

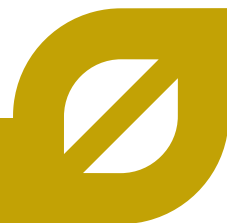


PASTEURIZATION STERILIZATION

EQUIPMENT FOR



“Dry saturated steam is the most effective heat treatment to kill pathogens, spoilage organisms and infestations.”



RISK ASSESSMENT

|| *Regulatory Landscape*

- Micro-organisms are naturally present in low moisture foods
- Even though no growth is possible, the presence of pathogenic organisms in low numbers can be harmful
- Implementation of the Food Safety Modernization Act (FSMA) will have far reaching implications for the food industry

“Based on the almond industries risk assessment, a 4-log reduction is required to sell almonds in North America; however the FDA performance criteria for labeling almonds as pasteurized is 5-log.”

NAPASOL PERFORMANCE

- *The Napasol system is precisely controlled & the process can be adapted to your desired log-reduction (2-log - 7-log)*
- *Extend your products shelf life*
- *Reliably conform with the microbiological specifications of your most demanding customers*
- *A validated pasteurization process that ensures all the product is pathogen free, protects your brand from costly recalls and opens new markets for your high quality products*

PASTEURIZATION

|| *saturated steam conditions*

Steam pasteurization effectively kills: **Pathogens** (*Salmonella, E. coli, Enterobacteria*), **spoilage micro-organisms** (*mold, yeast*), **infestations** (*insects at all stages of their life-cycle*)

- **Dry saturated steam** is much more effective than wet steam or superheated steam
- **Dry saturated steam** can be applied at a variety of temperatures including low temperature in a vacuum, protecting delicate products from exposure to excessive heat



"Manage the microbiological safety of your products in-house"

VALIDATED KILLSTEP

|| for low moisture products

- Treatment of products of all shapes and sizes; **Whole kernels** or **pieces, leaves, roots, cut, diced, sliced** and **ground** products and **powders**
- Validated 5-log pathogen reduction for a wide range of products
- No moisture pick-up and minimal impact on the organoleptic qualities of the product
- Precisely adjustable pasteurization temperatures from 60°C - 121°C (140° F - 249° F)
- Organic process, no use of chemicals

CUSTOMBUILT

|| for your product flow

- Napasol's modular systems cover a wide range of capacities 150kg/h - 12'000kg/h (330 - 26'000 lbs/h)
- Flexible logistical solutions
- Compact footprint that fits into your production environment
- All units are custom built to customer specifications

www.napasol.com

LOWOPERATINGCOSTS

|| Give you the competitive Edge

- Low energy consumption due to closed loop thermal system
- No moving parts means low maintenance cost
- High level of automation results in reduced labor cost
- Automated record keeping for full traceability and documentation of each batch





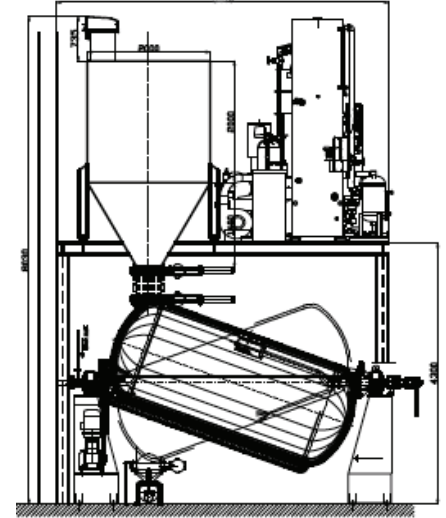
"Blending and pasteurizing of free flowing products in one step"

ROTOSOLDESIGN

|| Rotating blender/pasteurizer

ROTOSOL's new design keeps the products free flowing. The dynamic process is ideally suited for **grains, pellets, powders, mixes** and other **free flowing products**.

- Dry saturated steam delivers a validated >5log reduction performance
- The rotation gently moves the product throughout the pasteurization/sterilization cycle keeping even the most difficult powders free flowing
- Automated loading and unloading facilitates the handling of powders reducing dust in your production facility



FEATURES

- Stainless steel construction
- Precisely heated double jacket heating
- Mirror polished interior for facilitated unloading and cleaning
- Automated valve for loading and unloading
- Cooling system available for certain products
- Easy to use control panel (Touch Panel)
- Napasol software package
- Easy integration into existing production environment
- Complete engineering and consulting service by Napasol
- Integrated CIP system for efficient cleaning

COMPACT EQUIPMENT

|| Small footprint

- Combined blending/pasteurization capability simplifies your production process
- The compact installation easily fits in most production environments
- Short cycle times facilitates the integration of the process into a continuous production flow
- Optional cooling step can be integrated for certain products

CUSTOMBUILT

|| To your specifications

- Napasol's modular systems cover a range of capacities: from 150kg/h up to 12'000kg/h (330 - 26'000lbs/h)
- Extend your blending/pasteurization capacity with the growing needs of your company by adding additional units sharing the existing auxiliary systems (*steam, chilled water, compressed air*)



|| *Static pasteurizer/sterilizer*

-

- Stainless steel construction
- Chamber including doors are double jacketed
- Flexible logistical solutions - Process bins, racks, trays
- User friendly touch screen panel
- Napasol software package
- Easy integration into a existing production environment
- Complete engineering and consulting service by Napasol

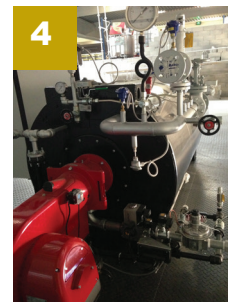
"Small footprint and modular assembly allow integration into your production flow"

TECHNICAL COMPONENTS

|| Of a Napasol Installation

1. Treatment chamber
2. PLC/Operator interface

3. Condenser/vacuum pump
4. Steam generator
5. Water chiller



EQUIPMENT

|| Customizable, modular system

- Custom built core equipment combined with locally sourced auxiliary systems (*steam generator, water chiller*)
- Industrial PLC (SIMATIC) for optimal reliability
- Compact footprint for easy integration into your existing production environment

SERVICES

- *Napasol provides complete engineering and consulting regarding the integration of the pasteurization step as a CCP (Critical Control Point)*
- *Start-up, staff training and validation of the system*
- *Remote access assistance for optimized technical availability of the plant*

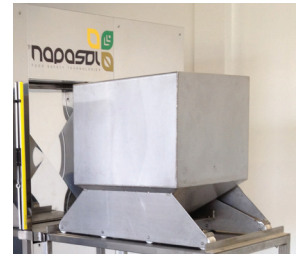


“A technology based on sterilization science applied to the pasteurization of low moisture foods”

RESEARCH & DEVELOPMENT

|| Testing and training facility

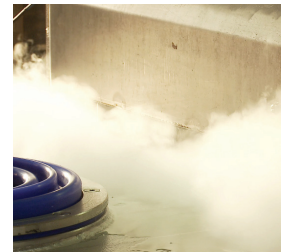
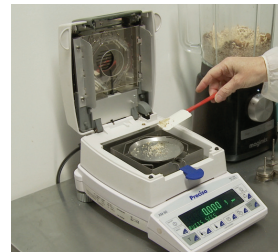
- Available to our clients, our R&D facility is fully equipped with both a static and rotative pasteurizer
- Hands-on running of the equipment for customer training
- Testing and cycle development for customer products
- Laboratory equipped for product analysis



FULLY DOCUMENTED

|| FDA compliant process

- Napasol has developed individual programs for a large range of products with optimized treatment parameters
- The Napasol system provides automatic record keeping of all critical parameters for each batch
- The full traceability regarding your kill step is key to protect your company's assets in case of product recalls



Notes:

Napasol AG
Binningerstrasse 95
CH-4123 Allschwil
SWITZERLAND

Phone: +41 61 712 33 22
E-Mail: safefood-ch@napasol.com

Napasol North America
503 N. 7th St. Suite 101
Fargo, North Dakota 58102
U.S.A

Phone: +1 701 478 30 20
E-Mail: safefood-us@napasol.com
