**TOMATO CONCENTRATE**

**Typical end products**
- Tomato concentrate
- Tomato paste
- Tomato puree

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

**Introduction**

It is vital that the tomato concentrate processing line operates constantly at a full capacity. It is not possible to work at reduced capacity, intermittently or every other day. Every time the tomato processing line is shut down, all the machinery must be cleaned. This involves several working hours, the consumption of a great amount of water and wastage of the product contained in the evaporator.

Furthermore, fresh and ripe tomatoes cannot be held in storage for processing at ambient temperatures over 30 °C (86 °F) for more than 24-48 hours. This will result in an inferior, low quality final product with a low Brix level.

The entire production cycle is carried out according to extremely stringent sanitary and hygiene standards.

**Application**

Tomato juice concentration involves the reduction of the water content, leaving all the original solids as a concentrated solution.

Typically, single or multiple-stage (also called effect) evaporation plants are used for the tomato concentrate production. The juice inside the evaporator flows through different stages, where its concentration level will gradually increase until the required density is obtained at the final stage. Here, the tomato paste is automatically extracted via a pump controlled by the Process Refractometer.

**Instrumentation and installation**

Vaisala K-PATENTS® Sanitary Refractometer PR-43-AC provides continuous concentration information to optimize the evaporators performance while reducing energy consumption.

The refractometer is installed on the evaporator outlet. The signal from the refractometer adjusts the evaporator inlet flow or the steam flow to regulate the final Brix value. Typical measurement range is 5-35 Brix and typical process temperature about 95 °C (203 °F).

The refractometer is also used for tomato pulp standardization control. Typical measurement range is 4-7 Brix and typical process temperature about 20 °C (68 °F).
<table>
<thead>
<tr>
<th>Instrumentation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>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 Varinline® connection.</td>
<td></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. |