

# ADVANCED SOLUTIONS FOR SPICE STERILIZATION



PerMix, with extensive experience in the production of industrial mixers, presents an innovative technology for spice sterilization: a **dynamic steam sterilization system specifically adapted for the spice, herb, and ground spice industry.**

Against the backdrop of increasing regulatory trends that are tightening the restrictions on the use of gamma radiation for food sterilization, and in the wake of growing prohibitions, steam sterilization is becoming the preferred and, in many cases, the only viable option.

PerMix's solution provides an efficient and safe alternative, ensuring a significant reduction in bacterial populations while preserving the product's natural quality.

This efficient process typically achieves complete sterilization cycles in as little as 60 minutes per batch, depending on product type and batch size, significantly reducing processing times.

## Key Advantages of the PerMix Sterilization System



### Gentle and Effective Sterilization

Our technology uses pressurized steam for rapid elimination of microorganisms, followed by vacuum drying at low temperatures to preserve the organoleptic properties of the spices.



### Proven Bacteria Reduction

The system guarantees a reduction of up to 5 logs in TPC levels, meeting the strictest food industry safety standards.



### Preservation of Product Quality

Thanks to the dynamic mixing process, all spice particles are treated uniformly, which shortens processing times and protects the unique color, aroma, and flavor of the spices.



### Operational Flexibility

The system is designed for batch operation, enabling quick changeovers between different types of spices and ensuring easy and efficient cleaning.



### Versatility

Furthermore, since the system is based on a powder mixer, it can also be used for various mixing purposes, such as preparing spice blends or sterilizing existing spice mixtures (in cases where some spices in the blend are more sensitive to thermal processes).



### Precise Control

An advanced control system allows for precise management of the sterilization process, including control over the final moisture levels of the product.



### Energy Efficiency

The unique design of the system maximizes heat transfer and reduces energy consumption compared to traditional sterilization methods.



### Hygienic Design

The system complies with GMP requirements and includes built-in WIP/CIP systems for efficient and automated cleaning.



### Modular Solution

The system is provided and designed according to customer needs, as a compact and independent unit, enabling easy and quick installation even in facilities with limited space.



The sterilization process in the PerMix system consists of five main stages, ensuring efficient and gentle treatment of spices:



## Stage A Material Loading

The non-sterilized spices are loaded into the system.



## Stage B Pre-heating and Drying

The spices are pre-heated and partially dried to prepare them for the sterilization stage.



## Stage C Pressurized Steam Sterilization

Pressurized steam is injected into the system, ensuring effective elimination of microorganisms.



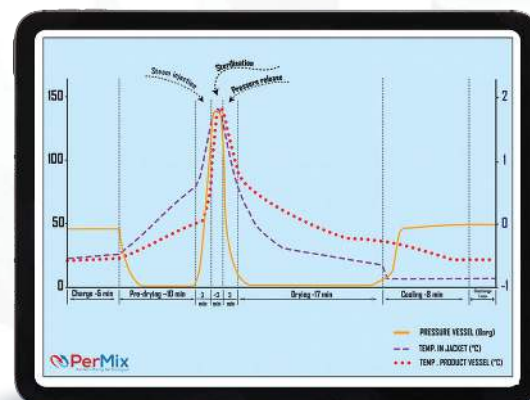
## Stage D Rapid Vacuum Cooling and Initial Drying

The vacuum assists in rapid cooling of the spices and initiates the final drying process.



## Stage E Cooling to Ambient Temperature and Discharge

The spices are cooled to room temperature and discharged from the system.



The graph illustrates the changes in temperature and pressure over time during the sterilization process. The X-axis represents time, and the Y-axes represent temperature (dotted red and blue lines) and pressure (yellow line).

## Applications

The PerMix dynamic sterilization system is suitable for a wide range of spices, including



**Spice powders**  
(such as chili, turmeric, curry)



**Spice seeds**  
(such as coriander seeds, cumin seeds, mustard seeds, sesame seeds, allspice, etc.)



**Dried herbs**  
(such as oregano, parsley)



**Spice blends**

## Pilot System for Spice Sterilization

PerMix also offers a small-scale spice sterilization system with a capacity of approximately 15 kg per batch. This system is specifically designed for developing optimal sterilization processes and conducting trials by customers who wish to test the effect of sterilization on their specific products. It enables the optimization of sterilization parameters before implementing the process on an industrial scale.

## PerMix - Your Partner for Advanced Spice Sterilization

PerMix is committed to providing its customers with innovative and reliable solutions for spice processing. With our dynamic sterilization system, you can ensure the safety and quality of your products while streamlining production processes and reducing operating costs.

