



Fruit Sorting Technology





TAREND is an innovative supplier of turn-key solutions for the sorting, dehydrating and packing of fresh fruits and vegetables. Company was founded in 1981 and expanded its product range by combining years of production experience with the existing perfectionist approach and high quality concept.

TAREND is the market leader in Turkey in sorting technology. Working together with many satisfied customers in Turkey, **TAREND** has also been doing considerable business in the Middle East, North Africa and European countries.

TAREND's strongest characteristic is emphasising on the R&D process with the objective of designing products for the future. Combining TAREND's superior engineering skills with unique designs makes life easy.

TAREND is a customer oriented company and customer satisfaction is top priority for the company. While providing the best solutions; we can still keep our prices at globally very competitive levels. TAREND has kept high quality and cost-effective production, service warranty and the customer satisfaction as its priorities since the establishment.

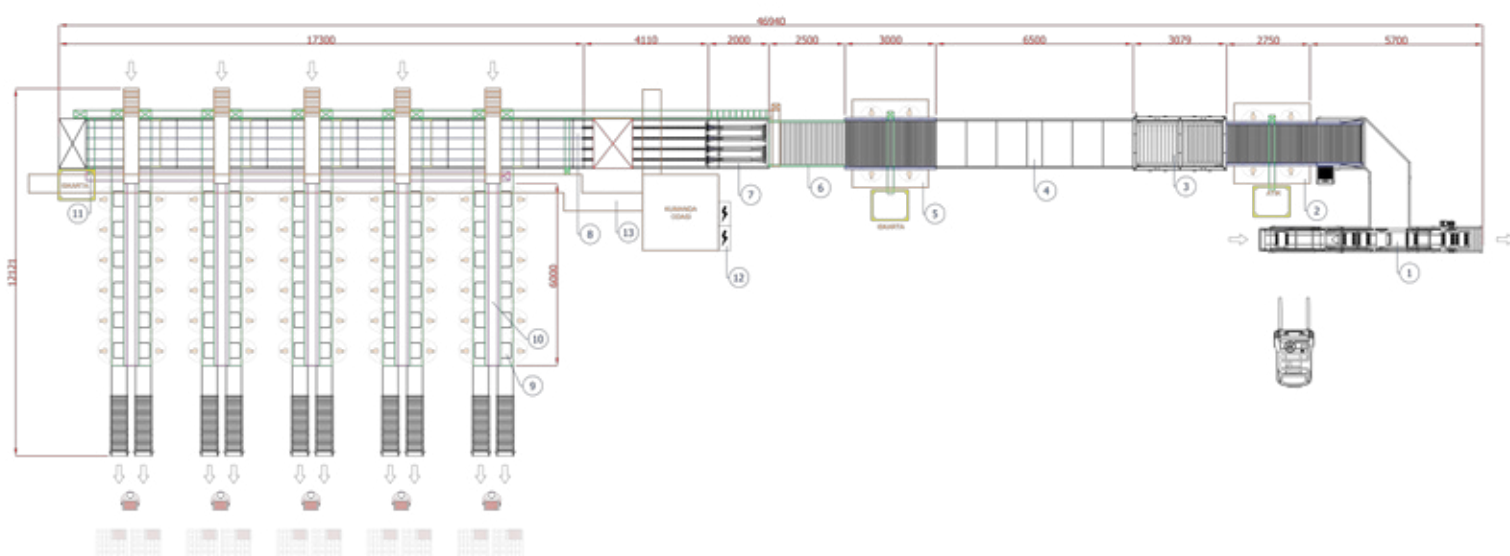


Our Products

Tarend specializes in the development and production of machines for the fruit sortin and packing industry. Main products are electronic sorters, roller sizers, box and bin fillers, packing tables, washing and waxing units, drying tunnels, inspection tables, drenchers and many others.

Besides stand-alone machines, Tarend also supplies complete lines. Customized layouts are prepared for each customer according to their needs and building dimensions. Every project includes detailed layout, technical specifications and price quotation. Manufacturing process is completed according to decided properties and complete line is delivered to the customers facilities as turn-key projects.

- ▶ Electronic sorters
- ▶ Mechanical roller sizers
- ▶ Box fillers
- ▶ Pattern packers
- ▶ Packing tables
- ▶ Washing & waxing units
- ▶ Drying tunnels
- ▶ Inspection tables
- ▶ De-paletizers
- ▶ Palletizers
- ▶ Drenchers
- ▶ Box washing machines
- ▶ Degreening chambers



TAREND produces customized, high quality and cost-effective turn-key solutions.





BEST PRICE / PERFORMANCE RATIO

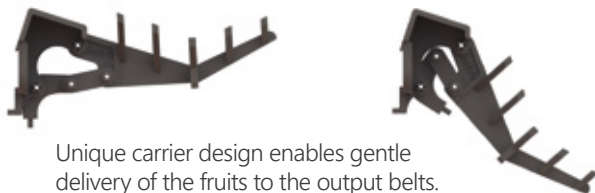
The TAREND Electronic Sorter technology enables precise sorting of all fresh fruits and vegetables within 30mm. to 130mm. diameter range based on the following specifications:

Diameter / Length
Color
Weight
External quality
Internal quality

Electronic sorter is the heart of the fruit sorting and packing lines. High resolution cameras, image processing software, carriers, drop-outs work together in harmony to classify the fruits in an accurate and gentle way.

Drop-out brush and soft cushions are used at output belts for gentle products like apples and pears.

The user friendly interface of the TAREND fruit sorting technology, enables anyone with basic computer knowledge to use the system. Remote connection to the system allows instant performance checks, maintenance and service in an easy way.



Tarend Electronic sorters can offer a wide range of solutions depending on the product and capacity needed.

Number of lines	Capacity (fruits/hour)
2	54.000
4	108.000
6	162.000
8	216.000
10	270.000

* Two or more electronic sorters can be combined together for higher capacity.

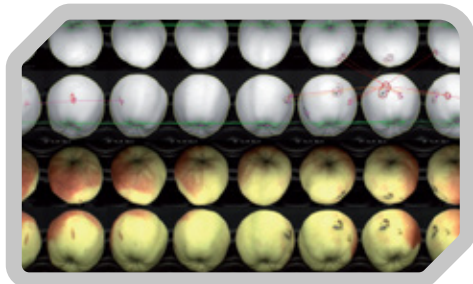
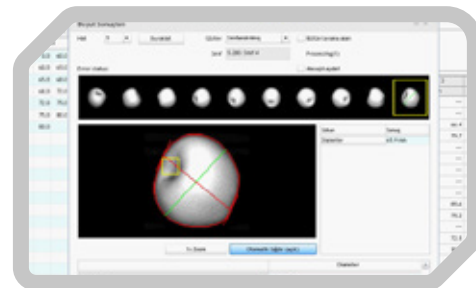
Important Aspects

- Low cost, high quality and performance solutions,
- Diameter & Length, Color, Weight, Internal Quality and External Quality modules,
- Software technology enabling simultaneous measurement up to 24 lines,
- Speed up to 15 fruits/second,
- User friendly interface,
- Instant performance monitoring, service and maintenance with the remote connection feature



DIAMETER / LENGTH

The diameter and length of each product are calculated by using measurements taken from multiple images of the product from different angles. The center of gravity of the product and stem are detected by superior image processing software, for more accurate diameter measurements. Specially designed software algorithms enable fast and efficient measurement of product diameter, length, curvature and surface area.



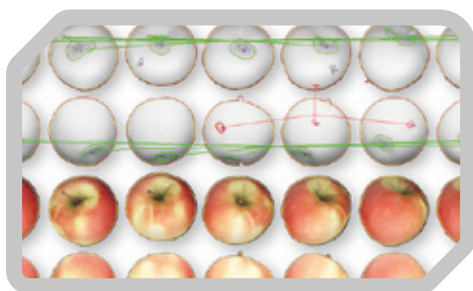
COLOR

The color of the fruit is one of the best indicators of quality and ripeness condition. The TAREND electronic sorting technology enables users to specify the colors on which the fruit will be graded by using live feedback from high-resolution cameras.



WEIGHT

The unique carrier design and superior software technology enable precise weighing with a precision of $\pm 0,5$ grams. Deviations in weight due to temperature differences and dust build-up, are automatically detected and corrected by the software, and measurements are made at almost zero error rate.



EXTERNAL QUALITY

For some properties of the fruit, the color module alone is not enough. Shape and context are also important to determine and distinguish specific properties, such as navel, stem, calyx, mould, scratches, and other defects. For these properties the intelligent external quality module is the solution.



INTERNAL QUALITY

The internal quality of products can be accurately measured by using the full transmittance technology developed by TAREND solution partners, which is used by only a few companies worldwide. Rot, brix, dry matter, acidity and ripeness can be determined accurately.



Box Fillers



Box fillers, fills the boxes loose by weight or by volume.

Inspection tables, empty box feeding conveyors, labeling units can be integrated to automatic box fillers.

The filling chamber enables precise and gentle filling of products into boxes. The chamber gradually moves down as the products arrive and stops the product feeding conveyor when the identified volume or weight is achieved. Then moves down to the bottom of the box and dumps the products into the box and goes up again for the next cycle.



The box filler can be custom-manufactured for different box dimensions.



The box filler can fill up to 4 boxes per minute at maximum speed.

Washing Units

The washing unit is the section where fruits are washed using water and foam and dried by latex sponges.

The complete unit is made of stainless steel. 44 lines of brushes are used for citrus products, whereas 24 or 34 lines of brushes are used for rather sensitive products, such as apples.

Nylon brushes are preferred for foaming, polyethylene brushes are preferred for rinsing and latex sponges are preferred for drying.

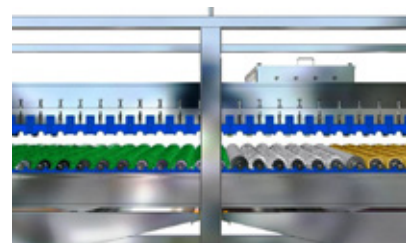


Foam generator: This is the section where detergent and water are mixed by a dosing pump. The foam amount is determined by setting the blade rotation speed via a frequency inverter.

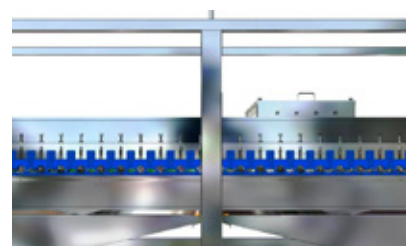
Lift system: The system is developed for quick and practical replacement of brushes and sponges used in washing and waxing units. The upper section of the machine is separated from the bottom section with the motor and screw system, brushes and sponges can be replaced easily without the need for any tool. Brush hair thickness and softness varies depending on fruit variety. This system eases the use of proper brush type required for fruit variety.

Sweeping system: Products move by pushing each other in the washing and waxing units. If no product is delivered from previous unit for a certain period of time or at the end of daily task, the sweeping system is developed in order to prevent the excessive brushing of products. The sweeping system which can be operated by a time-adjusted sensor or a manual button moves the fruit on brushes out of the unit.

Pneumatic sponge squeeze system: Following the rinsing process, latex sponges are used in order to dry water drops on fruit surface. Water collected in latex sponges are transferred to the bottom water tray by automatically operated pneumatic press rollers.



Lift System Open



Lift System Closed



Waxing Units

The waxing unit is the section where fruits are covered in wax. Waxing units are made of stainless steel.

A dosing pump and high speed atomizer motors divide wax drops into small pieces to ensure a more homogenous dissemination of wax on the surface of the fruit.

Horse hair brushes are used in waxing units. 16 lines of brushes are preferred for citrus, whereas 10 or 12 lines of brushes are preferred for more sensitive products such as apples.

Lift and sweeping systems on washing units are also present in waxing units.



Drying tunnels



Drying tunnels are the units where water and wax on the surface of the fruits are dried with the help of heated air.

The new model energy efficient drying tunnels developed based on customer needs through the many years of experience in the business, can run on various energy sources such as solar power, solid fuels, electricity.

The drying tunnel is composed of 2 modules and is 7,5 meters long. Depending on the capacity, it can be manufactured in various widths. Temperature and humidity sensors, radial fan, ventilation flaps and heat exchanger present in each module assist to ensure necessary conditions for optimum drying.

Parameters such as temperature, humidity, air speed, etc. which are important in the drying process are precisely checked to ensure better drying of products.

The automatic roller washing system is composed of a water spraying pipe, pneumatic pressure rollers, brush and dosage pump. They ensure easy cleaning of dirty rollers.

Drying tunnels are coated with 10 cm. thick polyurethane sandwich panels to ensure thermal insulation.

Packing tables

Packing tables are the units assisting manual filling of sized fruits into boxes or trays by employees. Auxiliary units such as overhead cable conveyors for feeding empty boxes, full box conveyors, waste belts, etc. ensures a faster and more organized packing process.

Packing tables differ on the type of fruit to be packed. There are 3 different types of packing tables manufactured; sweeper packing tables, belt packing tables and telescopic packing tables.

Packing tables with sweeper: These packing tables are suitable for citrus. Sized fruits moving on the belt are equally distributed to sponge coated chambers with the help of a sweeper. It is the most common and economical packing table solution for citrus. Depending on the model, it can direct the products from 2 sizes up to 8 sizes to the same packing table. There are models available in different lengths up to 25 meters long.

Telescopic packing tables: This is a patented product of our company where products are equally distributed into chambers with the help of elongating telescopic belts. Since there is no sweeper, there is no contact with the product. Products are transferred directly from one end of the belt to the chambers. It is more sensitive compared to packing with sweepers and particularly preferred for mandarins packing. 2 or 4 different sizes of products can be forwarded to each packing table depending on the model. There are models available in different lengths up to 25 meters long.

Belt Packing Tables: These are the packing tables preferred for more sensitive products such as apple and pears. Products are picked from the belt and packed, they are not collected in any chamber. There are two different models available. In the first model, belts are operated by photocells as the products arrive. When the product reaches the end of belt, the belts are stopped. In the second model, belts continuously run. At the end of each belt, a second belt carries products to the starting point and products pass through employees again.



Box Dumping Systems



Dry box dumper

This is a box dumping system developed for citrus.

Boxes placed manually or by the de-palletizer on conveyor, are tipped to the side by a chain and belt system, and the fruits are transferred to the next unit. Rubber coated chain or a rough top belt is used in order to prevent boxes from sliding.

A dust extraction system can be mounted over the dumper unit in order to prevent dusting. The dumper unit can be easily integrated to a de-palletizer and a box washing machine.



Dumping pool for boxes and bins

The system is developed for fruits requiring gentle dumping into water such as apples and pears.

Boxes and bins are dipped into water by a dumping robot and fruits are carried through a conveyor by the water flow.

Special filters and a cleaning window allow easy cleaning of foreign objects such as leaves and mud accumulated in water.

All parts used in this unit are made of stainless steel.



Roller inspection table

Roller inspection tables are designed for round products. This unit eases the manual selection and observation of products.

Roller inspection tables are manufactured at 900 mm height from the ground as standard. Width and length dimensions vary according to customer requirements.

50 mm. and 56,6 mm. diameter aluminium rollers are used in roller inspection conveyors. The surface of the rollers can be coated with a soft material for sensitive products.

Roller inspection tables may require additional equipments such as single sided platforms, double sided platforms, waste chutes, waste belts, and lighting profiles.





To extend storage period and shelf life and reduce waste, it is advised to drench the fruits and vegetables with water and fungicides.

There are 3 drencher models:

I. Cabinet drenchers

This is the most economic model among other models. There is a cabinet which is divided into 2 sections. Pallets of fruits are washed in sequence. A pneumatic driven door, opens one section and lets the forklift put a pallet into the section and close the other section and starts the washing cycle. A pump circulates the water from the tank to the washing nozzles. **Capacity: 20 pallets/hour**



II. Chain conveyor drenchers

This is a continuous drencher. Pallets of fruits travel on chains. This type of drencher is composed of 3 sections. The feeding section is 2 meters long, the washing section is 4 meters long and the waiting section is 4 meters long. In the washing section, a centrifugal pump sucks the water from the tank and presses it to the pipes and nozzles. Nozzles can wash the pallets of boxes both from the top and from the sides. At the waiting section, water flows back to the tank and it reduces the water consumption. **Capacity: 40 pallets/hour**



III. Dipping drenchers

The dipping drencher is the most advanced type of drenchers. The complete pallet submerges into water and best contact is achieved between fruits and fungicides. The feeding and the waiting sections are identical to chain conveyor drenchers. A hydraulic driven lift system carries the pallets in and out of the water tank. The washing time can be adjusted. **Capacity: 50 pallets/hour**





Please visit our website to find out your Local Distributor.

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