

Citrus Processing Lines



Simplicity of design...

Features and benefits of JBT FoodTech's citrus processing system

Simplicity of design

Since less processing equipment is required for the JBT FoodTech system, the processor's overall operating efficiency is improved, operational problems are reduced, and capital costs are kept to a minimum. The fruit sizing requirements of the JBT FoodTech extractor are less rigid than those of reamer-type extractors; therefore, less sizing space is required and higher extraction productivity is achieved.

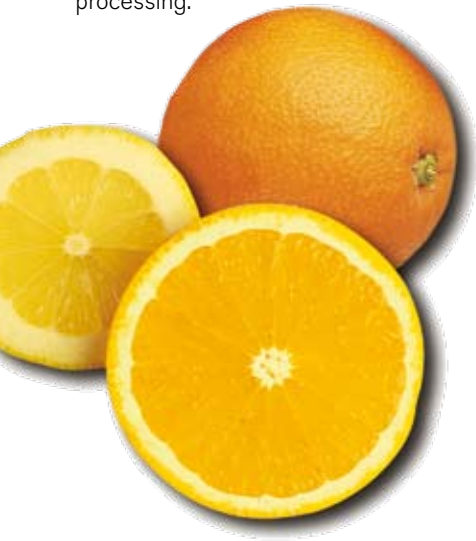
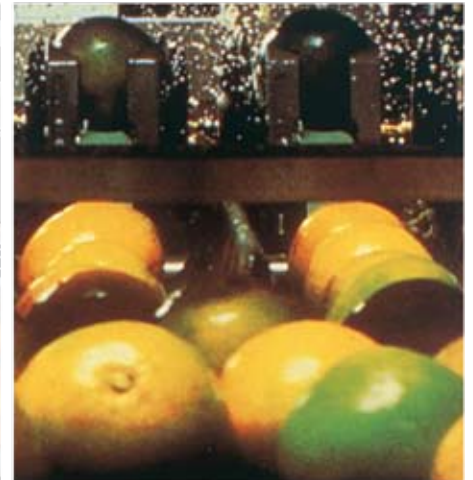
High juice quality

JBT FoodTech's principle of instantaneous separation of the juice from the peel, membrane material, and seeds is the major reason for the superior quality juice delivered by the JBT FoodTech citrus juice extractor. The whole fruit principle of squeezing the fruit minimizes peel contact with the juice, virtually eliminating peel extractives from entering the juice.

Sanitary control

JBT FoodTech's use of stainless steel for all the juice contact surfaces as well as the totally enclosed juice handling system provides processors with the key to complete sanitary control of your juice product.

This exclusive feature ensures a high level of sanitation and protects your juice from airborne contamination right from the moment of extraction and all the way through to thermal processing.



... high quality and greater yield

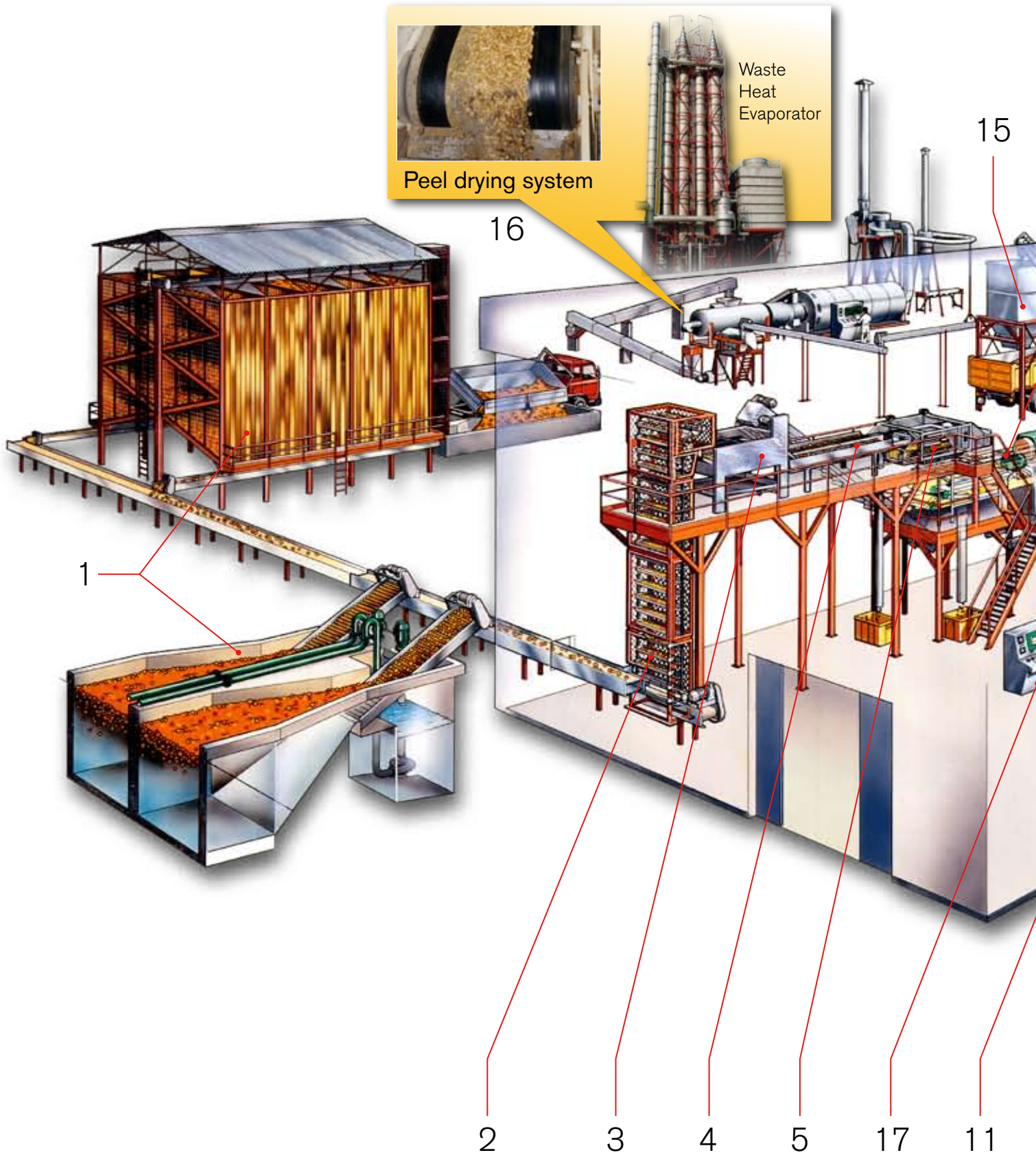


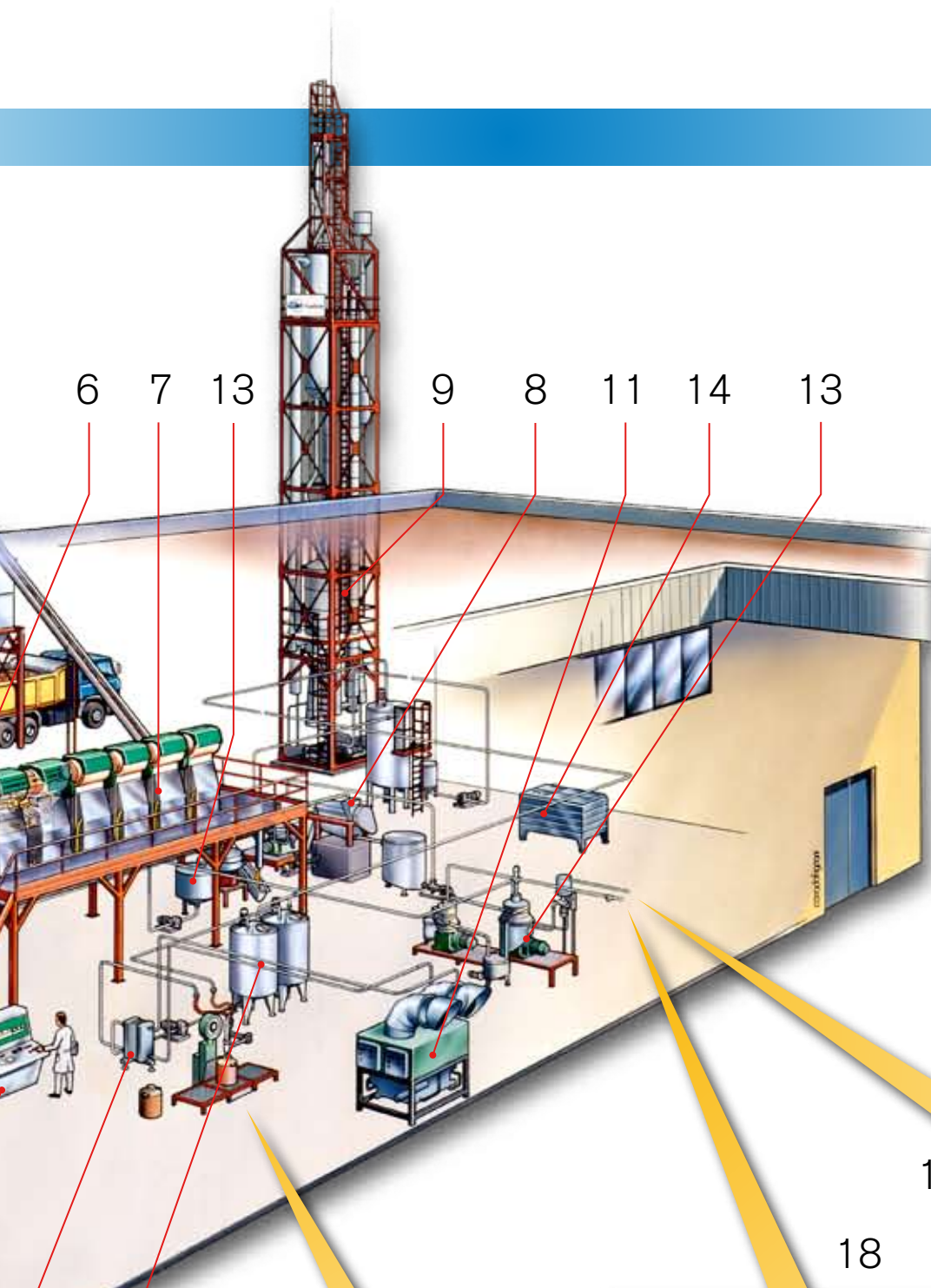
Worldwide sales and service operations

JBT FoodTech provides vital help at every stage in the process with people, advice, technology, products, and systems that flow from unmatched JBT experience. Our specialists are found in strategic locations around the world. Our commitment and our extensive experience enable JBT FoodTech to make unique contributions to the global citrus industry.



Citrus Processing System





Deaerator and Deoiler



Pasteurizer



Aseptic Tanks Farm
NFC capabilities

19

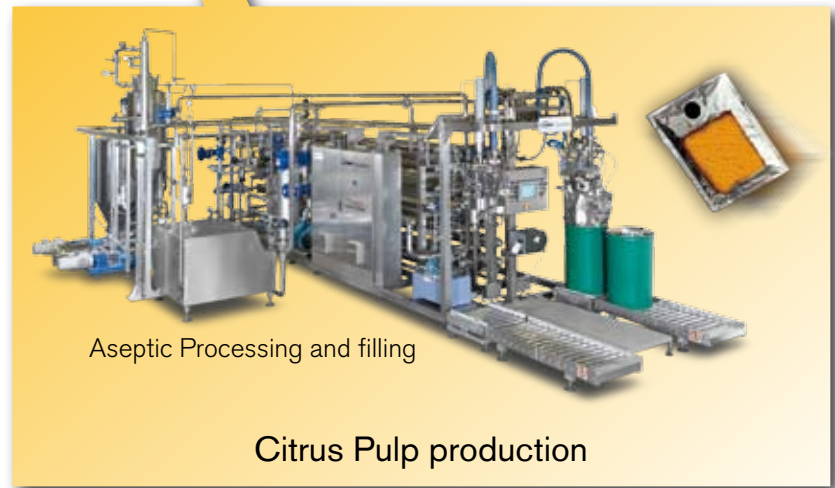
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Aseptic Processing and filling

Citrus Pulp production

We're with you...

1 Fruit unloading

Citrus fruit may be unloaded either via dry or with water-flume systems. The dry system includes aerated silos with sloping planes on which the product is placed in layers to protect the integrity of the fruit. The water system involves large concrete tanks at ground level; the product is discharged directly into these tanks from the truck, and moved by means of water circulation which conveys the product to a special elevator.

2 Transfer system

The transfer system consists of a set of conveyor belts that transfer the fruit from the storage bins to a bucket elevator prior to entering the juice extraction area.

3 Brushwashing

The brushwasher is designed to help clean the exterior of the fruit from materials that otherwise might contaminate the juice and the essential oils.

4 Fruit grading

JBT FoodTech grading tables are designed in order to allow a more efficient removal of foreign materials and fruit that is unsuitable for extraction due to injury.

5 Fruit sizing

In this stage the fruit is separated according to the sizes that best match the cups of the Citrus Juice Extractors so as to achieve the optimal quality and juice yield. Sizing is obtained by rotating the fruit along belts by a series of rotating horizontal rollers, which can easily be adjusted during operation.

6 Fruit feeding

After sizing, the fruit is conveyed to the hoppers of the Citrus Juice Extractors by means of a tilted feed belt conveyor equipped with the appropriate diverters. The tilted feed belt is set up at the appropriate angle to promote proper fruit feeding to the extractor regardless of fruit shape. Excess fruit is redelivered to the grading table by means of a return fruit conveyor.

7 Citrus juice extraction

Fruit delivered from the tilted feed belt conveyor is fed into the extraction cups singly. Fruit drops into a stationary lower cup which automatically centers and positions it for extraction. The upper cup descends, and as the metal fingers of the two intermesh, pressure is applied evenly to all surfaces of the fruit. The bottom of the lower cup contains a cutter leading to the pre-finishing or strainer tube and juice manifold. The cutter cuts a small circular plug in the bottom of the fruit. As pressure is applied by the cups, the complete interior of the fruit is pressed into the strainer tube where the juice and juice cells are instantaneously separated from the seeds and section membrane. As a result, only pure juice and juice cells are discharged into the juice manifold.

8 Finishing

The various JBT FoodTech finisher types - screw, paddle, or hybrid models - efficiently remove pulp and/or juice sacs from the juice by using stainless steel screens with small perforations. The juice coming from the extractors is then collected by a stainless steel juice header and then conveyed to the finisher. The finisher has been developed to extract juice from products having a low fiber or pulp content. Further pulp reduction can be obtained by means of centrifugal separator or clarifier, though this is not generally necessary. Separate automated systems are available to:

- control the quick fiber of the juice by automatically controlling air pressure based upon juice flow to the finisher;
- unblind the finisher screens by means of a high pressure water spray.

9 Evaporation

Juice concentration up to 65° Brix is obtained in the JBT FoodTech TASTE Evaporator in a total cycle time of 2½ minutes. The basic advantage of the «THERMALLY ACCELERATED SHORT TIME EVAPORATION» technology is that at each evaporation stage the juice is introduced into the tube nest in the form of a turbulent fog, enabling a much faster and higher heat transfer than would be expected under any other conditions. The juice flows from one stage to the next without recycling. The initial juice evaporation occurring before pasteurization ensures better juice deaeration and a more efficient stripping of fresh aromas. The best quality of the product is preserved only when deaeration, aroma recovery, pasteurization, stabilization, concentration, and cooling are performed in an extremely short time. The evaporator can also be equipped with an aroma recovery system where the aromas are extracted from the juice and concentrated 150 times before pasteurization, thereby avoiding any alteration to the freshness of the aromas due to heat. Before leaving the evaporator, the concentrated juice passes through a flash cooler which drops the temperature to 10°C.

... right down the line™

10-11 Cooling system for concentrated juice

The concentrated juice leaving the evaporator is delivered to a standardizing and refrigerating system prior to filling. This system consists of two stainless steel tanks for Brix standardization and a storage unit from which the product is pumped through a plate-type heat exchanger. In the heat exchanger the juice is cooled down to a very low temperature by means of glycolate water supplied by a chilling unit.

12 Drum filling

The concentrated juice is accurately and reliably filled into drums by means of a controlled system with preset weight scales.

13 Finishing system for essential oils

This system consists of a special JBT FoodTech finisher or a vibrating screen to separate the oily emulsion from peel fragments. The resulting emulsion is then fed to a two-stage centrifugation system. A desludging centrifuge removes the suspended solids and concentrates the oily emulsion into a cream and then the polishing centrifuge completely separates the essential peel oil from other liquid phases.

14 Cleaning in place (CIP)

This system allows washing and sanitization of all parts coming into contact with the product. A special system of tanks, piping and high pressure pumps allows dissolution and semiautomatic distribution of sanitizing agents to the various machines.

15 Peel collection

A special system of screw conveyors takes the citrus peel as well as waste pulp and membrane material to a dedicated silo with a capacity of approximately 12 cubic meters. Here the waste material can be directly discharged onto a truck or conveyed to the peel drying system for further processing.

16 Peel drying system

Peel drying systems are designed to reduce peel moisture content from the initial 82% to a final 8%; this allows the peel to be preserved after its volume has been reduced without altering its nutritional value as animal feed. This system includes a hammer mill, a neutralizing tank with lime dosing capabilities, a pressing unit, a rotary drum drier complete with combustion chamber and cooler for dried peels, a centrifugal dust separator, and a product filling system. An optional pellitizer is also available.

Waste Heat Evaporation: the air vapor mixture coming from the peel drier is separated from the powders then conveyed to the JBT FoodTech waste heat evaporator to be used as a source of energy to concentrate the liquor coming from the pressing stage. Exploiting the vapors coming from the drier, the waste heat evaporator provides huge energy savings over alternative systems where the peels are fully dried solely by means of hot air. Additionally, the waste heat evaporator can also recover residual oils contained in the peels in the form of d-Limonene.

17 Control system

This unit is designed to assist the operator in keeping all the key operational parameters under control with minimal manual intervention.

18 Aseptic Processing and Filling

READYGo™ "COMPACT" monoblocs are available with capacities ranging from 500 to 6000 kg/h. They are designed for the aseptic filling of 5 to 200 liter bags and can process the following products: fruit purees with or without pieces, concentrated fruit purees, and many other formulated products. The suitable configurations and type of heat exchangers are selected as a function of the product to be processed in order to guarantee the best qualitative result.

19 Not-from-Concentrate capabilities

The JBT FoodTech extractor can be equipped with special juicing components which reduce the presence of peel oil and other negative attributes in the juice for optimal not-from-concentrate (NFC) production. After extraction, the finished and chilled juice is fed to an aseptic processing system consisting of a tube-in-shell Dimple Tube™ sterilizer with optional direct product-to-product heat recovery. A specially designed flash deaerator for aroma recovery and oil separation, as well as an independent CIP tank and associated piping, are also part of the system. Sterilized juice is then pumped into bulk storage tanks (built in partnership with Enerfab Inc.) with a capacity of up to 2 million gallons each. The stored juice can then be exported directly to filling lines with optional blending and aseptic flavor injection systems or to tankers for transport to other destinations. Citrus pulp cells can also be aseptically added to the finished juice prior to filling with an aseptic monobloc pulp injection system.



Solutions provider

JBT FoodTech is a leading supplier of integrated food processing solutions.

From single machines to complete processing lines, we enhance value and capture quality, nutrition and taste in food products.

With a local presence on six continents, JBT FoodTech can quickly provide customers and partners in the food processing industry with the know-how, service, and support required to succeed in today's competitive marketplace.

Part of the technology presented in this brochures is patented. JBT FoodTech, whose policy is to continuously improve its products, reserves the right to discontinue or change specifications, models or design without notice and without incurring obligation.



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