

# STEAM DECONTAMINATION

Spices, herbs and seeds





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# 1. INTRODUCTION

Spices, herbs, seeds and nuts and dehydrated vegetable substances bring a world of flavors, aromas and colors to our tables.

The potential for pathogens like salmonella, yeasts, moulds, enterobacteraceae and sporeformers to get into the food supply has resulted in the trend towards more stringent Good Agricultural Practices and regulations.

Spices and herbs are sourced worldwide and they may be heavily contaminated from the soil where they were grown and harvested.

These microbes often remain after local processing due to simple treatments and processing at low temperatures.

If left untreated, these products may encounter continued microbial growth that can easily lead to spoilage and consumer health issues.

There are many commonly used methods to decontaminate natural products, such as ethylene oxide and irradiation but most have been or will soon be restricted due to their potential health risks and adverse consumer acceptance.



## VENTILEX STEAM STERILIZATION BENEFITS:

- Natural, renewable process that utilizes steam and is accepted worldwide as safe and wholesome.
- Continuous decontamination of bacteria and pathogens – 5 log kills are typical.
- High Temperature, Short Time processing (HTST) which protects the taste, texture, and color of the product and ensures a minimal loss of volatile oil.
- Very gentle for leavy products.

## 2. SAFE CONTINUOUS STEAM STERILIZATION: NATURAL ELIMINATION OF BACTERIA

The use of steam is ideal as it is natural, inexpensive and can be produced in an unlimited supply. It is a natural 'organic' process that does not leave behind any chemical residue or create toxins.

Steam pasteurization / sterilization systems are the most effective 'natural' method for reducing or eliminating bacteria, pathogens, and other food-borne causes of sickness.

Effective steam treatment will eliminate listeria, salmonella, E. Coli, and a variety of other bacteria and pathogens. As a result, many of the world's largest spices and herbs processing companies have selected Ventilex continuous steam sterilizers/pasteurizers. More than 100 systems have been supplied worldwide.

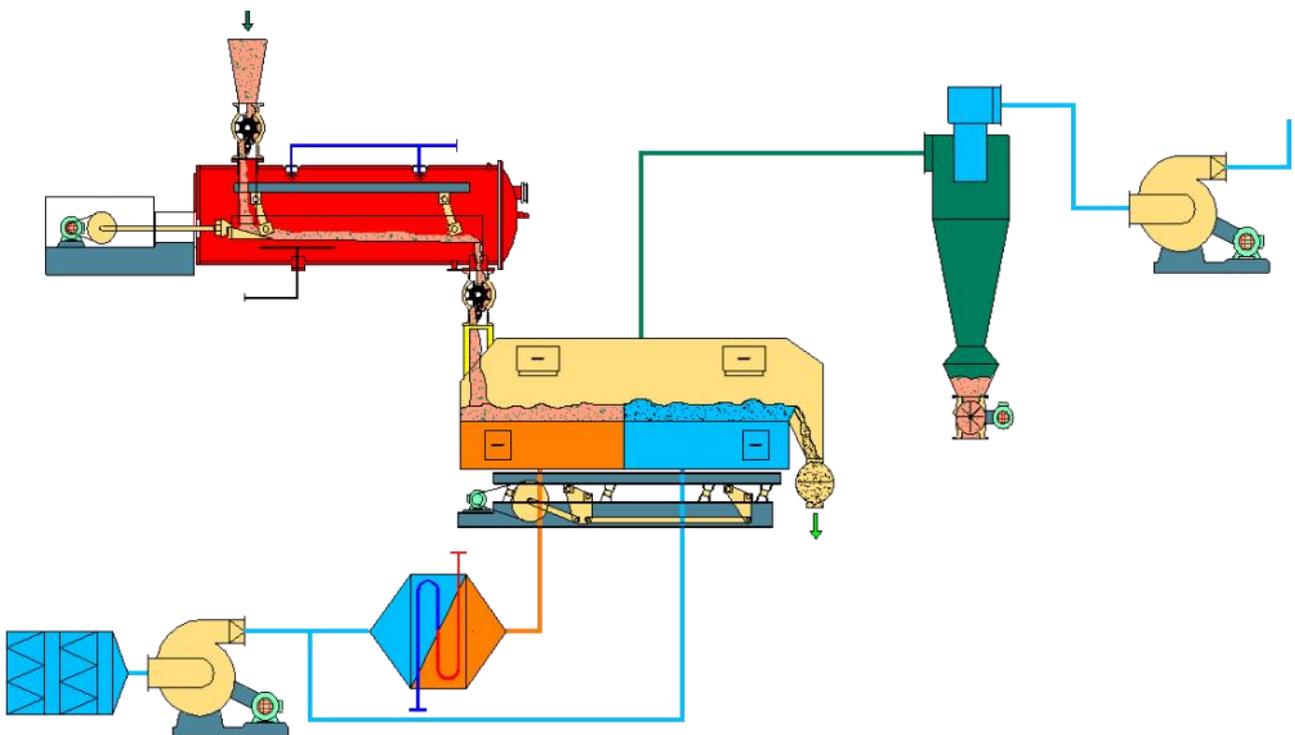
### MODERN, HYGIENIC AND CHEMICAL FREE STEAM TREATMENT PROCESS

With the Ventilex system, you get a continuous 'inflow' of high pressure steam that results in the elimination of undesired microorganisms while causing the minimum harm to the organoleptic characteristics (flavor, color, texture or taste) of spices, herbs and nuts.

Our system can be used to process chili powders, whole and ground pepper, paprika, garlic, cloves etc., and a variety of herbs, seeds, and other spices. We can do leafy spices without harm to the leaf due to our gentle shaking action – there is no screw conveyor that can damage the product.

The continuous system treats powders as well as whole spices, which is a unique feature of the Ventilex system.

In addition, steam treatment is effective in the deactivation of enzymes, e.g. amylase and lipase. This cannot be done with irradiation or ethylene oxide treatment. These enzymes have been shown to cause a breakdown of fat and starch components in sauces, salads and many ready-made meals. The heart of the nut is left natural and alive - it will still germinate. This makes it possible for the 'organic' food label to be applied and for certain products to be labeled as 'pasteurized'.



FLWSHEET VENTILEX STERILIZATION SYSTEM

### 3. STEAM STERILIZER OR STEAM PASTEURIZER

Ventilex offers two different technologies of decontamination systems commonly referred to as ‘steam sterilizers’ and ‘steam pasteurizers’.

#### CUSTOMIZED SYSTEMS

The main difference is that ‘sterilizers’ do their work in closed pressure vessels (autoclave) at up to 3 bar (45 psi) and ‘pasteurizers’ work at atmospheric pressure with superheated steam.

The selection of the appropriate technology depends on the size of the product itself and the type of pathogens to be eliminated.

We offer some standard sizes of sterilizers and pasteurizers to span the range of commonly specified capacities but each system is customized to meet the client’s specific requirements.

#### MEETING THE CLIENT’S SPECIFICATIONS

We typically work with a ‘Process Authority’ or the client’s microbiologist who performs the microbiological testing and sets the process parameters to be validated for regulatory compliance.

Our role is to supply equipment meeting these specifications. However, we offer a testing service to process samples inoculated with surrogate pathogens for process parameter development.



**CONTINUOUS HIGH PRESSURE STERILIZER**



**STERILIZATION OF PAPRIKA**

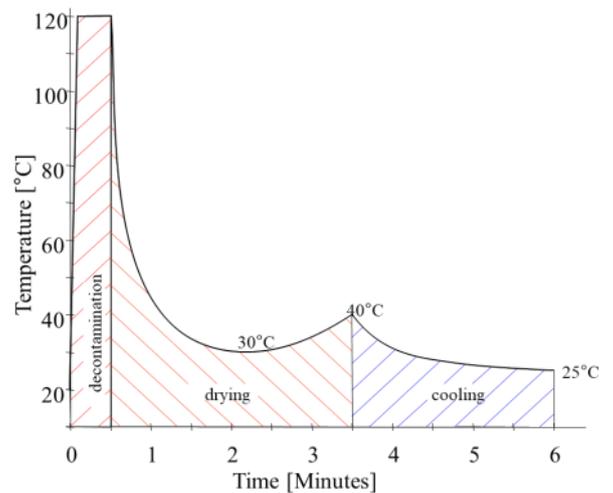


## 4. HOW DOES VENTILEX STEAM DECONTAMINATION WORK?

Ventilex continuous steam sterilization/pasteurization systems are designed for High Temperature, Short Time (HTST) decontamination. Steam is the fastest possible way of heating product to an exact preset temperature.

The HTST process exposes materials that are considered contaminated to high temperature steam for just a short time.

The material is then dried and cooled. This is a simple idea, but is one of the most practical and effective methods for treating products in this industry.



**PRODUCT TIME / TEMPERATURE CURVE**

### STEAM-PRESSURIZED CHAMBER

The process works by feeding and discharging the product through a self-cleaning pressure rotary valve that isolates an autoclave from the ambient room.

Inside this autoclave, a shaking table transports product through a steam-pressurized chamber at a specific speed and creates a thin layer of product.

Condensation builds on the product surface and this imparts high energy into the surface of the product. This kills unwanted bacteria and pathogens.



**AUTOClave WITH PRESSURE ROTARY VALVE**





Many companies have already partnered up with Ventilex for their decontamination needs.

Why? Steam sterilization is completely chemical free and safe!

The Ventilex Sterilizer is based on the principle of HTST (High Temperature, Short Time), which protects the taste, texture, and color of the product and ensures a minimal loss of volatile oil.



- Shortest duration of steam of any commercial system in use today – product still ‘natural’
- 5 log kills are typical
- Deactivation of enzymes
- Repeatable and verifiable process
- Product is decontaminated, dried and cooled
- Recipe based (for processing multiple products) – validated process
- Automatic sanitary Washing-in-Place (WIP)
- Hygienic design, high quality finish
- Low energy consumption and low maintenance costs
- Minimal operator intervention – automated controls

## Ready for your Ventilex Steam Decontamination System?

It's a **Ventilex**

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