



STOCK's Oscillating Motion Steam-water-spray Sterilizers

STOCK America is pleased to introduce a new line of Oscillating Motion Sterilizers to the Food Industry. The retorts are manufactured by SURDRY Sterilization Systems and are offered in both 1400 and 1700 millimeter diameters with up to six cube positions. Our vision was to provide the industry with an optimized technology that utilizes intermittent oscillation, a new concept in sterilization, to overcome viscosity by controlling the deflection angle and dwell time of the product. The ability to influence these variables provides full control over heat transfer to the product and more uniformed heating which results in decreased process times, exceptional product quality, and increased capacity. By combining oscillating technology with our award winning ICON sterilization management system, STOCK America is able to provide a controllable, predictable, and repeatable thermal process optimization saving our customers both time and money.

Prior to agitation technology, the thermal processing industry used static retorts for sterilization. Because the product remained motionless, heat penetration was unreliable resulting in inconsistent product quality and, very often, product burn. Agitation was introduced so that, like stirring a pot on the stove, the product can be heated homogenously to avoid overcooking, or burn, and yielding a higher quality product.

Agitation has gone through its own evolution with two methods, linear horizontal motion and continuous oscillation, becoming industry norms. The linear horizontal motion method moves the product from side to side using the energy from accelerating and stopping to create agitation, like a car punching the gas and then slamming on its breaks. However, the energy required to produce effective agitation compromises the integrity of the product, both contents and packaging, and it also reduces the life of the machine. Continuous oscillation, Surdry's previous method, rocks the product back and forth much like the pendulum of a clock. The swinging motion generates less stress on the product and the sterilizer, but lacks predictability through changing product viscosities.



STOCK America has taken the process a step further. By creating a dwell time for the product at an established angle, intermittent oscillation uses gravity and package headspace to provide agitation for high viscosity products. STOCK's award winning ICONSMS control systems have the ability to quantify heat penetration, calculate changes in viscosity, and adjust both the angle and the dwell time to identify the optimal process for any viscosity and particulate profile. The efficiency of the machine coupled with the guidance of STOCK's innovative software results in a thermal process second to none.

Faribault Foods has researched this technology at the Cryovac Retort Lab at in the Department of Food, Nutrition and Packaging Sciences at Clemson University, which features Surdry's AO-142 sterilizer with intermittent oscillation and extended dwell time. The research team, headed by Dr. Scott Whiteside, was able to explore and analyze recipe variables for numerous products including baked beans, red and white meat chilies, and macaroni and cheese.

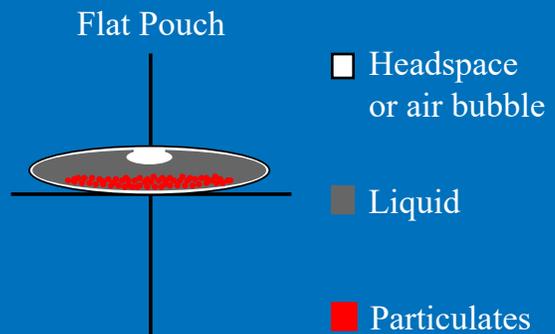
“Although skeptical at first as to the effectiveness of adding dwell time to continuous oscillation to improve heat transfer, thinking that more oscillations would be better and adding dwell time would reduce the total number of oscillations, there was no doubt adding dwell time showed improved heat transfer on some products. The beauty of the system is that it relies on basic gravity to move the “bubble” in the pouch through the product and by adjusting the dwell gives the “bubble” time to pass through the product which promotes mixing. The other advantage to the system is that it is entirely adjustable and can be set to operate in the traditional continuous oscillation mode if that is best for the product. Having this feature will no doubt allow for optimization of the thermal process in oscillating type retorts.”

Jim Nelson,
Executive VP of R&D
Faribault Foods



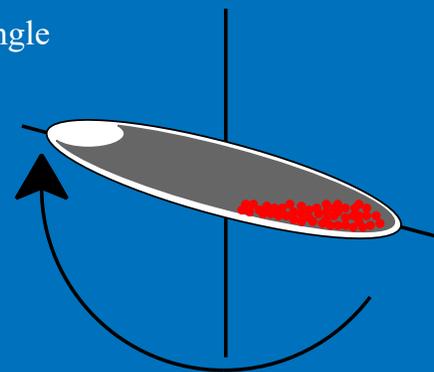
Intermittent Oscillation

Oscillation rocks the product back and forth much like the pendulum of a clock. The swinging motion generates less stress on the product and the sterilizer.

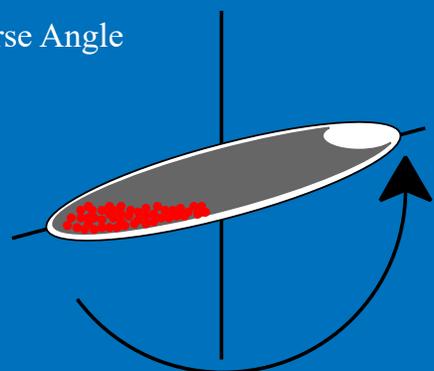


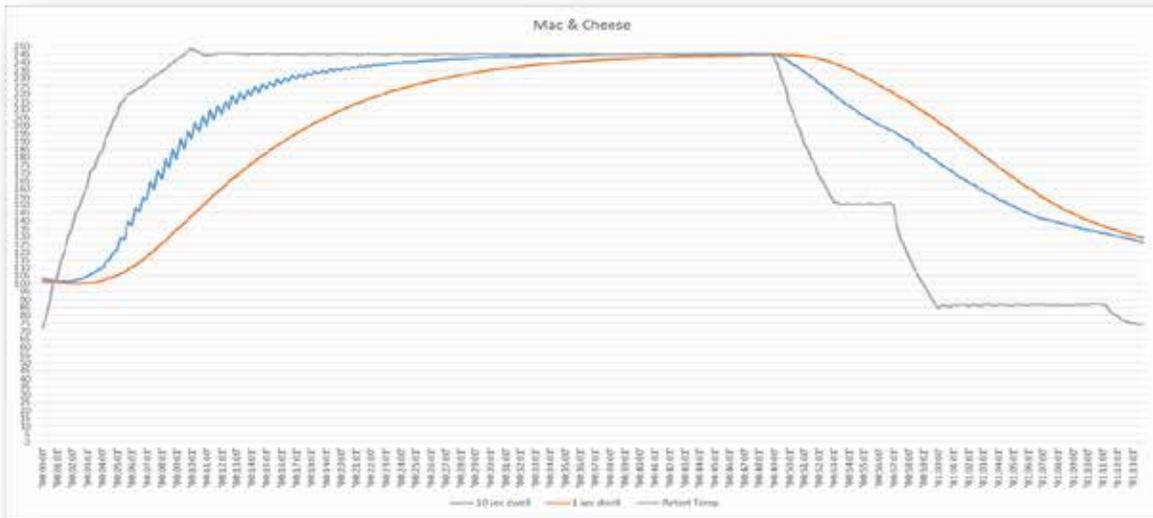
By creating a dwell time for the product at an established angle, intermittent oscillation uses gravity and package headspace to provide agitation for high viscosity products.

At Angle



Reverse Angle





Graph 1. Temperature (°F) versus time for retort, 30 second oscillating dwell time and 1 second dwell time for mac and cheese product.

Utilizing STOCK’s ICONSMS control system, the team was able to pinpoint the optimum process for various product viscosities. Dr. Whiteside notes that “based on our work here at Clemson University, we have recognized two primary benefits of extending the oscillating dwell time of the Sundry Retort system. They are quicker heating of certain high viscosity products and greater product formulation flexibility. We have observed that various food products that typically would not respond well to the traditional oscillating motion often exhibit faster heating due to the ability of the Sundry retort system to extend the holding dwell time beyond 1 second. This allows sufficient time for certain high viscosity food products to move in the container and therefore providing more even and often quicker heating. In addition, the extended dwell time gives product formulators more flexibility to produce a broader variety of shelf stable food products than with just traditional oscillating technology.”

The research and development team at Clemson concluded that intermittent oscillation gives food and thermal processing developers an increased capability to develop new innovative thermal processes. Dr. Whiteside added, “Intermittent oscillation’s greatest benefit is that it provides processors with another tool in their toolbox for creating new and innovative products that could not be done with previous technology.”

STOCK ICONSMS



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Dr. William Whiteside, Ph.D.
Clemson University