

Process Controls SalesNet

pH Applications

Non-glass Durafet Electrode Advances pH Measurement in Mayonnaise, Salad Dressing, Tomato Sauce Production

Background

Preservation of many foods is greatly assisted by low pH. Acid foods have an inherent acidity that provides a natural pH of 4.6 or lower. Acidified foods obtain the same benefit by the addition of food-grade acids or acid foods.

Control of the food pH to 4.6 or below, with appropriate heat treatment, will effectively prevent growth of bacteria that could cause spoilage or public health concerns. In addition, the acidity of many foods is an important contributor to their flavor.

Mayonnaise is an emulsion of vegetable oil, egg yolk, acid, emulsifiers, thickening agents and salt. Many salad dressings also include cooked starches and additional spices. The egg yolk protein forms a viscous film around the oil droplets that protects the emulsion from separation.

Depending on the final product, ingredients may be premixed in a number of ways but are eventually metered into a colloid mill for thorough blending that produces a more stable emulsion. pH measurement provides assurance that the final blend still satisfies acidity requirements.

Tomatoes are inherently acidic; however, this acidity can vary significantly with the variety of tomato, fertilizers used and weather during the growing season. When combined with a variety of other ingredients that have their own effects on acidity, it becomes essential to monitor the pH of tomato-based food products, such as catsup, sauces and salsa.

pH electrode requirements

pH electrodes must meet sanitary requirements for direct contact with food. The non-glass, Durafet® electrode is a major breakthrough for

pH measurement in this type of application. Based on new Ion-sensitive Field Effect Transistor (ISFET) technology, it eliminates the fragile glass membrane and the associated risk of breakage and liabilities of glass contamination of product and costly downtime.

The Sanitary Durafet electrode design complies with 3-A sanitary standards and is authorized to display the 3-A symbol.

In addition, Durafet electrode response eliminates the high

impedance circuitry and vulnerability to insulation breakdown of glass membrane electrode signals. They have no oxidation-reduction potential (ORP) interference and negligible sodium ion error at high pH. They have exceptionally fast pH response—typically within 1 second. This assures close monitoring and control.

Long life of the solid-state pH sensor is complemented by a reference electrode section with a large volume of gel electrolyte. The flush reference junction resists clogging and eases cleaning. No pressurization of the reference electrode is required. The probe also includes a temperature compensator to provide a compensated pH signal compatible with a variety of instrumentation.

Durafet electrodes can be used with the full line of Honeywell pH analyzers and two-wire transmitters. In addition, adapter modules are available to electronically interface the Durafet electrode to most other types of analyzers.

Simple solution

Tomorrow's standards that Honeywell is setting today with the Durafet pH electrode include:

- The solid-state ISFET sensor is virtually unbreakable.
- Response has no sodium ion error nor ORP interference.
- Flush reference junction and gel electrolyte reduce maintenance costs and increase electrode life.
- The built-in counter electrode improves measurement stability.
- The electrode easily retrofits to existing systems with sanitary flange and choice of insertion depth.

The sanitary Durafet pH electrode is another example of powerful Honeywell technology, giving you a simple solution that increases productivity, saves time and increases process profitability.

Recommended equipment:

- 7794 Sanitary Durafet pH electrode mounting
- 9782 pH Analyzer/Controller

[\[Return to Top\]](#) [\[Return to Applications Homepage\]](#)