Tomato & Fruit Processing System

Tomato Processing: Paste and Concentrate Line

TOMATO PREPARATION

RECEIVING | WASHING | SORTING | CHOPPING → HOT/COLD BREAK → REFINING

General Planning Information*

Identify the:

- *Hours per day of harvest*
- *Hours per day of processing*
- *Length of the operating season*
- *Plans for additional capacity*
- *Customers/Markets for each end product*

Local electricity cost per kW/hr.

Local steam generation cost/kg. or lb.

Plant or floor space constraints

Special circumstances or issues

**Separate information is required for each product on this equipment line.*

Receiving, Washing, Sorting & Chopping

Tomatoes are delivered to the plant and transferred to flumes through manual, mechanical or hydraulic means. Tomatoes are conveyed through the flumes to the washing and sorting area. Field material is removed from the tomatoes and then manual or electronic systems sort the product.

Equipment & Process Planning Variables:

- Fresh tomato capacity of the plant
- Harvesting methods
  Hand
  Mechanical (type)
- Delivery methods
  Baskets or boxes
  Bins
  Gondolas
- Sorting
  Manual
  Electronic
- Input into the break process
  Chopped
  Whole tomatoes.

Hot/Cold Break

This procedure provides even heating that inactivates the natural enzymatic process.
The choice of hot or cold break depends on the final product to be obtained.

Equipment & Process Planning Variables:

- Input into the break process
  Chopped
  Whole tomatoes
- End Products
  Soup
  Juice
  Concentrate
- Customer requirements for end products
  Color
  Texture
  Consistency
  Flavor
  Yield
- Processing below or above 180°F/82°C.

Juice Refining

The juice is refined by removing the peel, and seeds from the pulp. This step results in juice that is ready for concentration.

Equipment & Process Planning Variables:

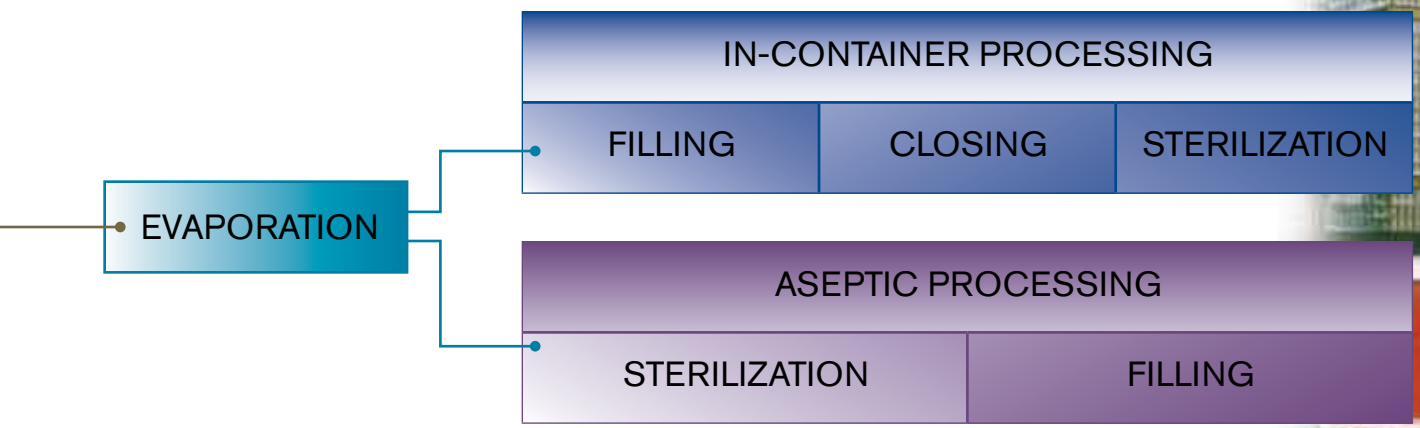
- Screen sizes
- Tonnage or product flow rate (gpm/lpm).

Evaporation

The highest quality paste is obtained by removing the water while preserving the color and organoleptic properties of fresh tomatoes.

Equipment & Process Planning Variables:

- Lowest anticipated incoming % solids
- Highest anticipated discharge product % solids
- Preferred discharge temperature range
- Break process used
- Boiler capacity, pressure, available volume.



In-Container Filling, Closing and Sterilization

Containers are filled with paste, enter a closing machine where a lid is seamed to the can, then they are conveyed to a cooker where the product is heated to sterilization temperature, held, cooled and made ready for warehousing.

Equipment & Process Planning Variables:

- Container types
- Container sizes
- Required cpm
- Minimum initial product temperature
- Maximum final shaken and unshaken product temperatures
- Preferred heating medium
  Steam
  Water
- Cooling water source and temperature range
  Ground water
  Cooling tower
  Chilled.

Aseptic Sterilization and Filling

Quality improves when commercial sterility can be obtained with minimal heat damage. In a closed system tomatoes are heated, held at temperature to obtain commercial sterility, and aseptically cooled to ambient temperature. The sterilized paste is then filled into aseptic bags. 300 gallon/1000 liter bags are filled in a box. 55 gallon/200 liter bags are either filled flat and then placed in a drum, or filled directly inside the drum. Drums or bins are labeled and ready for shipment and/or storage at ambient temperatures.

Equipment & Process Planning Variables:

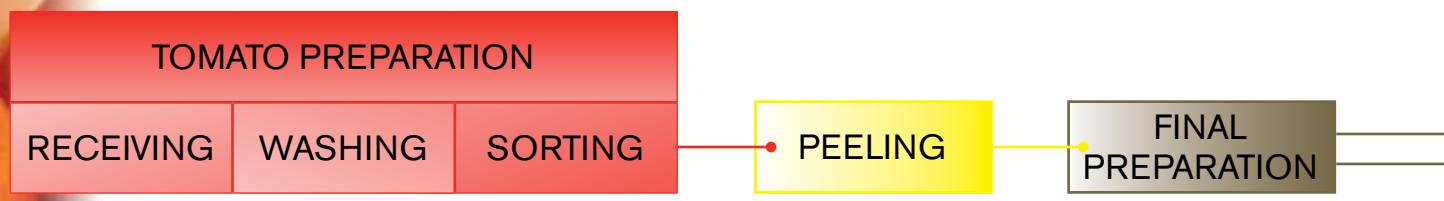
Infeed to Sterilizer

- Product feed temperature
- Product sterilization process
- Product filling temperature
- Product flow rate (gpm/lpm).

Filler Discharge

- Type(s) and size(s) of outer container(s)
  Drums
  Bins
  Other
- Ambient storage temperature range.

Tomato Processing: Peeled Products



General Planning Information*

Identify the:
- *Hours per day of harvest*
- *Hours per day of processing*
- *Length of the operating season*
- *Plans for additional capacity*
- *Customers/Markets for each end product*

Local electricity cost per kW/hr.

Local steam generation cost/kg. or lb.

Plant or floor space constraints

Special circumstances or issues

**Separate information is required for each product on this equipment line.*

Receiving, Washing & Sorting

Tomatoes are delivered to the plant and transferred to flumes through manual, mechanical or hydraulic means. Tomatoes are conveyed through the flumes to the washing and sorting area. Field material is removed from the tomatoes and then manual or electronic systems sort the product.

Equipment & Process Planning Variables:

- Fresh tomato capacity of the plant
- Harvesting methods
  Hand
  Mechanical (type)
- Delivery methods
  Baskets or boxes
  Bins
  Gondolas
- Basic Sorting
  Manual
  Electronic.

Peeling

Lye, steam and/or hot water is used to separate skins from the whole tomato. Scrubbers and/or pinch bed systems finish the peeling process. Usable by-product is often recovered from the non-lye processes for concentrate and/or topping media.

Equipment & Process Planning Variables:

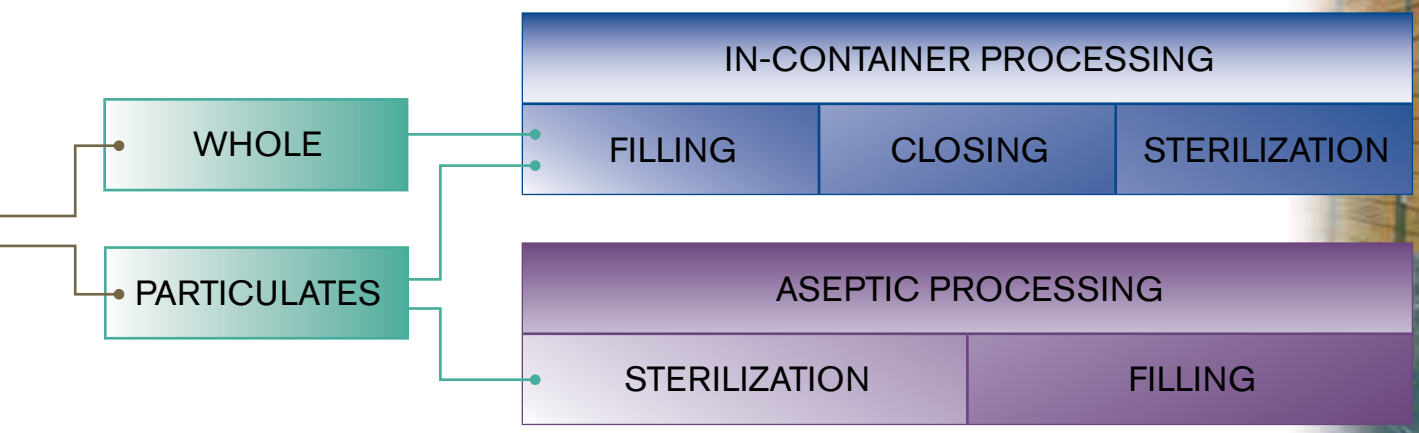
- Importance of by-product recovery.

Final Preparation

After peeling, tomatoes are again sorted, graded and directed toward final preparation. As tomatoes are directed toward final processing they either remain whole or are cut and reduced in size. Calcium chloride is an option used in certain regions to maintain the shape and firmness of cut tomatoes.

Equipment & Process Planning Variables:

- Infeed Sorting & Grading
  Manual
  Electronic
- Particulates
  Slice
  Wedge
  Crush
  Dice
  Other.



In-Container Filling, Closing and Sterilization

Whole tomatoes or tomato particulates are conveyed to a filling machine that is typically designed for cans or jars.

Juice is added to the container before it enters a closing machine where a lid is attached and hermetically sealed. The closed containers are conveyed to a sterilizer where the product is heated, held, cooled and made ready for labeling and warehousing.

Equipment & Process Planning Variables:

- Container types
- Container sizes
- Required cpm
- Minimum initial product temperature
- Maximum final shaken and unshaken product temperatures
- Preferred heating media/process
  Steam or water
  Atmospheric or pressure
- Cooling water source and temperature range
  Ground water
  Cooling tower
  Chilled
- Closing or other equipment compatibility issues.

Aseptic Sterilization and Filling

Quality improves when commercial sterility can be obtained with minimal heat damage. In a closed aseptic system, particulate tomatoes in a carrier media are heated, held at temperature to obtain commercial sterility, and aseptically cooled to ambient temperature. The sterilized particulates are then filled into aseptic bags. 300 gallon/1000 liter bags are filled in a box.

55 gallon/200 liter bags are either filled flat and then placed in a drum, or filled directly inside the drum. Drums or bins are labeled and ready for shipment and/or storage at ambient temperatures.

Equipment & Process Planning Variables:

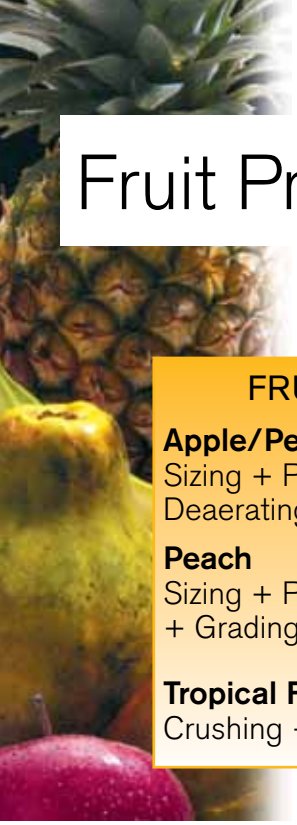
Infeed to Sterilizer

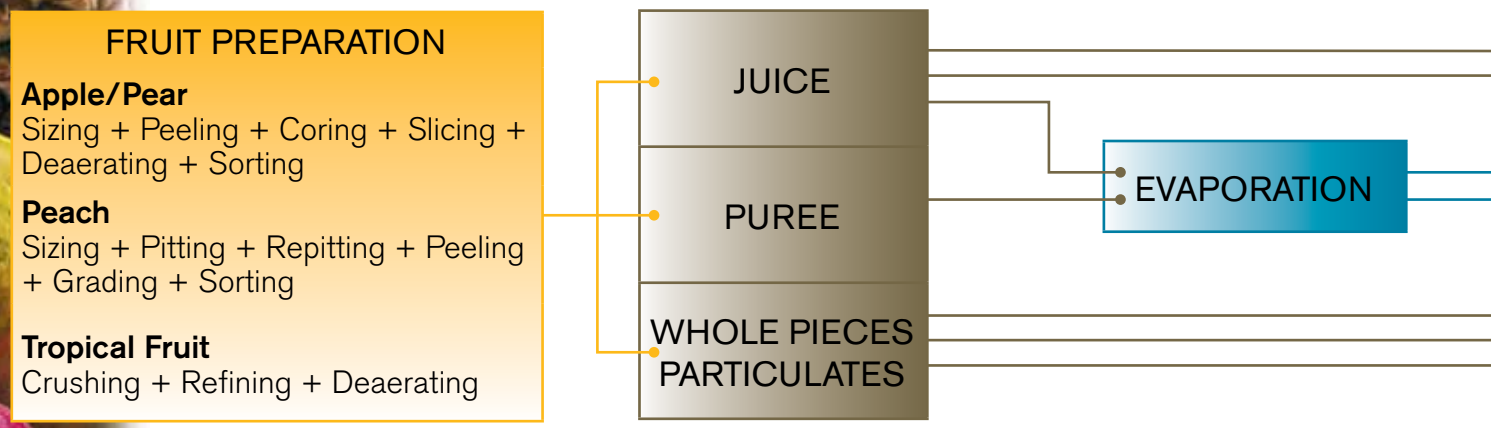
- Product feed temperature
- Product sterilization process
- Product filling temperature
- Product flow rate (gpm/lpm).

Filler Discharge

- *Type(s) and size(s) of otter container(s)*
  Drums
  Bins
  Other
- *Ambient storage temperature range.*

Fruit Processing: Continental & Tropical - Juice,





General Planning Information*

Identify the:
- *Hours per day of harvest*
- *Hours per day of processing*
- *Length of the operating season*
- *Plans for additional capacity*
- *Customers/Markets for each end product*

Local electricity cost per kW/hr.

Local steam generation cost/kg. or lb.

Plant or floor space constraints

Special circumstances or issues

**Separate information is required for each product on this equipment line.*

Receiving, Washing, Grading, Preparation & Sorting

Fruit is delivered to the plant and transferred to flumes or conveyers through manual, mechanical or hydraulic means.

Fruit is conveyed to the washing and sorting area. Field material is removed from the fruit and then the product is initially sorted by manual or electronic systems.

The appropriate combination of preparation processes depends on the type of fruit to be processed and whether the end product includes juice, particulates, whole pieces or puree. Typically, fruit preparation includes a combination of peeling, coring, pitting, repitting, crushing, slicing, deaerating and refining as well as additional grading and sorting.

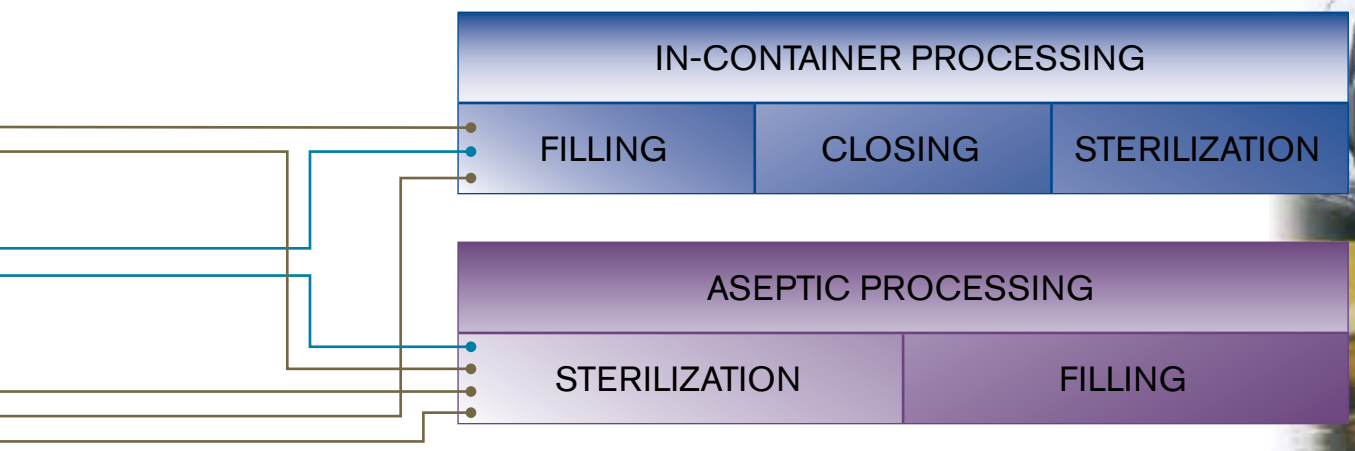
Equipment & Process Planning Variables:
- Fresh fruit capacity of the plant
- Harvesting methods
  Hand
  Mechanical (type)
- Delivery methods
  Baskets or boxes
  Bins
  Gondolas
- Basic Sorting Manual Electronic
- Type(s) of Fruit
- Preparation Processes
  Peeling
  Coring
  Pitting/Repitting
  Crushing
  Slicing
  Deaerating
  Refining
  Additional grading and/or sorting.

Evaporation

Water is removed from the juice stream to concentrate the product. The specific evaporation method to be used depends on the desired final product. The highest quality is obtained by removing the water while preserving the color and organoleptic properties of the fresh fruit.

Equipment & Process Planning Variables:
- Lowest anticipated incoming % solids
- Highest anticipated discharge product % solids
- Preferred discharge temperature range
- Products being concentrated
- Desired Finishes
  Coarse
  Fine
  Clarified
  Custom
- Boiler capacity, pressure and available volume.

Puree & Pieces



In-Container Filling, Closing and Sterilization

Fruit and juices are conveyed to the appropriate types of filling machines where containers are filled at predetermined ratios. The container then enters a closing machine where a lid is attached and seamed to the can. Closed containers are conveyed to a cooker where the product is heated to sterilization temperature, held, cooled and made ready for labeling and warehousing.

Equipment & Process Planning Variables:

- Container types
- Container sizes
- Required cpm
- Minimum initial product temperature
- Maximum final shaken and unshaken product temperatures
- Preferred heating media/process
  Steam or water
  Atmospheric or pressure
- Cooling water source and temperature range
  Ground water
  Cooling tower
  Chilled
- Closing or other equipment compatibility issues.

Aseptic Sterilization and Filling

Quality improves when commercial sterility can be obtained with minimal heat damage. In a closed aseptic system the fruit is heated, held at temperature to obtain commercial sterility, and aseptically cooled to ambient temperature. Certain fruits are cooled and/or stored below ambient temperatures to inhibit chemical changes which affect appearance. The sterilized product is then filled into aseptic tanks or aseptic bags. 300 gallon/1000 liter bags are filled in a box. 55 gallon/200 liter bags are either filled fiat and then placed in a drum, or filled directly inside the drum. Drums or bins are labeled and ready for shipment and/or storage at ambient temperatures.

Equipment & Process Planning Variables:

Infeed to Sterilizer

- Product feed temperature
- Product sterilization temperature
- Product filling temperature
- Product flow rate (gpm/lpm)

Filler Discharge

- Type(s) and size(s) of outer container(s)
  Drums
  Bins
  Other
- Ambient storage temperature range.

Corporate Social Responsibility at JBT

We are your single source for profitable processing solutions

JBT is a leading provider 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 can quickly provide our customers and partners in the food processing industry with the know-how, service, and support needed to succeed in today's competitive marketplace.

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