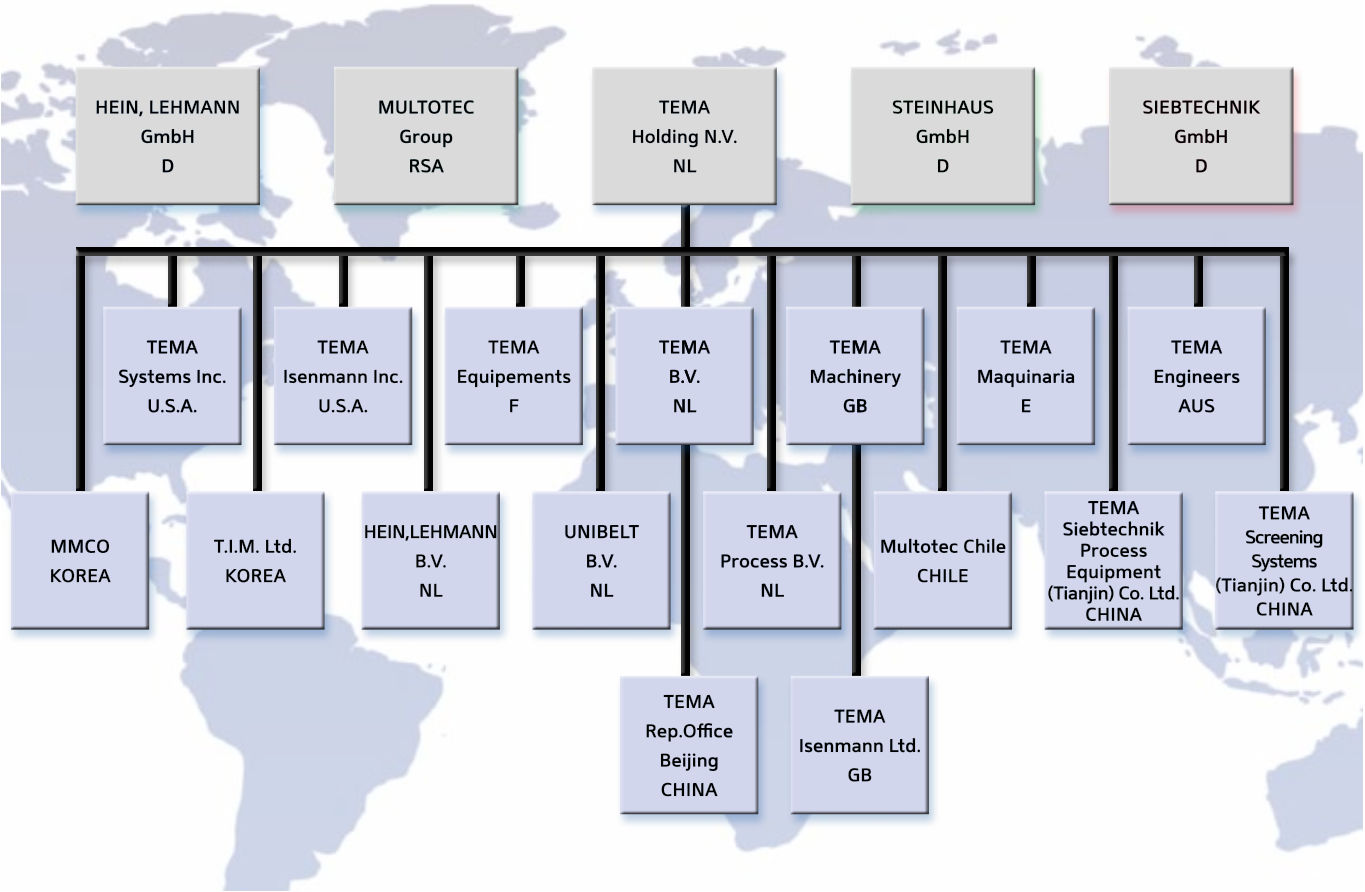
TEMA Process B.V.

Natural Pasteurization

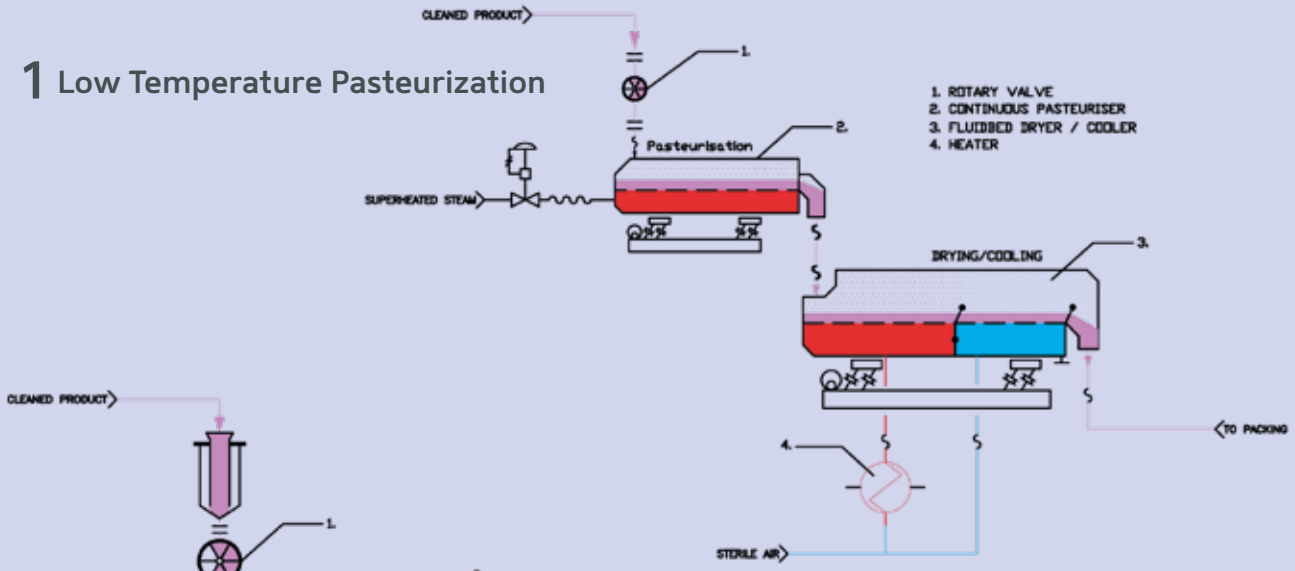
Introduction

The team that has successfully developed, engineered, fabricated, installed and commissioned continuous steam sterilizing and steam pasteurizing plants in the past 20 years has joined TEMA HOLDING N. V. in January 2010 to start a new Company.
25 plants for treatment of herbs, spices, seeds, nuts and other food ingredients are installed in the Netherlands, Germany, Hungary, Poland, Brazil, USA, India, Korea, China, Japan, Vietnam and Malaysia.
Starting a new company we have used the opportunity to incorporate 20 years of experience to update the designs of the equipment to combine the best performance with the lowest costs.

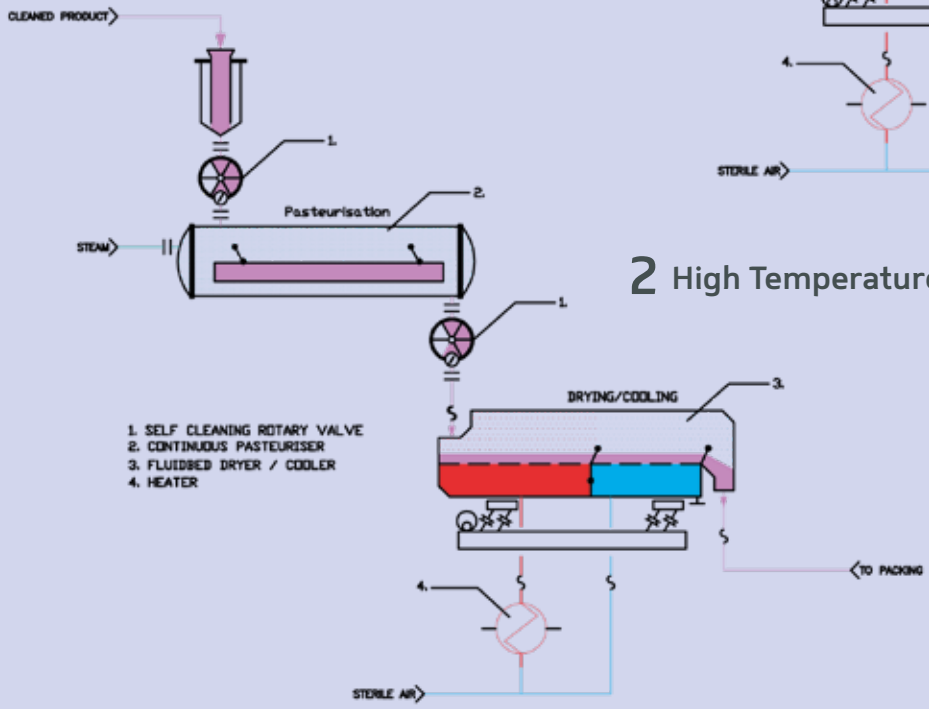


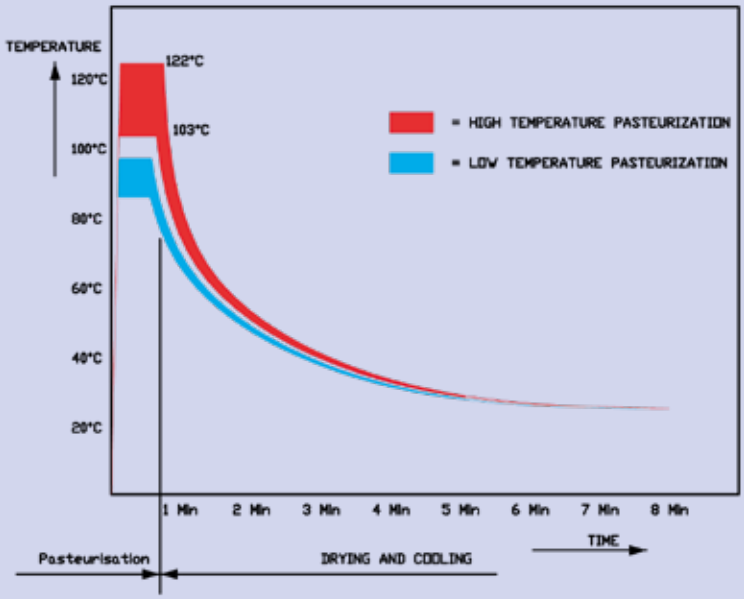
Two continuous systems for natural pasteurization

1 Low Temperature Pasteurization



2 High Temperature Pasteurization





Plants of natural pasteurization

1. Plants for pasteurization at temperatures below 100 °C

These plants are designed for rather clean hand picket and machine dried products such as herbs, seeds and nuts, e.g. for cinnamon, Parsley, garlic flakes, pistachio nuts, almonds, sun flower seed, dried vegetables etc.

Pasteurizer – Dryer / Cooler Installation

Pasteurizer

The low temperature pasteurizing plants have basically a shaking pasteurizer which is directly connected to a shaking fluid bed dryer/cooler using ambient superheated steam for pasteurization and sterile filtered air for drying and cooling.
The pasteurizing vessel has a perforated bed plate on which the product proceeds forward. The process is controlled by a PLC with data acquisition.

Inside view toppart Dryer + bedplate

Fluidized Bed Dryer / Cooler

Multifunctional decontamination plant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Plants of natural pasteurization

2. Plants for pasteurization at temperatures between 102 °C and 122 °C

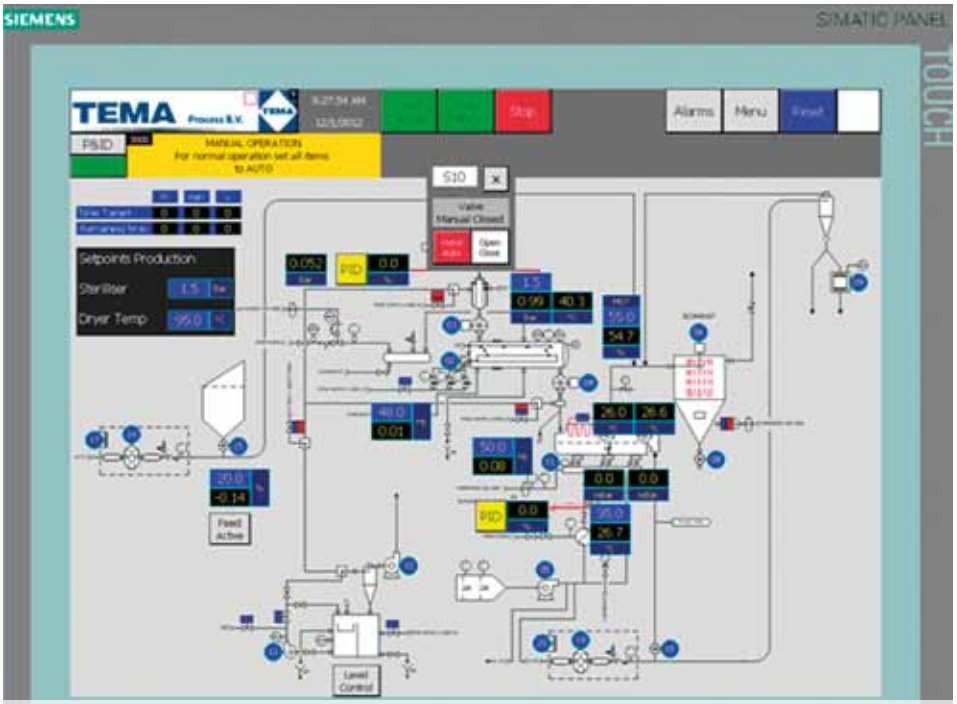
A variety of microbial reduction techniques are routinely employed within the industry for reduction of pathogens. These techniques include: fumigants (ethylene oxide and propylene oxide), steam and irradiation. Each technique has advantages and limitations in effectiveness, quality impact and consumer acceptance.

Natural sterilization/pasteurization with pure steam has gained significantly in popularity with the introduction of the continuous HT-ST "In-Flow" steam decontamination process.

These plants are multifunctional plants for heavy polluted sundried products to be processed at temperatures up to 122 °C.

The very short contact time (20-40 seconds) with high pressure steam at a temperature that may vary between 102 °C and 122 °C makes it possible to decontaminate heat sensitive herbs and spices without adverse effect on quality.

Pasteurizer/Sterilizer - Dryer/Cooler Installation and Dust Separator



Operator Control Panel

The continuous plants are characterized by the following features

- Suitable for powders and powder mixtures.
- Every product particle receives exactly the same treatment in time and temperature.
- The autoclave operates with pure steam without air.
- No recontamination possible since the dryer/cooler operates with sterile air.
- Absolute control of the moisture content after treatment by the dryer/cooler.
- The continuous autoclaves are equipped with self cleaning rotary valves for trouble free processing of powders with steam.
- Minimum loss of volatile oil.
- Minimum change of colour thanks to an ultra short heat treatment.
- The entire process from product feed to discharge to the packing room takes place in a closed system avoiding any contact with people.

More about steam as sterilizing medium

- Steam is cheap and not toxic.
- Steam provides water activity for efficient sterilization.
- Condensing steam provides for fastest heating.
- Evaporation of condensed steam provides for fastest cooling.


Exterior of Autoclave with Product Feedhopper and Rotary Valve

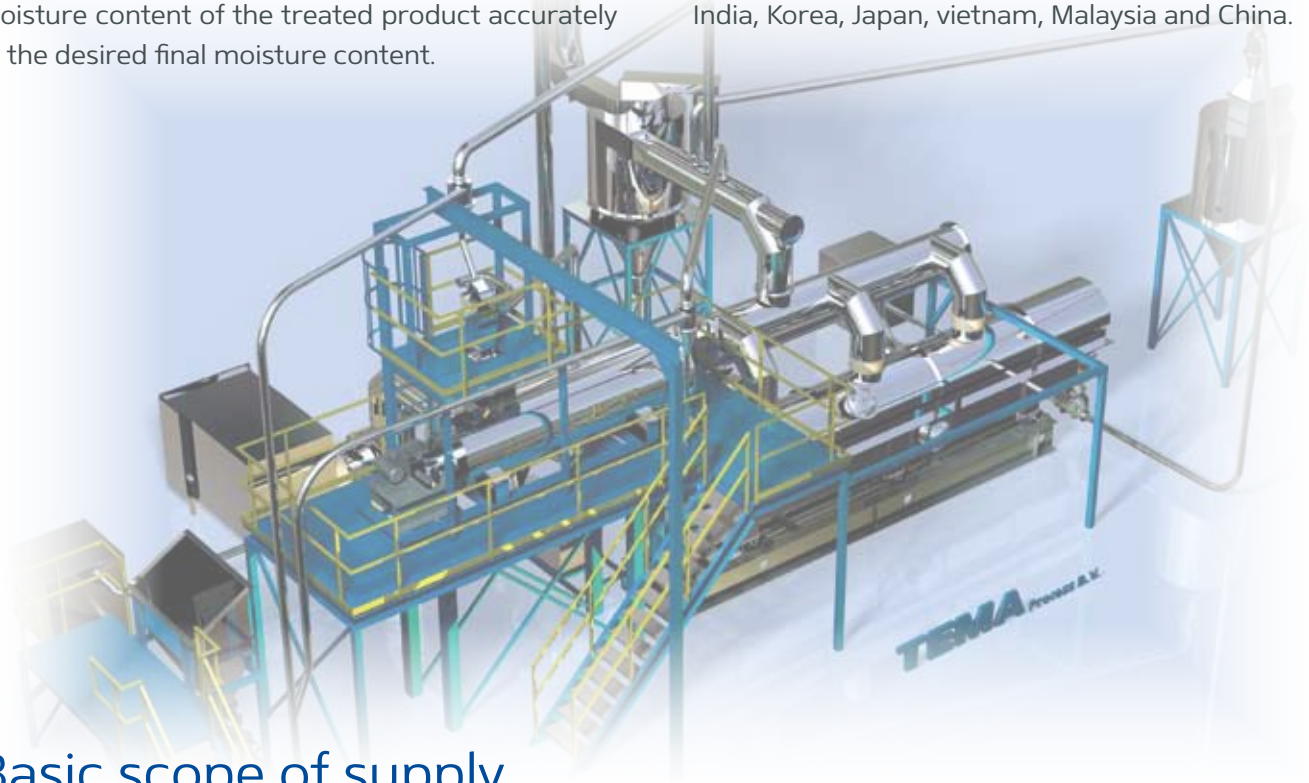

Interior of continuous Autoclave

Process description

Natural ST-HT steam sterilization / pasteurization for spices, herbs & botanicals, dried vegetables, seeds and nuts by TEMA Process B.V.

The continuous process uses a very special continuous autoclave with inside a so-called shaking bed conveyor and self cleaning rotary valves for respectively product feed into and out off the pressure vessel.
The process is further identified by a sanitary fluid bed dryer/cooler, using sterile filtered air to bring the moisture content of the treated product accurately to the desired final moisture content.

Automatic cleaning in place (C.I.P.) provides for quick change from one product to another.
The total process takes only 30 seconds for sterilization plus 7 minutes for conditioning. With the continuous process the product will not be subjected to a temperature above 55 degree C, longer than 60 seconds.
The first multifunctional plant has been installed in the Netherlands in 1990. Continuous steam decontamination plants are in operation in Holland, Germany, Hungary, Poland, Bulgaria, USA, Brazil, India, Korea, Japan, vietnam, Malaysia and China.



Basic scope of supply steam sterilizing plant

- Sterilizer, complete with support frame, platform and staircase
- Wet scrubber/ Cleaning in Place unit for sterilizer
- Fluid bed dryer/cooler
- Sterile air supply unit for fluid bed dryer/cooler
- Dust separator for exhaust air from fluid bed dryer/cooler
- Central control panel (PLC and suitable for data acquisition for HACCP)
- Instrumentation
- Spare parts for the first year of operation
- Supervision of erection and commissioning plus training of operators

Optional deliveries

- Pneumatic product feed to sterilizer using sterile air from filter unit
- Pneumatic product discharge from fluid bed dryer/cooler to packing room using sterile air from filter unit
- Finisher to turn agglomerates back into a free flowing powder

Capacities

- High temperature plants can be supplied in capacities ranging 500 - 3000 kg/h

Plants for other industries

Food & Feed Industry

Chemical Industry

Mineral Industry

Biomass Industry

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