first step in rum manufacture is the conversion of the molasses to alcohol, and the many other components produced in fermentation which give the rum its distinctive flavor. Before this, however, molasses must be pre-treated.

Molasses is diluted with water and *dunder* (waste from the wash column) and the mixture is heated. A flocculant is added to help unwanted inorganic impurities settle as sludge in a clarifying tank. Clarification of the molasses prevents scaling which is harmful for the still, distillation efficiency and product quality.

The clarified molasses is sterilized in a heating process to ensure minimum bacterial growth during fermentation.

The last pretreatment stage is the addition of water. This lowers the viscosity and sugar content of the molasses to a concentration at which fermentation can take place.

**Fermentation**

A yeast solution is added and mixed to the molasses in the fermentation tanks. Enzymes from the yeast convert the sugar into ethanol and carbon dioxide in nearly equal proportions. Initially the solution contains about 16-18 % sucrose. The alcohol content at the end of fermentation is about 6.5-9 %.

Once fermentation is completed, the tanks are allowed to rest to settle the dead yeast and other solids as mud. The fermented mixture is known as *the wash*. 

---

Food and Beverage | Alcohol Distillation
Stillhouse

The fermented mixture is pumped to the top of tall wash columns, which are special steam-heated distillation columns. Alcohol vapour is distilled out and removed at the top at about 50 % by volume.

The condensed alcohol mixture is diluted with water in the low wine charger tank and fed to pot stills in batches. The pot stills are like large kettles where the liquid is heated. The fractions, from the start and the end of the batch distillation process, are rejected to waste streams for reprocessing. The strenght of the raw rum produced is of about 78 % alcohol.

Modern distilleries use continuous distillation for separation of the fermenting juice. This increases productivity in order to meet the increasing demand.

Maturation Vats

From the raw rum receiver, the water-clear liquid is transferred to maturing vats, where it gradually converts from raw alcohol to smooth rum. During maturing, the color is adjusted by carefully adding controlled amounts of special alcohol caramel. After maturing, the rum is diluted from storage strength to different bottling strengths.

Instrumentation and installation


<table>
<thead>
<tr>
<th>Instrumentation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-Patents Sanitary Compact Refractometer PR-43-AC</td>
<td>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 Varinline® connection.</td>
</tr>
<tr>
<td>K-Patents Sanitary Probe Refractometer PR-43-AP</td>
<td>for hygienic installations in large pipes, tanks, cookers, crystallizers and kettles and for higher temperatures up to 150°C (300 °F). The PR-43-AP refractometer is installed in the pipe line or vessel through a 2.5 inch or 4 inch Sanitary clamp, I-clamp, APV Tank bottom flange or Varinline® connection.</td>
</tr>
</tbody>
</table>

User Interface

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.

Measurement range

Refractive Index (nD) 1.3200 – 1.5300, corresponding to 0-100 Brix.