

INDUSTRY: DAIRY - CREAM CHEESE PRODUCTION

PRODUCT: LIQUID PRE MIX OF WHEY, WATER, AND CREAM CHEESE SOLIDS

APPLICATION: Measure the % Total Solids of a Liquid Pre Mix.

This is a Continuous Process with our System being used for Closed Loop Control and Visual Monitoring.

DESCRIPTION: The Cheese Making Process requires that each Customer make a Liquid Solution of Whey, Water, and Cheese Solids. This Liquid Pre-Mix is sent to a Separator where some of the Whey and Water is removed to make the Final Cream Cheese Product.

The customer would like to measure and control the Total Solids Content of this Pre Mix Liquid.

BENEFITS:

COST SAVINGS By controlling the Total Solids Content of the Pre Mix, the Customer can save Money by producing a product, which has a lower Solids Content, but is still in Spec. Another way of selling more water.

The Pre Mix which is produced using an HK System for Control, has a much lower variability than if it was produced without Closed Loop Control.

This lower variability allows for better control of the Final Separator and an improvement in Production Efficiencies.

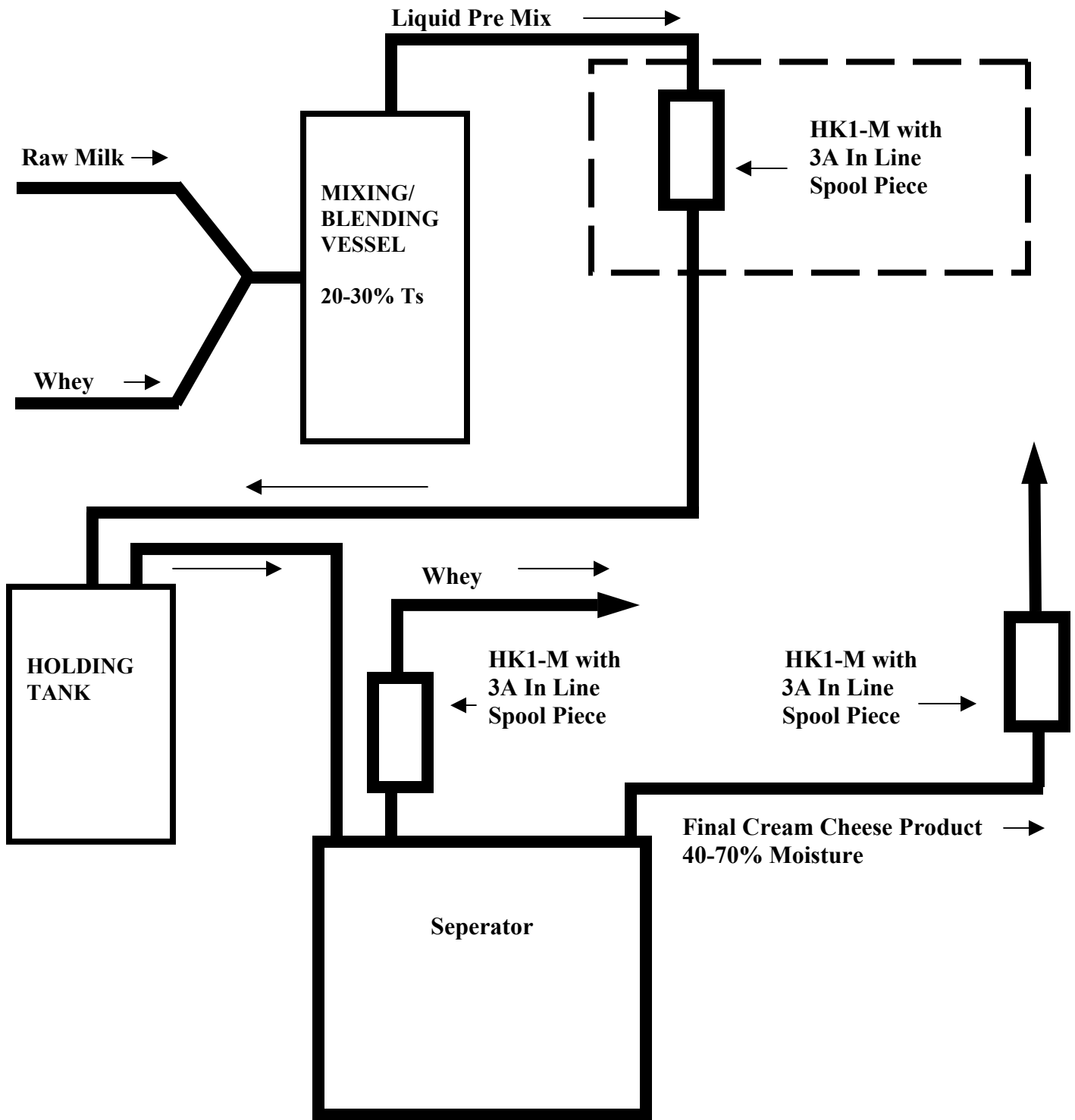
QUALITY By using the HK Microwave System to Control the Pre Mix Liquid, the Quality of the Final Product is improved because the Variability of the Pre Mix has been reduced. This reduces the Variability of the Final Product.

REPEATABILITY +/- 0.2 % is possible with a very good Calibration Curve.

MEASURING RANGE 40% to 75% Moisture Content or the Equivalent 25% to 60% Total Solids Content is Typical.

The system can Measure as low as 1.0% TS and as high as they can pump the product.

HK EQUIPMENT: HK1-M IN LINE WITH 3A SPOOL PIECE



CREAM CHEESE PRODUCTION 1-29-07

HK INSTRUMENT SYSTEMS

Pittsburgh, PA

CREAM CHEESE PRODUCTION

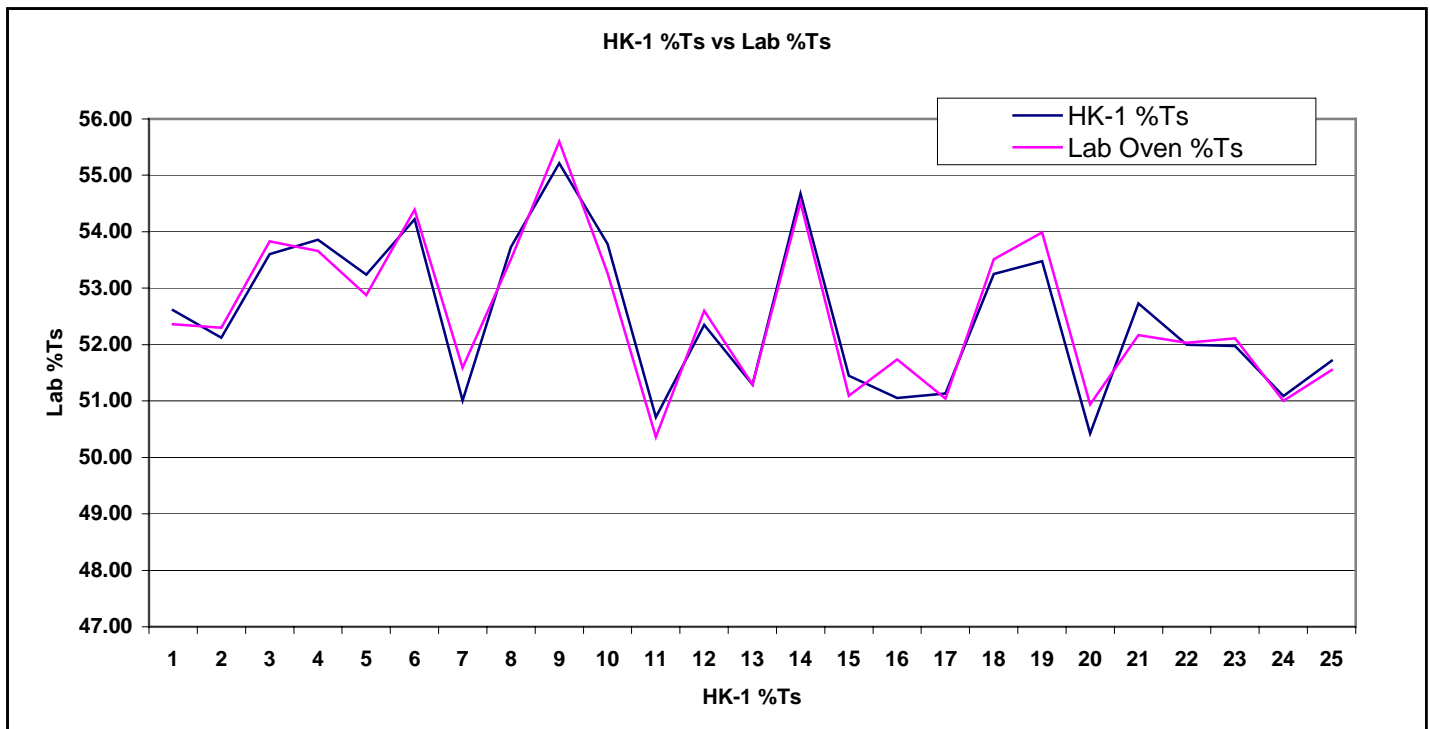
APPLICATION: TO MEASURE THE %TOTAL SOLIDS OF A CREAM CHEESE PRODUCT DURING PRODUCTION. LOW OR HIGH FAT, LOW OR HIGH MOISTURE POSSIBLE.

INSTALLATION: THE MICROWAVE SENSORS ARE ALWAYS INSTALLED WITH A **PROPRITARY 3A SANITARY SPOOL PIECE** WHICH WILL BE MOUNTED VERTICALLY. TEMPERATURE COMPENSATION WILL ALWAYS BE INSTALLED.

TESTING: AN EXAMPLE OF A CREAM CHEESE PRODUCT IS DESCRIBED BELOW. SAMPLES WERE COLLECTED AND DRIED IN A LAB OVEN TO DETERMINE % TOTAL SOLIDS BY LOSS OF WEIGHT. READINGS OF THE HK-1 MICROWAVE INSTRUMENT SYSTEM WERE RECORDED EACH TIME A SAMPLE WAS COLLECTED.

RESULTS: CORRELATION BETWEEN LAB SAMPLES AND MICROWAVE READINGS IS EXCELLENT FOR THE ENTIRE MEASUREMENT RANGE. THE R-SQUARED VALUE IS 0.93.

LAB OVEN VS MICROWAVE



SAMPLE NUMBER

CONCLUSIONS: THE HK-1 MICROWAVE INSTRUMENT SYSTEM IS AN EXCELLENT TOOL THAT CAN BE USED TO MONITOR AND CONTROL THE %TOTAL SOLIDS OF ANY CREAM CHEESE PRODUCT.