YEAST EXTRACT SOLUTION

Introduction

Yeast extract is a processed product, which comprises the soluble components of yeast cells.

Yeast extract is used in a broad range of applications. In the food industry, it is used as food flavoring, e.g. in soups, sauces and ready meals. Yeast extract is also used as an additive, vitamin supplement, as well as nutritional source for bacterial culture media.

Application

Yeast extract is prepared from baker’s or brewer’s yeast by extracting the cell contents. The process starts with the selection of the right yeast strain that meets the customer’s needs. The strain is cultivated in progressively larger vessels until it reaches the capacity of the production fermentators. During cultivation, air and a sugar source, for example molasses, is added to nourish the yeast. The fermentation allows yeast to grow in an aerobic environment and at a controlled temperature (around 30 °C or 86 °F). After fermentation, the residual sugar is removed and the yeast is washed and concentrated. The product from fermentation, known as the yeast cream, undergoes a heat treatment at a moderate temperature that allows opening the cells while conserving the enzymes.

The next step is autolysis. Autolysis is the process by which a cell will consume itself by using the enzymes contained within the same cell. This step of the process is performed under mild pH and temperature. Its duration depends on the type of yeast and the extent the proteins must be broken down. Autolysis involves the freeing of enzymes within the yeasts to break down the proteins.

After autolysis, the insoluble part in the solution, such as yeast cell walls, is separated from the water-soluble components. Separation is done by filtration. The water-soluble part will constitute the yeast extract.

Before proceeding to packaging or spray drying, the yeast extract must be concentrated and pasteurized. In this step, water is removed from the solution to achieve a desired concentration. The final concentration must be measured continuously to ensure a high-quality product and optimal operation of the downstream equipment. The concentration for a liquid product must be 50-65 % dry solids, and for a paste yeast 70-80 % dry solids. The yeast extract...
can be dried to a fine powder or granulated particles by spray drying.

The final yeast extract is then packed.

**Instrumentation and installation**

The K-Patents Sanitary Refractometer PR-43-A allows yeast extract plants to continuously monitor different stages of their process. The refractometer can be used at the initial step to control dilution of molasses and to monitor that the sugar source for cell cultivation is at the correct Brix level. This ensures that enough nutrients are supplied for cell growth and enhances the yeast cultivation process.

At the concentration step, the K-Patents refractometer is mounted directly on the pipe bend after the concentrator or pasteurizer. The refractometer measures in-line the concentration of the yeast extract to ensure the target dry solids level is achieved. In addition, a refractometer can be installed before the evaporator or concentrator. The refractometers’ output signals can then be used not only for quality control, but also to optimize energy consumption.

Typical temperature in this application is 30-60 °C (86-140 °F), and the measurement range is 0-100 Brix. Automatic prism wash might be required in this application.

The K-Patents PR-43-A is designed to meet the highest hygiene requirements. The refractometer is available with 3-A and EHEDG certifications.

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<th>Instrumentation Description</th>
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<td>K-Patents 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>
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<tr>
<td>K-Patents Sanitary Probe Refractometer PR-43-AP 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>
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**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.

**Prism wash systems**

Prism wash system components are a refractometer with integral wash nozzle mounted at the refractometer probe or in a flow cell, wash supply line components and a Multi user interface MI with relay module for prism wash diagnostics and control. Alternative wash media can be used for wash, e.g. steam, high-pressure water and warm water (hot condensate).

**Measurement range**

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