MachinePoint
Food Technologies

Tomato processing

Tomato paste, concentrate, tomato sauce, ketchup

Diced and peeled tomatoes

MachinePoint
Industrial Machinery Experts



Your partner for tomato processing

Used and eaten in all different types of preparations all over the world, tomato is a key ingredient in many cuisines in America, Middle East, Europe and Africa. In such a context, tomato processing has turned to be one of the biggest processing industries in the food market

Tomatoes can be processed into different types of end products like tomato sauce, tomato juice, tomato paste, tomato pulp, peeled tomatoes, diced tomatoes, ketchup, and many others.

Nowadays tomatoes processors are growing with the aim of automating and industrializing the processing by mechanical systems and control structures.

Since tomato season lasts only 60 to 100 days, depending on climatic conditions and type of tomatoes, tomato processing plants need to run continuously during this period. Efficient and reliable machinery is needed to handle production and product quality. Our engineering center is located in one of the biggest agricultural areas in Europe and it has over 25 years' experience developing processing solutions in the food and beverage industries.

MachinePoint Food Technologies customizes each tomato plant to each customer's needs depending on product, capacity, requirements and budget. Our lines are manufactured following the latest market trends to fulfill the most demanding requirements from our customers around the world.

We offer processing lines for following products:

- Tomato concentrate
- Tomato sauce
- Ketchup
- Peeled tomatoes
- Diced tomatoes

Our equipment and lines include:

- Tomato reception area, including tomato washing, sorting and leaf removing
- Peeling lines
- Chopping technologies
- Dicing lines for the production of diced tomatoes
- Refining
- Hot and cold breaking technologies
- Evaporation
- Sterilization
- Aseptic filling
- Filling and packaging lines in aseptic, hot filling, canned or other packaging technologies
- Ancillary equipments and services: cooling tower, water filtration and CIP systems

International standards for design and quality

Our equipment designs and construction follow the best manufacturing practices and hygienic design principles, achieving strict standards, following EU and international regulations for equipment design and fabrication, including CE-approval, and 3-A SSI Certification.

Also our equipment and process design comply with production and energy efficient requirements.

Great quality / price relationship

We have a unique business model where our clients can get a complete production solution with a great price / quality relationship, thanks to our capacity to integrate used machinery into our projects. Supported by our sister company MachinePoint Used Machinery, we can include in our projects reliable and affordable top brand and high quality second hand machinery.

Leadership in innovation

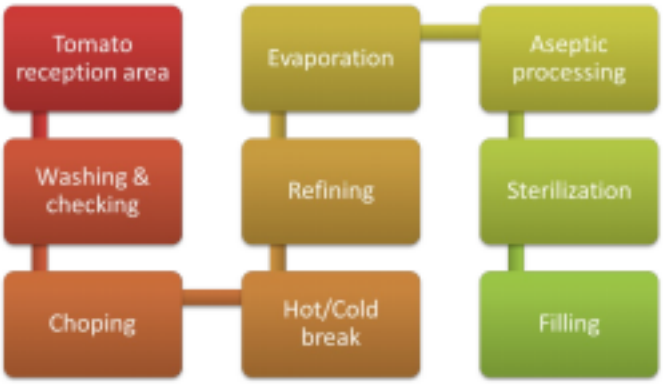
We are aware that keeping ahead with technological innovations is key to being competitive; in order to satisfy our customers' requirements MachinePoint Food Technologies R&D department is always looking for new technologies, developing processes and equipment alternatives.

Our range of brand new equipment includes pasteurizers, sterilizers tomatoes reception, Hot break and cold break,, product recovery system to reduce product loses during production, aseptic product storage systems, and more.

Defining the right manufacturing process

Tomato paste / concentrate

This is the largest of the tomato processing industries, because tomatoes are seasonal and industrial preservation is necessary to maintain its usage throughout the year. Tomatoes are cultivated all year round in green houses; although mainly for fresh distribution.



After the washing, grading and the preliminary crushing process, tomatoes are milled and then chopped before the enzymatic inactivation process. Hot break technology, is the one used for tomato concentrate as it produces a sauce with higher viscosity, and it quickly deactivates the enzymes, hence preventing the loss of viscosity. Forced circulation evaporators are used to reach concentrations of 30 to 32 brix. The concentrate is then pasteurized using high pressure tube exchangers.

The pasteurized tomato concentrate paste is usually packed in packaging of 200 lt. sizes; in aseptic bags, metal drums or cardboard boxes. Under such conditions, concentrate can be conserved at room temperature. It can be distributed and processed throughout the rest of the year.

Tomato Sauce

Most of tomato sauce comes from tomato concentrate. This industry is a whole industry on its own.

Concentrate is mixed with water, spices, flavor, or even vegetables and meat. Recipes vary tremendously upon regional tastes. Mixing systems can be either batch or continuous. The mixing process varies greatly upon each recipe.

Following, the product needs the adequate thermal treatment, pasteurization or sterilization. Finally the sauce is filled and packed in aseptic, in hot fill, or other technologies.

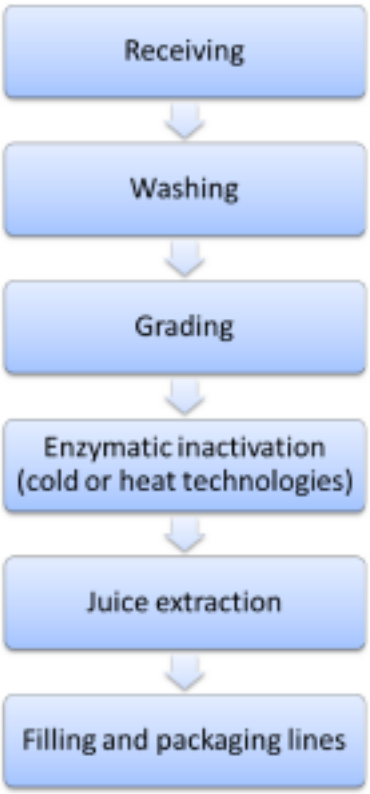
Diced and peeled tomatoes

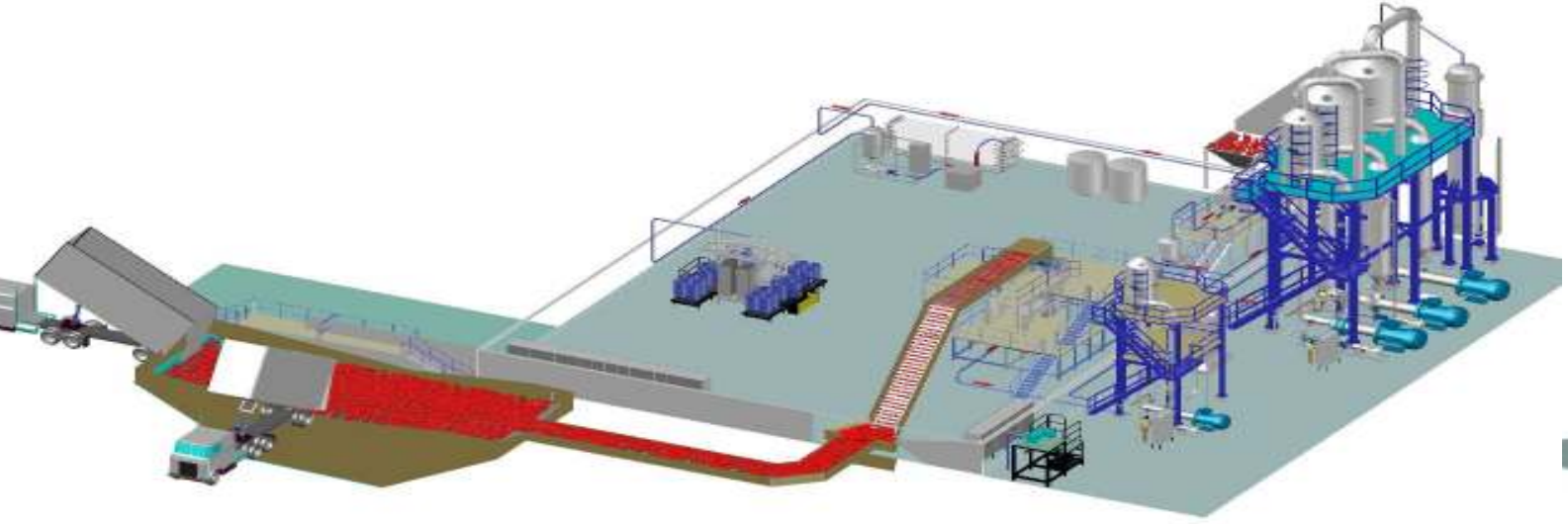
Peeled tomato and diced tomato are niche sectors in the consuming industry. Peeled tomato, diced tomato, crushed tomato, etc, are packed into cans or jars with liquid acid. They can also be mixed with other vegetables. There are plenty of mixes and presentations on the market which vary depending on each individual manufacturer.

Tomatoes can be peeled using caustic soda, mechanical devices or steam. The first one consists in spraying caustic soda over the tomatoes, or in drowning them into caustic solution. Skin will come off. This procedure allows for a better finish, but produces more effluents. For mechanical peeling, blades make an incision on the skin surface. Mechanical hands retain the skin while letting the whole tomato go and separators remove the remaining skin.

In the steam peeling method the pre-heated fruit gets heated very quickly and consequently rapidly cooled under vacuum conditions. Skin separates from pulp. Then skin-removal units will terminate to remove it.

Already peeled tomatoes are then sent to a possible dicing. Peeled tomato, diced tomato, crushed tomato, etc, are packed into cans or jars.





Tomato processing plant

Selecting the right equipment for each process

Tomato reception & washing area

Tomatoes are delivered to the factory by trucks and unloaded by injecting water through mobile hoses into trucks to discharge the tomatoes into storage pools filled with water. This process gives them a first wash, and helps removing all the field dirt and leaves. They can also be unloaded using other methods.

Our tomato reception area with unloading system includes a recirculation pump, staff platform, sludge and dirt discharge, and an air water bubbling system.

Sorting area

On the sorting tables, a human inspection is performed to remove any damaged or spoiled product, as well as any residual materials. A grinder is then used to sort out tomatoes according to size since different tomatoes sizes are used for different purposes.

Our sorting area equipment consists of a tomatoes elevator conveyor, watching units, tomatoes sorting or selection units and discarding hoppers.

A regular tomato plant can house various tomato processing areas, such as peeled tomatoes area, chopped and diced tomatoes area and tomato concentrate or sauce area. After the common washing and grading steps, tomatoes can be dispatched to the different areas.

Peeled tomatoes area

Washed tomatoes to be peeled are conveyed to the peeling section. As we said earlier on, we can perform various type of peeling methods using caustic soda, mechanical devices or steam.

Vapor scalding

For vapor peeling, tomatoes arrive from a feeding elevator and enter the peeler through a feeding valve. The feeding valve monitors the tomatoes input and output through the scalding area, and maintains the inner steam pressure. Our scalders are specially designed to adapt upon tomatoes varieties and maturity, and can apply either pressurized steam scalding previous to water immersion, or simple pressurized steam scalding, or heated water scalding.

After their scalding, tomatoes are sent back to the extraction valve from here they are vacuum cooled and conveyed to the skin removal section.

Chemical scalding

For caustic peeling or chemical peeling, the tomatoes are immersed in a caustic solution or sprayed with it during 30 seconds. They are then exposed to it during a holding time of 30 to 60 seconds before tomatoes are transported to the peel removal section.

Our chemical peelers stand of: a variable speed conveyor to carry the tomatoes, circulation pumps to monitor the temperature of the solution, filters to remove foreign matters from the solution; and a panel control for controlling immersion and spraying times, solution concentration and temperature.

Peels removal section

After their scalding, tomato peels have to be removed. The tomatoes pass through various rubber disks or through a rotating drum section under high pressure water sprinklers to remove the peels. Peels are discarded. After this stage, a human inspection can be performed on inspection tables.

Our peel removal systems are designed to offer optimal peeling for all shapes of tomatoes, avoiding over-peeling and thus yield reduction.

Chopped and diced tomatoes area

Chopping

After the tomatoes have been peeled, it is possible to dice or chop them up. The fruits are conveyed to a chopping unit, where they are processed into pieces of the size wanted by the client, resulting in a mixture composed of liquid and solid parts.

Our chopping system uses a customized crushing mill that allows obtaining customized sizes of tomato dices.

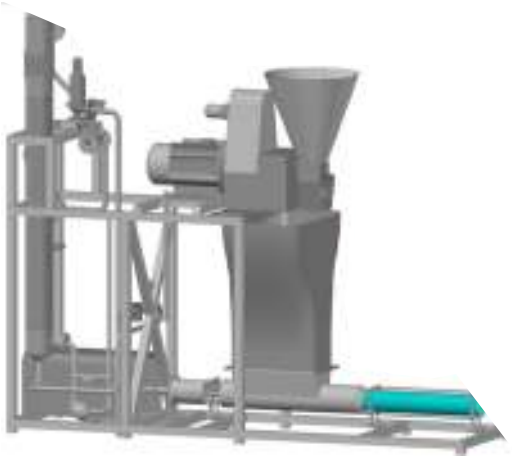
Tomato processing plant

Tomato sauce and tomato concentrate

Tomatoes selected for tomato concentrate and sauce follow the same washing and grading method than the tomatoes to be peeled or diced, but they can skip the peeling part, since they are going to be filtrated and refined. Tomato concentrate and tomato sauce undergo the same processing method, but concentrate will have to get through a more thorough evaporation process.

Crushing

Tomatoes are carried to a crushing unit, where they are processed into small pieces, resulting in a mixture composed of liquid and solid parts.



Our crushing system uses a mill containing a rotor that spins and crushes the tomatoes at high speeds. The resulting paste is pumpable and ready for thermal treatment.

Enzymatic inactivation, hot & cold break treatment unit

The next step, called enzymatic inactivation, is crucial in any tomato processing system, as it prevents the separation of liquids from solids.

Hot break is recommended for high viscosity products such as sauces, ketchup, puree and others. It inactivates completely the pectin enzymatic activity, increasing the consistency and viscosity of the mixture.

Cold break on the other hand is recommended for tomato juice and low viscosity sauces.

Our production plant is specially designed to work on any of the enzymatic inactivation process. This unit is able to swap when required between hot and cold break processing. Our hot & cold break treatment units have been specifically designed to instantaneously increase the temperature of a big quantity of incoming product from ambient to inactivation temperature. Our equipment includes stainless steel atmospheric chamber, stainless steel tubular heat exchanger, pump for product extraction, automatic level and temperature control.

Refining

The obtained mixture needs to be refined by extraction machines to avoid any lumps and get a perfectly smooth product.

In order to improve the product quality and avoid the product oxidation during the process, our system has an optional accessory to work under inert atmosphere, (nitrogen or saturated steam), getting a very high quality product compared to traditional ones.

Evaporation

Different types of evaporators are available.

We use our own tubular heat exchangers branded Gemina, made out of stainless steel and following the latest orbital welding technology, to ensure quality operation and performance.

Our evaporator includes high power recirculating pumps with a recirculating flow, avoiding tomato deposits and product burning in the pipes.

In the final condensation step, the product quality is guaranteed by a vacuum chamber controlled by a high precision refractometer; this device computes the concentration of the product.

Our system can be totally automated and controlled by a refractometer; and supported by a PLC program Siemens branded , and a Human Machine Interface.

Nitrogen generators

Pasteurizer

Forced-circulation evaporators have a processing capacity that could change upon tomato quality and characteristics. Under specific conditions our evaporator could produce a 36 brix product.

Evaporators are designed to be mounted on a self-supporting steel frame, simplifying the packaging, transportation, delivery and in-place assembly.

Sterilization

Flash pasteurization techniques have been developed to minimize the un-desirable effects of heat treatment in the product taste, flavor and appearance.

Aseptic processing and packaging systems minimize the heat treatment damages on the product by quickly heating and cooling the food under aseptic conditions prior to packaging. Due to the high viscosity of the concentrate, these tubes are designed for pressures up to 300 bars, and are pumped by piston positive pumps similar to homogenizers.

Our tomato paste sterilization units are high pressure automated systems designed to work at pressures above 300 bar. Tomato heat treatment goes from 45°C to 110ºC, with a holding section of 60 seconds, and a fast cooling section.

These units, constructed with stainless steel, have been designed to achieve short set-up times and minimal maintenance services. They also have an automatic control system to control product flow, sterilization temperature, residence time and sterility degree.

Forced-circulation evaporators' capacity could change according to tomato quality and characteristics.

Aseptic Filling

We have an extensive experience in aseptic filling in different food industry sectors. Our aseptic filler consists of two cylindrical heads with vertical motion, mounted on a stainless steel structure. The vertical motion control allows highly accurate filling without the use of elevators and also the possibility of using different aseptic bags sizes.

The sterilization of the filling nozzle is achieved by 110 ºC steam in a sealed chamber.

The clean product circuit, completely protected through sterile steam barriers and automatically controlled, includes dosage control by weight, vertical movement with gradual heads to provide weight control and keep the filling chamber clear, continuous operation heads and high filling efficiency.

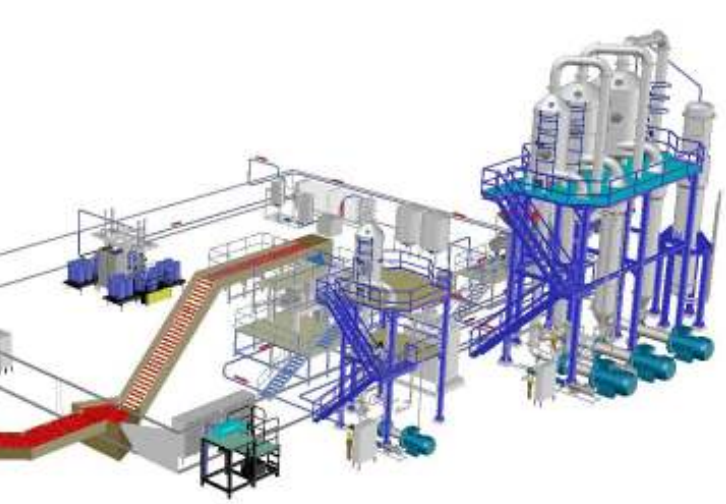
Depending on your final product, we can offer a complete range of packages, from glass jars to tin cans, aseptic bag-in-drums, plastic bottles and many more.

CIP systems

CIP (Clean in Place) units come in a wide range of capacities and automation level according with the system design and process requirements. Our units could include from 3 to 7 tanks depending on if a recovery cleaning solution is necessary or not, or if an additional disinfestation solution is needed.

They will be designed and customized according to the production line, since the CIP capacity must fit perfectly the line configuration, production capacity, product characteristics and requirements.

Our CIP system could include a full automated system, that provides continuous monitoring and control of cleaning parameters, including flow rates, chemical concentration, temperatures, cleaning time, and all the variables required for full process validation.



Tomato plant

Evaporator

Technology

Machine Point Food Technologies is constantly looking for new alternatives and developing proposals to bring to our clients the best manufacturing practices and equipment with high efficiency and performance standards.

Our process equipments built in conjunction with our partner comply with European standards and the highest quality requirements on the industry. We invest in our people and in our managing and construction resource in order to provide our clients with the most affordable and reliable technology to promote knowledge in the area of technical development, research and production. Our clients can be sure that MPFT will respond in a quick and reliable way to their specific needs.

MPFT guarantees that all matters related to your project will be taken into consideration to ensure a tailor-made solution exactly suited to your needs.

As part of the engineering and automation system configuration we supply: project design and layout, equipment selection, drawings and list of material, maintenance and operation manuals.

Installation, configuration and PLC logic programming of the global automated system, touch screens Siemens, electrical panels and cabinets, control wiring, main computer (PC) and control software license.

After-sales services

As MPFT aims at achieving complete customers satisfactions, we are involved during every single steps of your project, from the product design to production start, including after-sales services. Because we want to be your technical partner and support time after time, our services involve project concept, production start and the required technical support to continue with the production, improve the products characteristics and capacities during the following years.

Our after-sales program includes a permanent support service with service and maintenance that takes effect directly after your plant has been set. Customer support also includes defined maintenance and individual inspection agreements to ensure fault-free, reliable operation, and to keep your plant running efficiently for years. A comprehensive range of services are available throughout the entire service life of your plants, all designed to achieve maximum productivity and economic efficiency.

We act as procurement office for spare parts and undertake everything needed for successful operation of dairy plants.

In order to contribute with our client's production continuity, we organize staff training.

Easy to use operation and control system

One of the driving forces of our designers is to make the operation and control of our equipment simple and reliable. For this purpose, we follow in our designs ergonomic and functional standards and our equipment are being continuously updated with the last manufacturing developments.

We use high-quality components and equipment from the market top brands, contributing to reach high reliability, high performance and low maintenance in our systems.

In order to bring additional confidence or guaranty, our units are designed, manufactured and pre-tested in our facilities in Spain before being shipped to our clients. We offer on-the-job training for our clients´ personnel during the installation, set-up and commissioning.

24/7 Technical assistance to our clients

Our 24/7 technical assistance team is focused on helping our clients when it is most important, when it is needed! Our systems include an automated control system with the possibility to be connected to internet at your request, allowing our technical team to have access to the system via internet, directly from our technical service office and helping to solve the situation. This way most problems can be solved immediately, reducing shutdown time and trouble-solving costs.

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