

SAFE & EFFECTIVE KILL-STEP TREATMENT FOR NATURAL DRY INGREDIENTS

bioactive

services

Sterilization Services

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The Challenge: In 2009 the FDA's banned the use of the chemical ethylene oxide as well as iodizing radiation for sterilizing raw nutraceuticals.

Our Response: Create an effective, safer way!

Our Goal: Provide a safe and superior continuous heat /steam treatment that works with BOTH dry & high moisture food products that could reduce or eliminate microbial contamination of delicate ingredients, in various forms (e.g., slices, tea cut, dices & powdered material).

The Outcome: The ability to treat a diverse amount of ingredients sizes and shapes with a consistent outcome of ≥ 5 log without losing any of the natural benefits of the ingredient.

- Herbs
- Botanicals
- Spices
- Vegetables
- Flours
- Fiber
- Proteins
- Pulses
- Grains
- Seeds
- Nuts

We Provide a superior organic pathogen reduction treatment. Our unique technology is specifically advantageous for aromatic products, such as herbs and botanicals, that are very sensitive to heat & moisture. Our process has been optimized to minimize the negative impacts found in traditional sterilization on flavor, color vibrancy and moisture content.

Our Protocol Library is maintained with the support of our European collaborative organization. It is ingredient specific for bio burden reduction of numerous dried food types, used in multiple industries with diverse requirements. This allows us to maintain the stability of volatile oils, natural moisture content, and true color, assuring you of a superior process producing the safest and highest quality ingredients for your manufacturing needs.

Processing Capacities :
270 to 500 kg/hour (dependent on various factors)

Capabilities :
Powder, Piece, Slice, Whole, Leaf,
Crushed, Chopped.

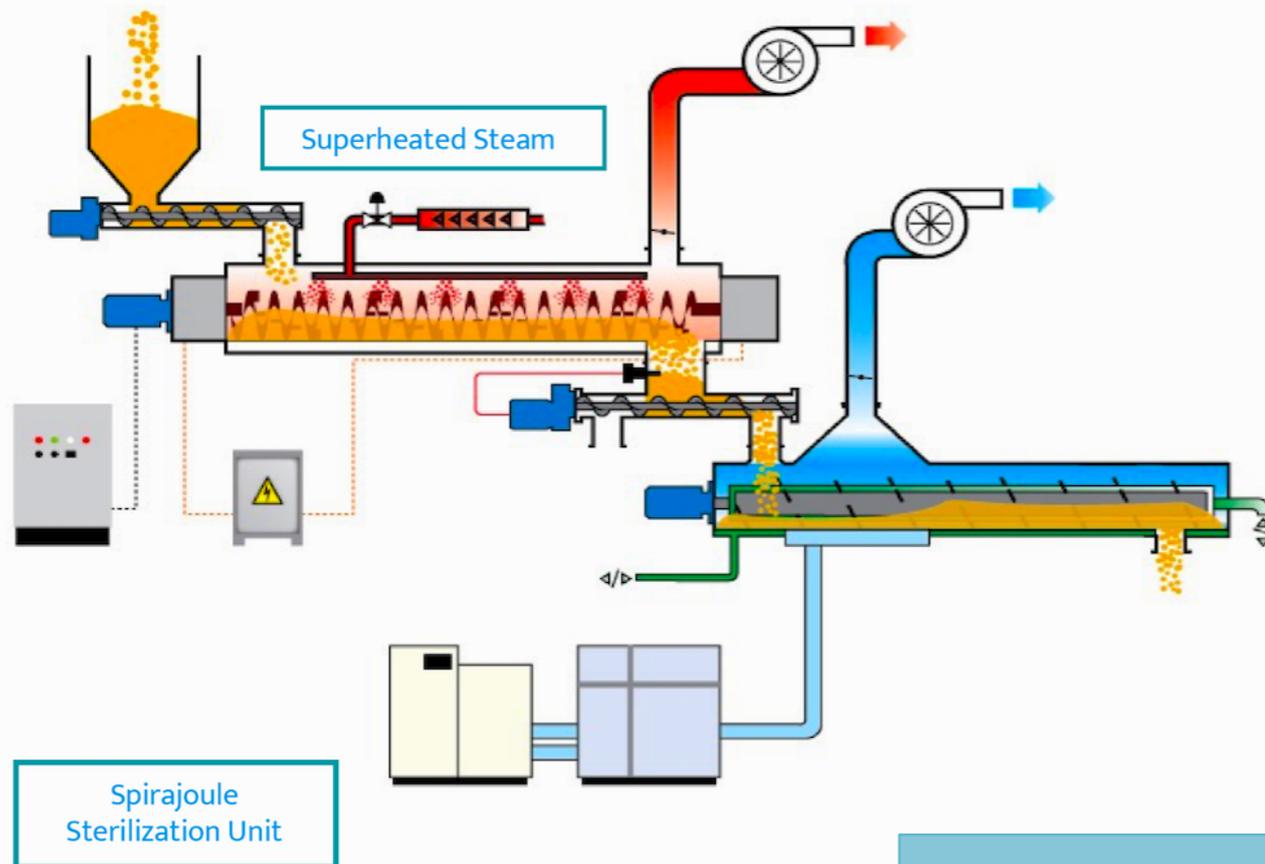
Does not affect the organic status
of treated products

Treatment Options

⚡ Pasteurization ⚡ Roasting ⚡ Blanching ⚡ Sterilization ⚡ Drying ⚡



The Process

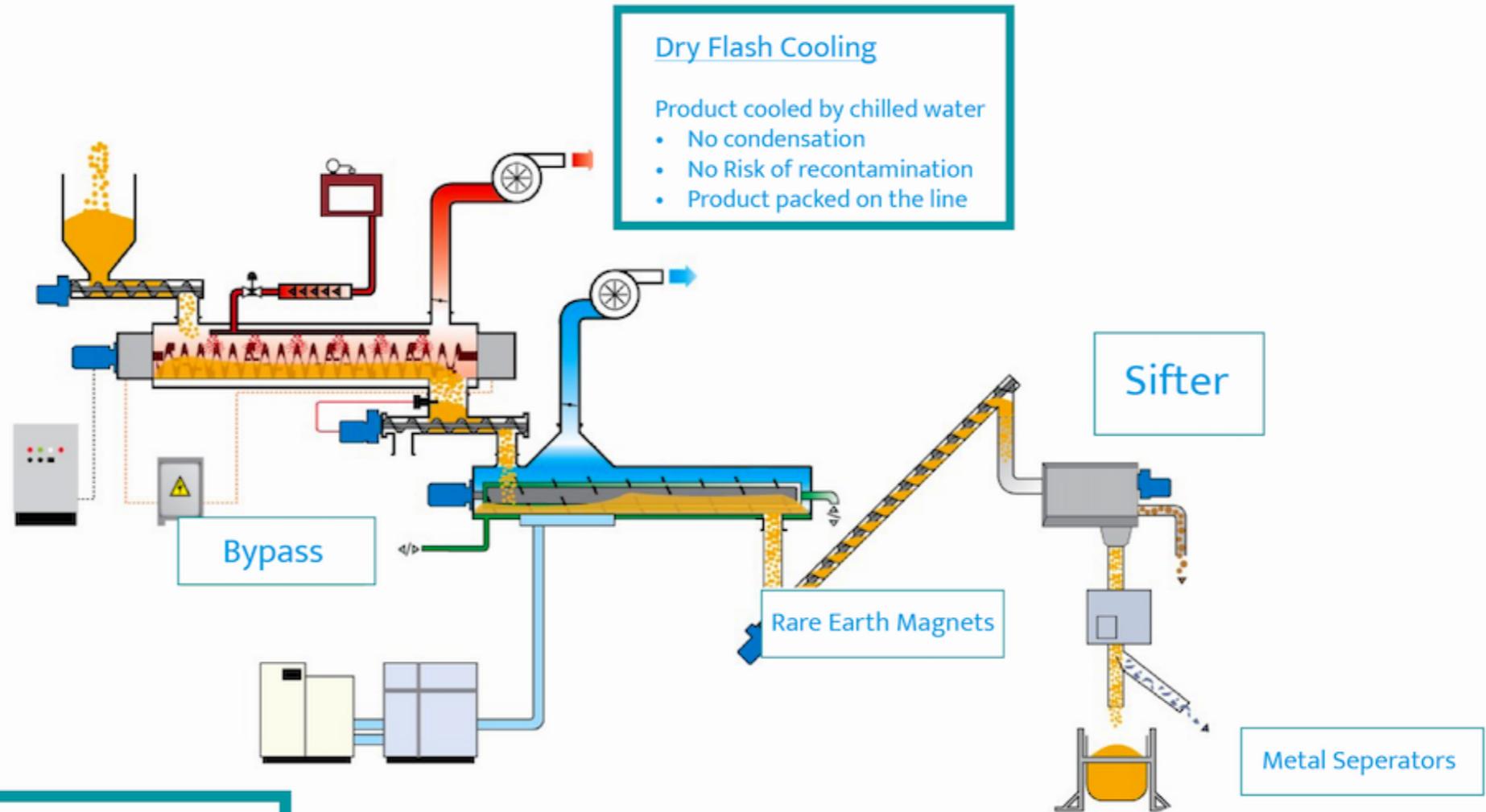


- Product is Taken to Lab for Microbial Load Testing to Determine Product Specific Protocols.
- Product is Loaded into Hopper
- Using Continuous Dosing Feed the Product is Fed to a Patented Closed Chamber that is Housed with a Heated Rotating, Coreless Auger (between 90 - 300 ° C)
- While Product is Being Moved by the Screw, Super-Heated Dry (or wet) Steam is Injected into Chamber
- Combination of Dry Screw Heat and Dry / Wet Steam Reduces the Microbial Load

- At the Other End Treated Product is Loaded into a Patented Cooling Chamber for Flash Cooling. This Flash Cooling will Further Reduce Microbial Load and Complete Validated Kill Step Requirements
- All Products Are Subject to Sifting and Metal Detection to Further Ensure Safety at the End of the Cooling Process
- Product is then Collected at the End of Cooling Unit and Packed



Safety Measures



Dry Flash Cooling

Product cooled by chilled water

- No condensation
- No Risk of recontamination
- Product packed on the line

Bypass

Sifter

Rare Earth Magnets

Metal Separators

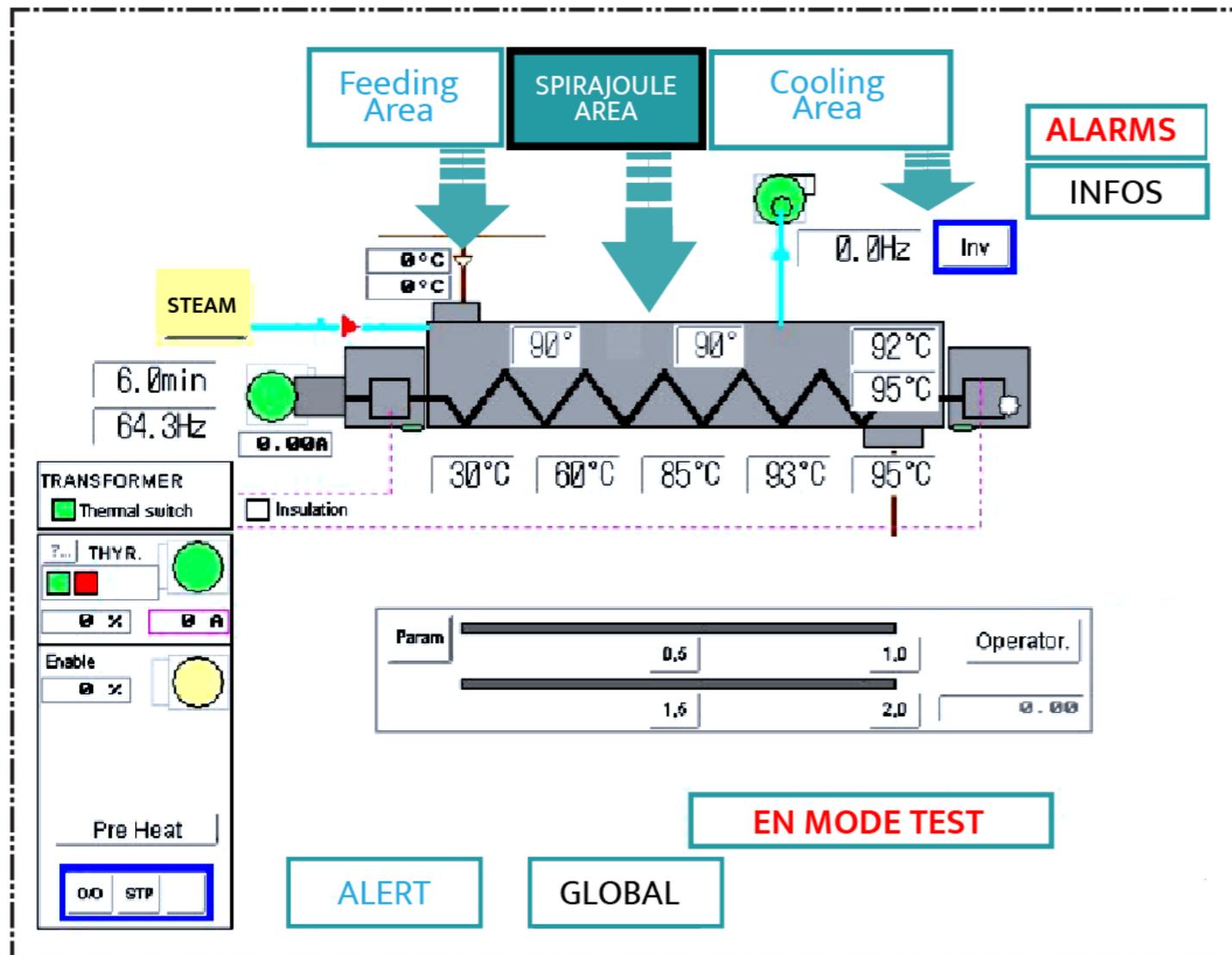
SafeSterile® Software

7 Sensors monitor for irregularities/hot spots throughout the entire process

This guarantees that the entire product is heated and maintained more than M min at X °C

Metal Detector Sensitivity

- Stainless Steel 2-2.5mm
- Ferrous: 1.5-2mm
- Non Ferrous: 1.5-2ppm



Uses an Electrically Heated Screw in Combination with:
Saturated Steam, Super Heated Dry Steam or No Steam at All !

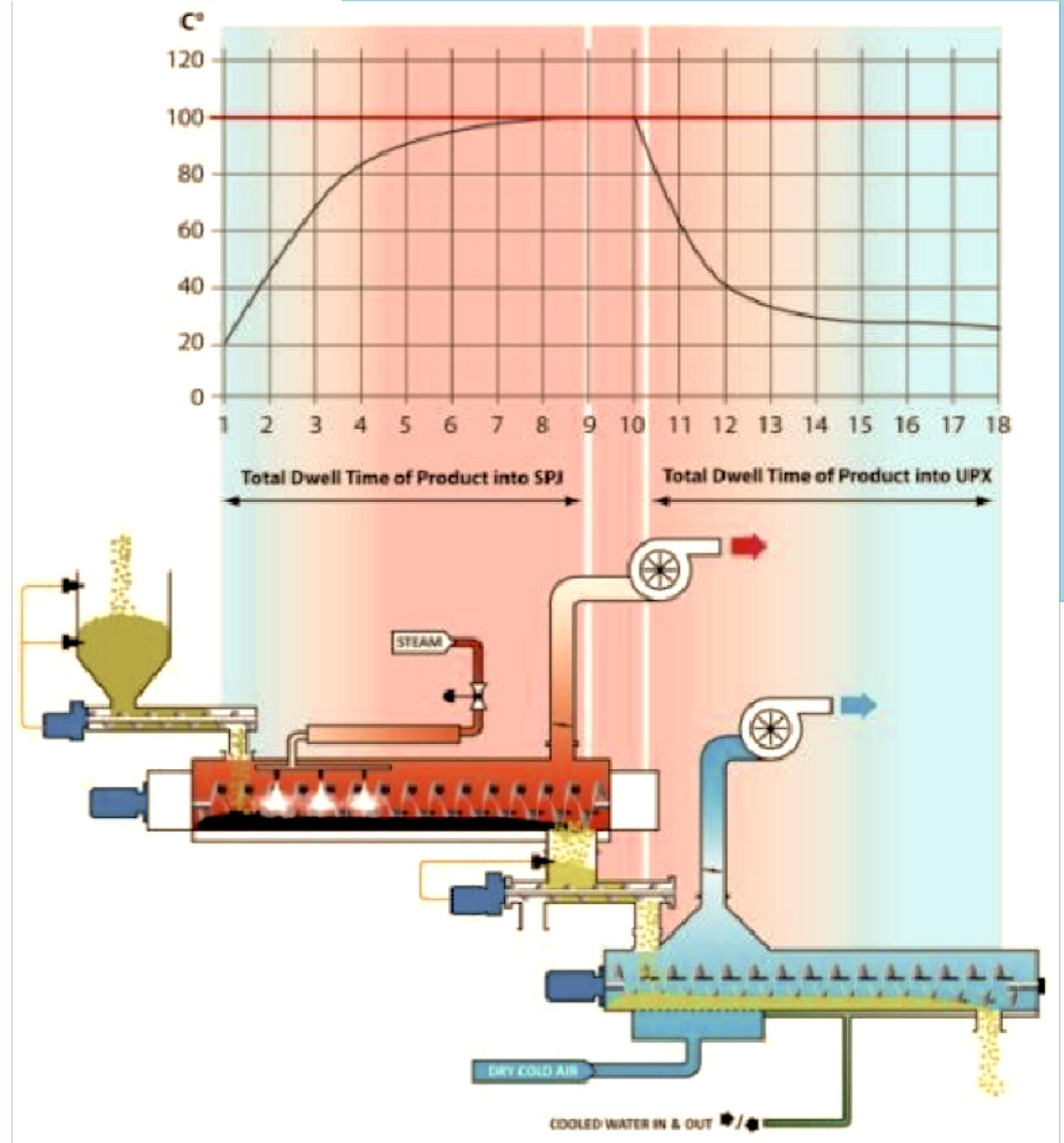
Through this control, it is possible to monitor and to do traceability of the heat treatment, while respecting the products' sensitivity and the decontamination target.



PLC

SAFESTERIL® SOFTWARE:

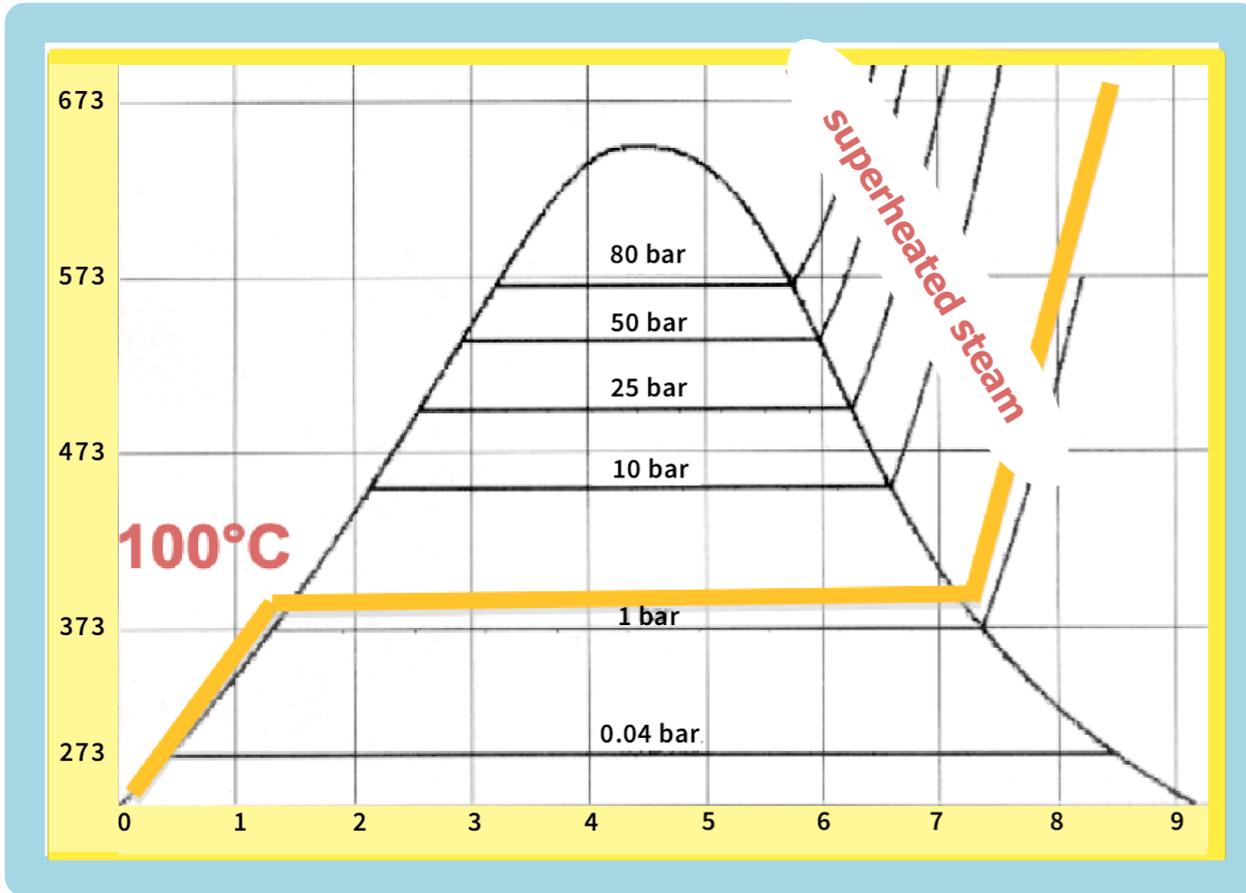
- Operating parameters are recorded
- Critical Control Points (CCP) follow-up
- Guarantee that the entire product is heated & maintained more than M min at X °C





Performance

Sunflower Seed & Moisture



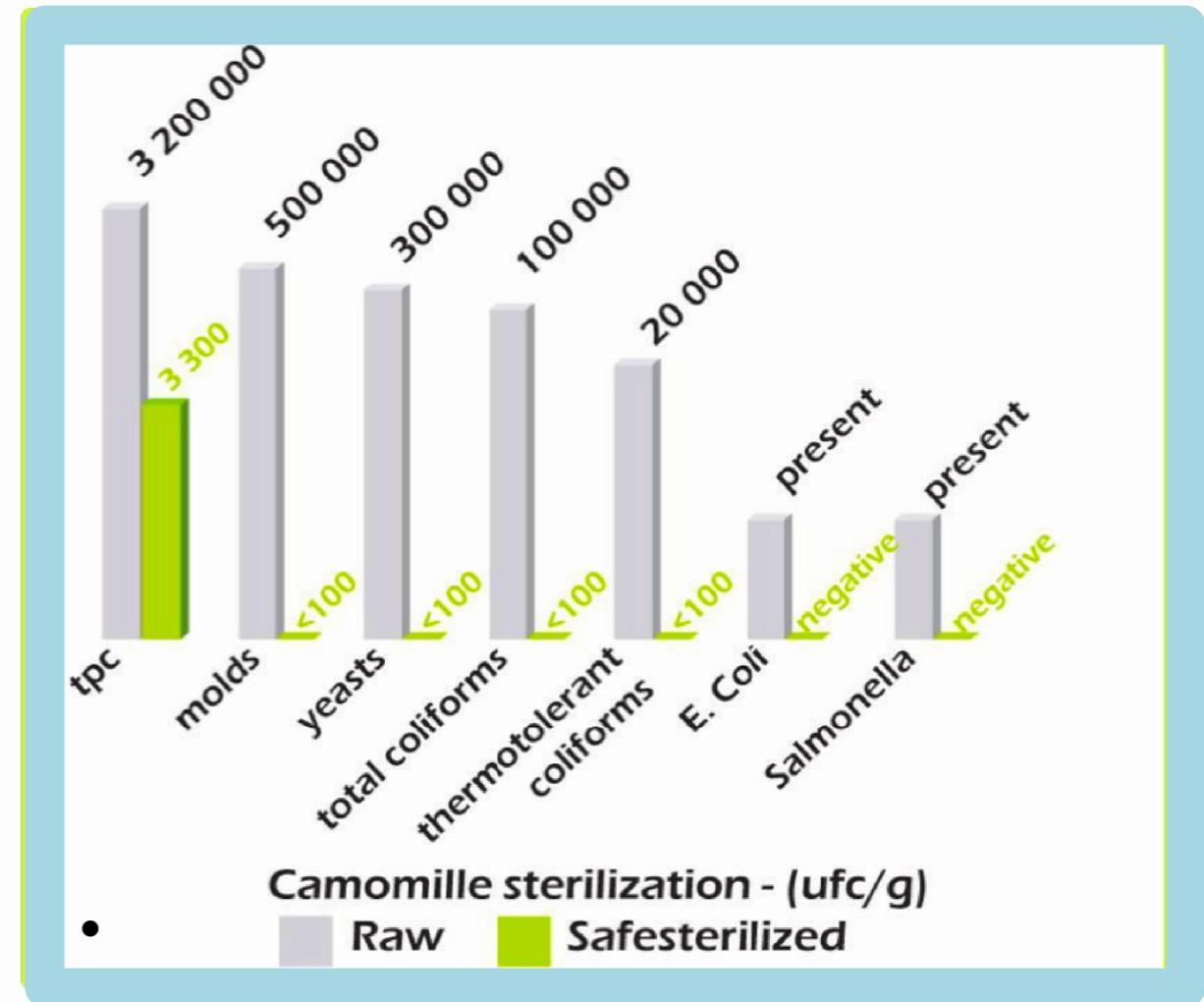
Initial Moisture: 8 %

Final Moisture 8%



Chamomile Volatile Oils & Moisture

	Volatile Oil	Moisture
Before Processing	0.37%	10.8%
After Processing	0.35%	10.3%



- Physical Aspects Remain Similar, **Minimum Loss** of Volatile Oil, **No** Added Moisture

Value Added Services

At No Additional Cost

- Repackaging options from 15kg to 500kg
- Magnetic Sifting
- Full Compliment of Safety Certifications
- Gluten Free /Low Allergen Facility in Nevada



- Laboratory Services
- Microbiological Analysis
- Pathogen Analysis

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Safe. Standardized. Certified.

