

# AQUAFLOW

POST-PACKAGE  
PASTEURIZATION

SOLUTIONS



Heating and Chilling Solutions with  
Precise Control and Uniformity



**MARLEN**

A DURAVANT COMPANY

# PRECISE CONTROL

## CONTINUOUS PASTEURIZATION

Our Aquaflow system is designed to pasteurize a wide range of food products. Engineered with food safety, efficiency, and footprint in mind, our Aquaflow provides critical water volume, movement, and recirculation for optimal heat transfer. With these three elements at its core, the Aquaflow can control the water temperature across the width of the belt and along the full length of the tanks to nominally within one degree. These systems can be designed with a custom tank size, including linear or stacked tanks for minimal footprint. Automatic loading and unloading systems are also available for a turnkey solution.

## FEATURES & BENEFITS

- Water immersion transfers heat about ~24 times faster than air
- Direct steam injection is used for efficient heating of the water
- Flighted belt design gently conveys product reducing risk of damage to packaging (leakers)
- Sparging manifold releases energy directly to product flights. A shower drench can be used for products that float.
- Multiple probes are used to control water temperature to +/- one degree
- Hygienic design with inline filtration and easy access for cleanup
- Ewon for remote monitoring, login for maintenance, and data logging capabilities for the ever-evolving IIoT and Industry 4.0
- Optional no-leak patented sealed electrical boxes withstand 1,350 psi direct spray to edge of silicone seal








The growing demand for small and new convenient formats in food & beverage has led to a transition from batch to continuous processing. There is a high level of competition in the market for “clean label” and “minimally processed” within the sector to present innovative and differentiating products and a new strategy in the world of post-package processing using the efficiency of water for heating and chilling products.

## WATER HEATING



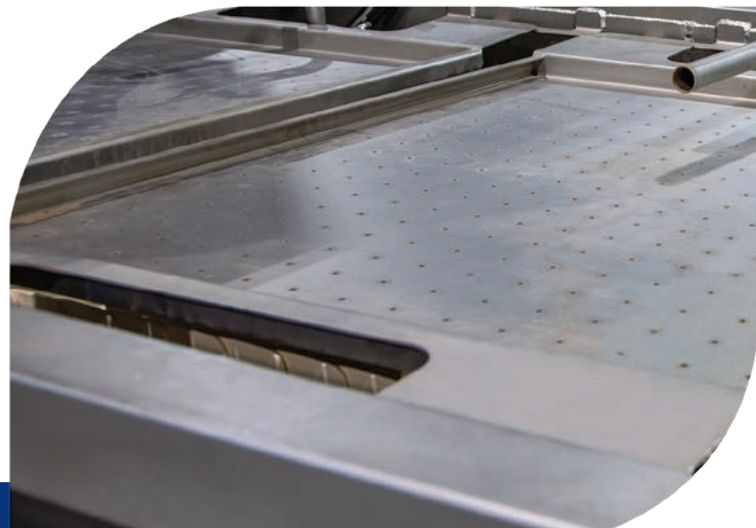
Our Aquaflow offers a scalable process that drives product consistency unlike any batch process out there. Recipe-driven controls enable operators to control product consistency and optimize results. Our Aquaflow continuous system eliminates double heating and handling, which saves labor and energy. Product is fed into the hot water and the control system instantly modulates the heat supply in response to increases or drops in thermal load, maintaining the process parameters.

## WATER CHILLING

Our Aquaflow can be used inline or as a dedicated solution for single stage or multi-stage chilling. The design is engineered to achieve critical chilling targets using a combination of water volume, movement, and recirculation. Our Aquaflow provides an efficient solution for a variety of viscous and non-viscous products that typically require gentle handling. A shower drench provides chilled water to product that floats while a sparging manifold efficiently delivers fresh chilled water, directly to each submerged product flight, to help reduce residence time and increase throughput capacity.



**THIRD-PARTY VALIDATION STUDIES  
HAVE BEEN CONDUCTED WITH  
MARLEN ENGINEERING TO VALIDATE  
HEAT TRANSFER & PROCESS TIMES.**





## WATER PASTEURIZING

Our Aquaflow Water Pasteurizers are third-party validated as published in the *American Journal of Food Protection*\* and designed for ready-to-eat food products by submersion heating for reduction of listeria monocytogenes. Our Aquaflow is USDA-FSIS Recognized Technology as a post-package pasteurization system\*\*. Marlen's control system and specially designed manifold provide uniform heat treatment along the length of the tank, and across the width of the tank vertically through the water column into the product belt flights. Using higher temperature regimens of up to 195° to 205° F

(90.6° to 96.1° C). Single zone or multiple independent temperature zones can be achieved by our separate and stackable tank design. Direct steam injection (DSI) is used for efficient heating of water and improved reliability for a fast and responsive pasteurization heating solution.

\**Journal of Food Protection*, Vol. 65, No.6, 2002, Pages 963-969

\*\*Food Safety and Inspection Service New Technology Information Table Last Update October 2019 / [https://www.fsis.usda.gov/sites/default/files/media\\_file/2020-08/complete-new-technologies-table.pdf](https://www.fsis.usda.gov/sites/default/files/media_file/2020-08/complete-new-technologies-table.pdf)





ULTRA-HYGIENIC

# DESIGN



8-PORT STAINLESS STEEL BLOCK



ACCESSIBLE BELT DESIGN FOR  
EASIER CLEANING



HYGIENIC CABLE MANAGEMENT



PATENTED NO-LEAK SEALED  
ELECTRICAL BOX



# ADVANTAGES OF MARLEN AQUAFLOW SYSTEMS

## AN EFFECTIVE AND MORE EFFICIENT PROCESS

If your product lends itself to heating or chilling in water, it is undisputed that water will transfer heat much faster than air. In fact, the thermal conductivity of water is .58 (W/m K) and air is .024 (W/m K) Watts per meters kelvin. In other words, water will transfer heat about 24 times faster than air. Marlen's Aquaflow solution leverages the efficiency of water and uses direct steam injection for hot water treatment along with an aggressive, high volume, recirculation approach to cold water treatment for efficiently chilling products to below 30° F (-1° C).

## A GENTLE MORE CONTROLLED WAY TO HEAT AND CHILL

Improve control and safety with Marlen's Aquaflow, continuous water bath process to heat and chill product in packaging. A flighted conveyor gently carries your product through the entire process – no racks, baskets, or batch loading required. Recipe-driven software ensures accurate control of product-specific conditions to maintain water temperature to nominally within one degree throughout the entire tank, reducing residence time. Whether you are processing form-fill seal pouches, pre-made flat or stand up pouches for snacks, beverages, cereals, soups, sauces or any other food type, the Aquaflow is a validated USDA-FSIS recognized technology, and the leading continuous water cook and chill system.



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