FTNON

DCC Belt Steamer

Steaming and saving energy with the JBT FTNON DCC steam technology

FRESH-CUT, ROBOTICS, STEAMING

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JBT FTNON has a long tradition of producing blanchers and steamers. The JBT FTNON Dynamic Cloud Control (DCC) is a revolutionary steaming technology, that considerably improves the energy efficiency of steamers. Compared to conventional steamers, the exhaust of steam from the steamer is reduced to a minimum and considerable reductions on steam consumption, ranging from 30 up to 90%, are achieved. The related savings on water and energy consumption are really spectacular.

Conventional steamers

Most conventional steam cookers are adjusted to a temperature of 100° to 105°C / 212 to 221°F. In order to be sure that the steamer is fully filled with steam, an excess amount of steam is brought in. This excess amount of steam is carried away at the feed and outlet side of the steamer, and is exhausted to the ambient surroundings by means of a ventilator.

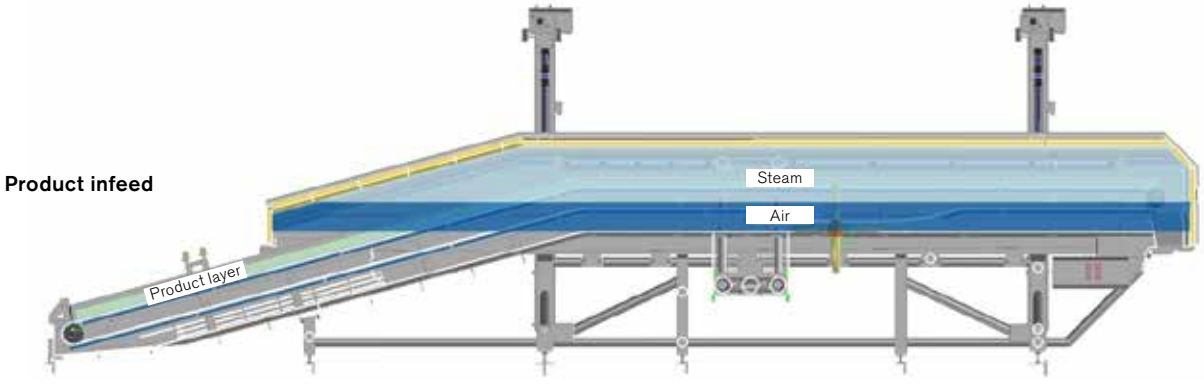
DCC - Dynamic Cloud Control

The DCC- Dynamic Cloud Control - concept is based on the use of difference in density between atmospheric steam and air. The system automatically creates a balanced and 100% steam atmosphere. Thanks to atmospheric pressure, the temperature will be ± 98-100° C / 208-212° F. The steam demand is based on product temperature and capacity.

Advantages

The advantages of the DCC technology are:

- Optimal heat transfer
- Minimum start-up time, ready for production in 5 minutes
- Minimum steam required for start-up
- Automatic steam regulation: no product = no steam
- Energy efficient system
- Minimum product colour loss
- No flushing out of nutrients, vitamins etc.
- Minimal waste water (only condensate)
- No need for exhaust systems
- Less time required for cleaning, because of top hygienic design and liftable hood.



The DCC system ensures a balanced and 100% steam atmosphere during production.

Applications

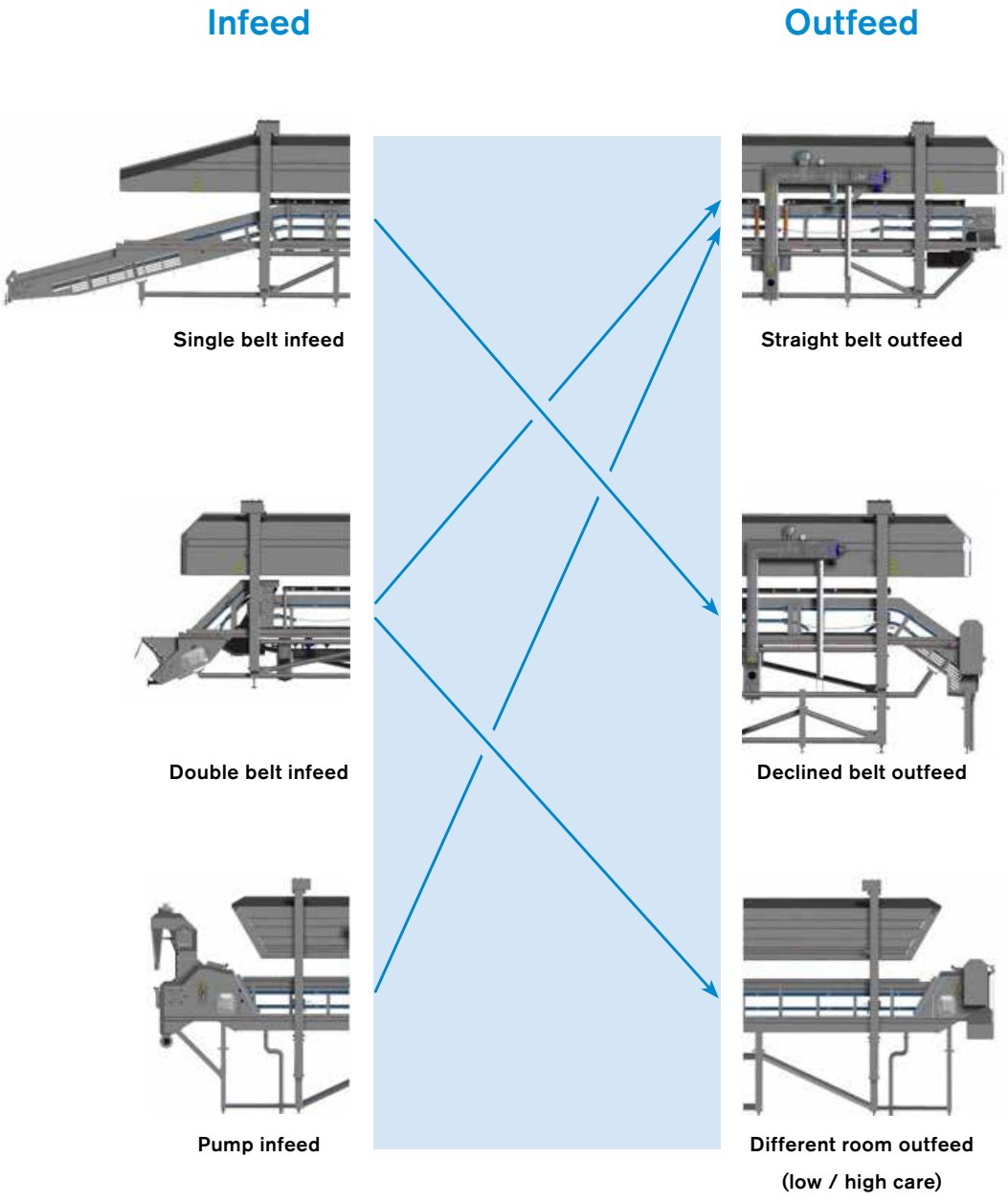
The primary purpose of steaming is to improve shelf life. Furthermore, it is possible to improve the organoleptic properties, like taste, bite, smell and texture. Additional applications are:

- Inactivation of enzymes
- Inactivation of bacteria
- Compression of cooking time
- Improvement of product quality
- Gelatinization of starch
- Sanitizing / Disinfection
- Thawing

Steaming in relation to Blanching

- No need for heating up process water
- In case of steaming, colour, aroma, flavour, vitamins etc. are often retained. In case of blanching/cooking they may be lost in the process water.
- Steaming is often used for vegetables, which do not need to absorb water.

Type of Belt Steamers



All infeed and outfeed types can be combined

Infeed section

The product is fed onto the belt of the steamer. The infeed system should ensure an evenly spread product layer over the whole width of the belt.

Following infeed systems are possible:

- Single belt infeed
- Double belt infeed
- Pump infeed

Single belt infeed

With this infeed system a single belt runs through the complete DCC steamer. The belt starts at an optimum infeed level, and runs upwards into the steaming chamber. From this point the belt runs horizontally to the outfeed. With this construction, there is no transfer point which could create product spillage or product damage. It also means that the DCC systems needs to be fed in a constant flow, properly spread over the full width. The infeed section is covered by the insulated hood from the DCC chamber.

Double belt infeed

With this system, the infeed is effected by a separate belt. The belt which runs through the DCC steaming chamber is another belt with its own drive. The infeed belt starts at an optimum infeed level and has a small hopper. It runs upwards at ± 45 degrees into the steaming chamber. The belt is provided with flights with a height of 100 mm / ± 3.9". It is driven by its own motor gearbox combination.
A chain connection is mounted between the drive shaft and the motor gearbox combination to be able to install the motor underneath the steam cloud. The infeed section is covered by the insulated hood from the DCC blancher.

Pump infeed

With this infeed system the product is brought from a Vortex tank into the DCC steam chamber by a food pump system. Via a retarder, the product with water is brought fully spread over the width of the DCC steamer belt. The water runs through the belt and is collected to be fed back to the Vortex tank. A hingeable plate is installed between the product infeed section and the DCC chamber in order to ensure that a minimum amount of water is going into the DCC chamber.
The infeed section is fixed installed at the frame work. The liftable hood from the DCC chamber encloses the infeed section and is sealed by silicone seal.

DCC chamber

The product is transported through the DCC chamber with a SS304 Eyelink belt, driven by a motor gearbox combination. The complete belt support structure is made of SS304 sheet material to be very hygienic. All plastic parts can be easily removed for maintenance. Steam is distributed over the complete surface of the steam chamber by a specially calculated pipe distribution system. The steam amount is controlled by a PID control valve.

The steam control system (hardware) includes:

- Main steam pipe, with flange connection (stainless steel)
- Manual valve (cast iron)
- Steam filter (cast iron)
- PID Steam control valve (cast iron)
- Temperature probe PT100 2 pcs (stainless steel)
- Steam pressure reducer (cast iron) - Reduction from max. 8 bar to 3 bar / 116 Psi to 43.5 Psi.

Example of the DCC Belt steamer, type single belt system. In the right figure the hood is in cleaning position. The inner side of the hood and the whole belt are easy accessible for cleaning.

Protection steam line, behind screen

The steam system is protected by SS304 perforated plates, which are mounted around the steam street with the help of distance pins.

Collection of condensate

Condensate which occurs during the process is collected at the bottom of the DCC chamber and is fed to the drain. Condensate from the hood is guided to the side and fed to the drain via the outside of the DCC steamer. This ensures that no condensate will come on the product. Via a PT100 the steam cloud is measured and controlled.

Outfeed section

After the steaming process, following outfeed systems are possible:

- Straight belt outfeed
- Declined belt outfeed
- Different room outfeed

Straight belt outfeed

With this outfeed the belt from the DCC chamber runs straight into the outfeed chute. A scraper cleans the belt. The outfeed section is connected to the liftable hood from the DCC chamber.

Declined belt outfeed

With this outfeed system the belt from the DCC chamber runs down at 30 degrees till underneath the steam cloud. The belt is cleaned by means of a spray bar connected to fresh water. This outfeed ensures a good belt cleaning for sticky products, like spinach or herbs. This outfeed is suitable for products for which the falling height could cause damage.
The outfeed section is connected to the liftable hood from the DCC chamber.

Different room outfeed

In case the DCC steamer needs to feed the product into a different room, the liftable hood cannot be used on the outfeed section. For this reason, the outfeed section will get a fixed hood connected to the liftable hood from the DCC chamber by a silicone seal. The outfeed section is crossing the wall between the low and high care area. The pressure difference between both areas should be minimized.

Example of the DCC Belt steamer, type double belt system. In the right figure the hood is in cleaning position. The inner side of the hood and both belts are easy accessible for cleaning.

Products suitable for steaming

Vegetables - cauliflower, broccoli, bell peppers, green peas, zucchini, carrots etc.

- Potatoes - whole, sliced and sweet potatoes
- Herbs - (pre-cut) basil, parsley etc.
- Fruit - sanitizing tropical fruits
- Fish - tuna filet
- Meat - meat balls, burgers

Technical specifications

Effective width Steam chamber

It is possible to choose an effective width of the Steam chamber of 1,000 mm / 39", 1,500 mm / 59" or 2,000 mm / 79".

Effective length Steam chamber

It is possible to choose an effective length of the Steam chamber of 3,000 mm / 118" to 10,000 mm / 394".

Belt

Mesh wire belt SS304, Eyelink

- Option: Wire mesh belt SS 304, with flights
- Option: Wire mesh belt SS 304 without flights
- Option: Wire mesh belt SS 304, flattened
- Option: Belt with stainless steel top wires

Belt drive

Motor and gearbox combination, inverter controlled, with stainless steel 304 cover

Belt cleaning

Scraper and/or spray bar

Belt frame

Sheet material, stainless steel 304

Support frame

Hollow section tubing, stainless steel 304

Body Steam chamber

Stainless steel, sandwich construction with Rockwool insulation.

Delivery including

Pre-cleaning system for belt – Single belt infeed

Product sticking to the belt is rinsed off, using fresh water. A spray bar is mounted in-between the belt at the incline section.

Pre-cleaning system for belt – Double belt infeed

Product sticking to the belts rinsed off, using fresh water. Two spray bars are mounted in-between the belts. One at the infeed conveyor, one at the steaming conveyor.

Pre-cleaning system for belt – Pump infeed

Product sticking to the belt is rinsed off, using fresh water. A spray bar is mounted in-between the belt at the incline section.

Options

Belt with flights

In case of a Double belt infeed system. The belt is provided with flights with a height of 100 mm / ± 3.9". It is driven by its own motor gearbox combination.

Belt without flights

In case the main product is f.e. pre-cooked pasta, or pre-cooked rice, a belt without flights will be applied. A stainless steel 304 mesh wire Eyelink belt takes the product from the hopper and transports it upwards. The belt is driven by a motor and gearbox combination (inverter controlled) and discharges via a transfer chute directly onto the belt steamer.

Wire mesh belt SS 304 flattened

In case the main or sub product is small, like f.e. pre-cooked rice, a flattened, stainless steel 304, Eyelink belt with smaller openings will be applied.

Belt with stainless steel top wires

In case the main or sub product is round, like f.e. green peas, an Eyelink belt with small stainless steel wires on top of the mesh wire belt will be applied to ensure product transport.

Platform, closed style

To improve operator access, a platform is positioned on one or two sides of the belt steamer. The platform consists of a stainless steel frame and a fully welded stainless steel checker plate deck on top. The platform comes complete with railing and staircase.

Platform, open style

To improve operator access, a platform is positioned on one or two sides of the belt steamer. The platform consists of a stainless steel 304 frame with an open glass fibre reinforced grating on top. The platform comes complete with railing and staircase.

Controls

The control system is equipped with a PLC with touch screen. The touch screen is integrated into the control panel door and allows to access the steamer settings. The actual process parameters are displayed on screen. All cables runs through stainless steel rings to avoid unnoticed debris accumulation.

The controls include:

- Main power switch
- Emergency stop (1 on the panel, 2 on machine)
- VFD for the conveyor(s)
- Automatic steam control by PLC
- Automatic hood lifting by DOL
- Display of actual retention time in minutes/seconds
- Display of actual temperature
- Manual, Auto and Cleaning mode
- Alarms
- Recipes (100)
- Multiple clearance levels possible (operation, PID settings)

Safety

Safety pull cord along both sides of the steamer.

Important

The infeed side and the outfeed side of the machine have to be placed in one room, where the pressure is the same.

Air movement will disturb the steam cloud and therefore the steaming process. This means that air movement around the machine should be eliminated. Otherwise it is not possible to guarantee the steaming process.

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