



PLANT AND EQUIPMENT FOR PRIMARY PROCESSING AND COLD STORAGE OF FRESH FRUIT AND VEGETABLES



INNOVATIVE FARM TO TABLE ENGINEERING

www.bajajmachines.com



Adding value to food... through technology



POST HARVEST LOSS AND FOOD SECURITY A GLOBAL CHALLENGE

Post-harvest food losses are one of the biggest challenges faced by humanity and is one of the leading causes of Food Insecurity worldwide. It is estimated that one-third of Food produced for human consumption is lost or wasted-equivalent to 1.3 Billion Tonnes annually.

Most of the Food losses occur at an early stage of the food value chain, mainly due to lack of financial, managerial and technical constraints in harvesting, post-harvest handling techniques and inadequate hermetic / cold storage, sorting, grading and food processing facilities. These have significant nutritional, health and financial impacts affecting small and medium holder farmers.

In most of the cases, simple and cost effective interventions for post harvest handling, storage, grading sorting and processing infrastructure can enable farmers and processors to reduce food losses and substantially increase their realisable value of the crops. This adds to a significant improvement of food security in the respective countries, aligning to the Sustainable Development Goals (SDG), Agenda 2030 established by the United Nations in 2015.

2 ZERO HUNGER



Our company is committed to work for small-medium scale food producers to enable them to double their productivity and income as per Target 2.3 of SDG 2, Agenda 2030 of United Nations.

Turnkey projects for multiple food segments



Primary processing of fresh fruits and vegetables

Washing, grading, sorting, drying and cold storage facilities. Biomass / solar power coldrooms that can be setup in farms and offgrid areas.



Secondary processing of fruits & vegetables

To produce pulp, puree, paste, juice concentrates, jams, juices, ketchup, frozen and dehydrated products and packaged in cans, bottles, pouches and aseptic packaging.



Beverage Processing and Packaging

Packaged Drinking Water, Juice Beverages and Carbonated Beverages etc. with packaging options in Glass/PET bottles, Aseptic Packaging, pouches etc.



Milk/dairy and sweets processing

Pasteurized, UHT Milk, Yoghurt, Flavoured Milk, Cheese, Ice cream, Milk based sweets and end-packaging in cans, bottles and pouches.



Central kitchens for educational / religious / industrial organizations

For processing rice, vegetables & cereals into ready-to-eat meals.



Incubation cum training centers

For university/research institutions for R&D, skill & entrepreneurial development in food processing & packaging technologies.



Bajaj Processpack Limited offers plants and equipment for fruits and vegetable processing and packaging for:

Primary Processing of fresh fruits and vegetables by sorting, washing, drying, waxing and grading using size, colour and weight parameters.

Cold storage facilities using biomass/solar/conventional electricity based refrigeration technologies.

Mission Statement

Bajaj Processpack Limited was incorporated to develop and manufacture reliable and cost effective plant and machinery across farm-to-fork value chain to add value and reduce post harvest food wastage, designed for the small and medium sector requirements in the developing countries worldwide.

Infrastructure

The Plant and Machineries are Proudly MADE IN INDIA. Manufacturing facilities of the company are spread over three state-of-the-art manufacturing facilities across Delhi-NCR, India.

Sahibabad Industrial Area | Noida | Greater Noida Industrial Area, Uttar Pradesh (Delhi NCR)



Over 1500+ satisfied customers worldwide



1500+ PROJECTS
For Food processing set-up worldwide across Asia, Africa and Americas



7

GRADER



Graders are designed to grade the fruits and vegetables based on various parameters like size, diameter, weight, colour, depending upon the market demand and types of fruits and vegetables being handled.

6

HOT AIR DRYING



Suitable for drying of waxed fruits and vegetables to enable the wax to be dried and absorbed on the fruit surface. Can be designed and offered in capacities ranging from 500 Kg -10MT/hr.

5

WAXING POLISHING CONVEYOR



Suitable to apply a layer of food grade wax on round fruits like citrus, apples, avocado, pear, passion fruit, guava, grapefruits etc to improve its appearance, reduce respiration of the fruit and increase shelf life. The equipment incorporates brushes or rollers that rotate and convey the round fruits. The waxing of fruits enables replacement of natural wax on fruits lost during the washing process and reduces respiration and helps reduce weight loss during storage.

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AIR DRYING CONVEYOR



Suitable to remove surface moisture from washed fruits and vegetables.

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SORTING AND INSPECTION CONVEYOR



Suitable to pre-sort and inspect the fruits to eliminate wastage. Can be designed and offered in capacities ranging from 500 kg - 10 MT/hr.

FRUIT SORTING, WASHING, DRYING, WAXING AND GRADING LINES FOR PRIMARY PROCESSING OF FRESH FRUITS AND VEGETABLES

3

WASHER



The washer section are designed for washing of fruit/vegetable. It can be offered on Fruits immersion or roller spray wash designs, depending upon produce being washed.



1

ROLLER INFEED CONVEYOR



Suitable to feed the fruits and vegetables for sorting grading. The unique roller design ensures transfer of fresh produce without damage. Can be designed and made available in capacities ranging from 500 Kg -10MT/hr.



1

SORTING, WASHING, DRYING, WAXING AND GRADING LINES FOR PRIMARY PROCESSING OF FRESH FRUITS AND VEGETABLES

ROLLER INFEED CONVEYOR



Suitable to feed the fruits and vegetables for sorting and grading. The unique roller design ensures transfer of fresh produce without damage. Can be designed and made available in capacities ranging from 500 Kg - 10MT/hr. The Infeed conveyor can be linked to Automatic Bin Dumper in case of higher infeed capacities of over 3MT/Hr.

SORTING AND INSPECTION CONVEYOR



Suitable to pre-sort and inspect the fruits to eliminate wastage. Can be designed and offered in capacities ranging from 500 kg - 10 MT/hr in Belt /roller conveyor design, depending upon Fruits to be sorted and inspected.

WASHER



The washers are designed for washing of fruit/vegetable being handled and can be offered on Fruits immersion or roller spray washer designs, depending upon produce being washed.

The washer can be designed and are offered on 2 design model. The Immersion type washer incorporates Tumble washing and cleaning of soft fruits with an outfeed conveyor with a secondary wash or ozonation system. The washer can be also offered with a roller Conveyor design with a high pressure jet spray system to spray while the round fruits/veggies are being tumble conveyed. Can be designed and made available in capacities ranging from 500 Kg -10MT/hr

AIR DRYING CONVEYOR



Suitable to remove surface moisture from washed fruits and vegetables. Using unique air-knief air removal technology. The Air Drying Conveyor incorporates a roller brush /SS mesh belt conveyor to convey the washed fruits. The in-built Air Knief blowing System ensures high pressure air ,ambient or heated, is blown to remove the surface moisture from the washed fruits and vegetables. Can be designed and made available in capacities ranging from 500 Kg -10MT/hr

WAXING POLISHING CONVEYOR



Suitable to apply a layer of food grade wax on round fruits like citrus, apples, avocado, pear, passion fruit, guava, grapefruits etc to improve its appearance, reduce respiration of the fruit and increase shelf life. The equipment incorporates brushes or rollers that rotate and convey the round fruits. The waxing of fruits enables replacement of natural wax on fruits lost during the washing process and reduces respiration and helps reduce weight loss during storage.

The 1st Section includes a Waxing System incorporating rotary waxing station that ensures smooth and even waxing on the round Fruits. The 2nd Section incorporates a Polishing system which incorporates hair roller brushes to polish the waxed fruits. Can be designed and made available in capacities ranging from 500 Kg - 10MT/hr

HOT AIR DRYING



Suitable for drying of waxed fruits and vegetables to enable the wax to be dried and absorbed on the fruit surface. The hot air drying conveyor incorporates a roller brush/SS mesh belt to convey the waxed fruits for drying. The tunnel is fitted with high velocity centrifugal air system to dry the wax on the surface of fruits and vegetables.

Can be designed and offered in capacities ranging from 500 Kg - 10MT/hr.

OUTFEED CONVEYOR AND PACKING TABLES

Suitable for collection of graded fruits and packing in cartons and crates.

SIZE GRADER

Graders are designed to grade the fruits and vegetables based on various parameters like size, diameter, weight, colour, depending upon the market demand and types of fruits and vegetables being handled.

Mechanical Size Graders: Graders can be designed to grade various round shaped fruits. The Unique grading roller design enables the round fruits to be accurately graded on different round sizes of 3-8 sizes.

Can be designed and offered in capacities ranging from 500 kg/hr to 10 MT/hr.



Mechanical Size Grader



Automatic Sorting-Washing-Drying-Waxing-Electronic Grading for Fruits and Vegetables

Automatic Sorting-Grading-Washing-Drying Lines are designed / assembled in India / Europe (depending upon capacity) and offered under technical collaboration with FUTURA s.r.l., a leading engineering company from Europe.

SINGULATION SECTION
The fruits get aligned automatically on to the load cell based cups for individual grading based on weight / diameter / colour etc.



EMPTY BOXES FEEDING SECTION
Empty boxes are fed manually to the packaging stations.



DISCHARGE AND PACKAGING SECTION
According to the parameters set on the PLC of the grader, fruits are graded as per different sizes and discharged softly from the grader onto the packaging stations.



The electronic graders with high resolution sensors can detect and grade fruits on following parameters:



Weight, diameter and colour



External / Internal defects

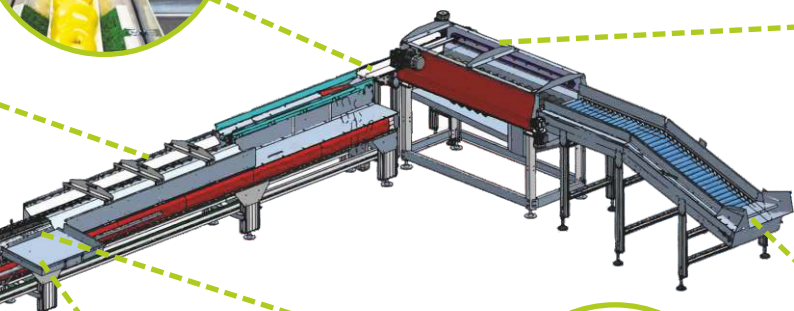


PRE-ALIGNING SECTION

The pre-aligning section incorporates V-shaped transport channels belt with variable speed to align the fruits before they are conveyed to the grading section.



WASHING, BRUSHING AND DRYING SECTION
Fruits get conveyed to the washing, brushing and drying section.



PLC CONTROLS

The PLC controls the entire line and grades the fruits on various parameters: weight, diameter and/or color.



ELECTRONIC GRADER

It can grade multiple fruits based on weight / diameter / colour / external or internal defects.

The graders can be offered on multiple line basis based on the production capacity of the plant.



FEEDING AND PRE-SORTING SECTION
The product is dumped on to the line for pre-sorting and inspection to eliminate the waste.



Automatic Electronic Graders are designed / assembled in India / Europe (depending upon capacity) and offered under technical collaboration with FUTURA s.r.l., a leading engineering company from Europe.



ELECTRONIC GRADER

Graders are designed to grade the fruits and vegetables based on various parameters like size, diameter, weight, colour, depending upon the market demand and types of fruits and vegetables being handled.

The Graders can be offered in the following designs.

Electronic Graders: Electronic Graders can be offered for grading various fruits based on Diameter, colour, weight and for capacities between 5-20 MT/hr in 1-4 lane design models.

The Electronic Grader incorporates load cell based cups that weigh individual fruits and grade them on the basis of weight. This is further augmented and integrated with high resolution optical sensors incorporating high resolution colour and infrared camera that generate 360* analysis of individual fruits.

This is controlled and integrated by a software that can detect the various qualities of fruits on parameter of Colour, diameter, External Quality and Defects, internal quality, density sweetness and Maturity (Optional as per client and market demand and requirements) .

The Advanced Software can incorporate artificial intelligence for grading of fruits on multiple parameters and system algorithms for market driven data programming and analysis.

The electronic Graders would also be interconnected with a Pre-Aligning system which incorporates V Shaped Transport Channel singulator belt to align and sort the fruits into the electronic cups of the graders.

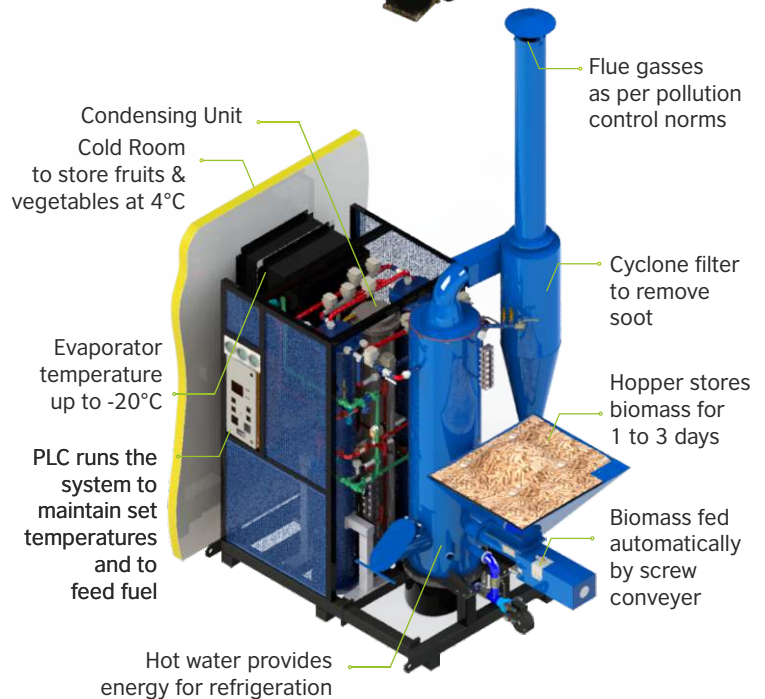


BIOMASS / SOLAR POWERED COLD STORES FOR FRESH FRUITS AND VEGETABLE

Post harvest food loss - A Global challenge

- A majority of post harvest losses of fresh farm produce occur due to lack of farm level cold storage leading to large scale farm losses or distress selling.
- The conventional cold stores can't be installed at the farms in the growing areas due to unavailability of 3 phase power connection load and its last mile connectivity.
- Most of the large capacity cold stores are located in tier 1 - 2 cities and are often dependent on unreliable 3 phase electrical grid connections which necessitates diesel generation sets as backup alternative energy source.
- The high electrical load cost and high operating cost for 24/7 backup of the diesel generators in cold stores make the storage cost high and is unviable.

To overcome the challenge, Bajaj Processpack Limited offers new-generation cold rooms powered by biomass and solar powered (off grid) that can be designed to operate on biomass or solar power, which are not dependent on 3 phase grid power and are easy to operate at very low running cost.



Biomass Powered Cold Room

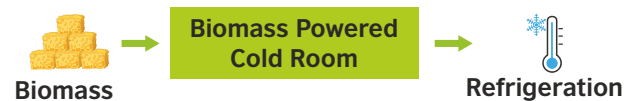
Off-grid and compressor-less refrigeration unit

Zero GHG emission: Zero ODP (Ozon Depletion Potential) & Zero GWP (Global Warming Potential) using R717 refrigerant



Available from 10 - 40 MT capacity

- Temperature Range: +2° to +25° C
- Humidity Range: 65% – 95%
- Cold Storage: Fruits, Vegetables, Flowers and other perishable storage
- Ripening Chamber for fruits



Suitable for Multiple Applications like Fruits, Milk, Flower, vegetables etc with variable temperature range, suitable to be used as Pre cooling, ripening chamber, Cold Storage and Natural dehydrator.

Condensing Unit Specifications

Parameter	GreenCOOL-33	GreenCOOL-42
Cooling Capacity at 0°C Evaporator, 25°C WBT	4 TR (14 kW)	20 TR (70 kW)
Temperatures	Evaporator temperature can be set by user : -20°C to +20°C	
Biomass consumption (3500 kcal/kg)	8 kg/Hr (Average 100 kg/day) ¹	40 kg/Hr (Average 500 kg/day) ¹
Energy source	Compact and efficient hot water generator	
Biomass type	Any loose biomass (straw), pellets or briquettes, steam, waste heat or biogas can be used. Biomass of size 10 to 25 mm can be fed automatically from the hopper. Moisture up to 15%	
Refrigeration technology	Adsorption refrigeration technology patented by New Leaf Refrigerant (R717) with zero Global Warming Potential (GWP)	
Control system	Automatic, computer controlled. DX evaporators with electronic expansion valves	
Electricity Consumption	0.5 kW ² , Single phase	2 kW ³ , Single phase
Installed footprint	10 x 5 ft space	10 x 15 ft space
Installation requirement	Well-ventilated space, protected from rain & direct sun	
Grid power savings	70,000 kW-hr/yea ⁴	250,000 kW-hr/yea ⁴
Carbon emission savings	60 tons/year ⁴	200 tons/year ⁴
Carbon emission savings due to zero GWP refrigerant	2.1 tons/year ⁵	10 tons/year ⁵

¹ Depends on daily loading conditions

² Danfoss condensing unit OP-MCZC171MTA consumes 8.5 kW

³ Danfoss compressor VHZ170 + condensing unit consumes 30kW

⁴ Assuming 24/7 operation and 0.95 kg Carbon/kW-hr

⁵ 1 kg R404A=4470 kg Carbon. Assume 0.125 kg/TR-year released into atmosphere

Condensing Unit Applications

Application	Remarks
Cold Room	Typically, 20 MT (20x12x9 ft) capacity rooms with modular evaporator unit pre-installed
Milk Chiller	Up to 2000 litre BMCs can be integrated to chill milk as per ISO standards
Ice blocks	1 Ton/day. A standard Ice block making machine can be connected to the GreenCOOL condensing unit to chill brine to -10°C to make ice blocks.
Ripening chamber	Ripening of banana, mango etc
Retrofit	GreenCOOL can be installed with existing electrically powered units. GreenCOOL can takeover the main cooling load saving running cost

Biomass fuel sources: Industrial Waste Heat, Rice, Mustard, Cotton, Wheat Husk (10-30 mm), Biomass Pallets or Crushed Briquettes, Brewer's Spent Grain, Winery Waste, Grape Seeds, Grape Orchard Waste, Corn Cob, Coconut Shells, Wooden Logs, Dried Cowdung / Goat Dung cake, Poultry Waste, Sugarcane Bagasse, Cashew, Almond, Groundnut, Tamarind, Spent Coffee Ground



COLD STORES - SOLAR POWERED HYBRID ICE STORAGE TECHNOLOGY

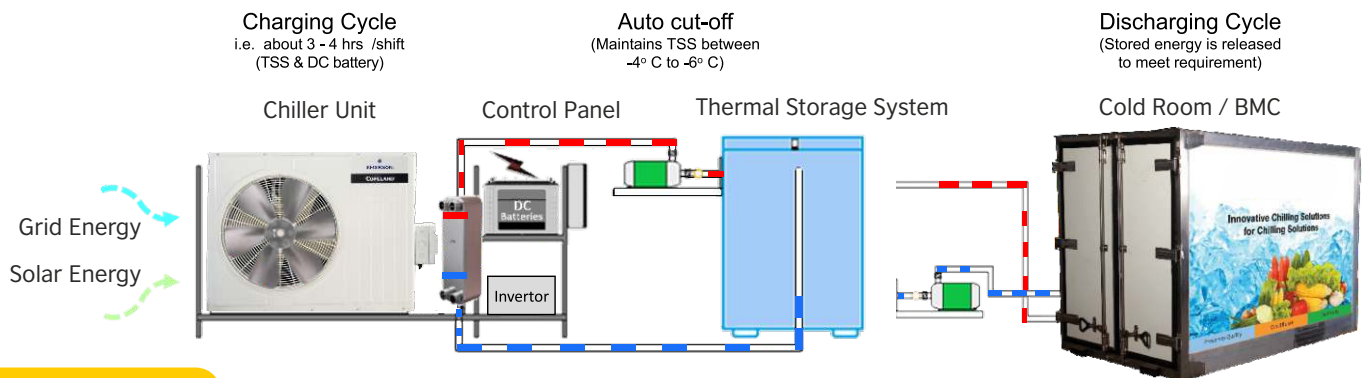
BAJAJ PROCESSPACK LIMITED also offers cold stores with solar powered cold store units with inbuilt thermal energy storage units to provide fast and steady cooling efficiency and short pre cooling duration. The unique cooling technology offered integrates solar photovoltaic cells with solar powered compressors and the thermal energy storage for an efficient cooling application.

This technology bypasses the need of grid or expensive electric batteries and incorporates thermal energy units to store energy in low-cost, reliable and environmentally friendly phase change. These units have no moving parts or chemicals reactions and are housed in Stainless steel construction for a long life.



SALIENT FEATURES

- Offers a steady temperature range between 4-15°C based on thermal energy storage.
- The solar energy is stored in thermal energy storage units for providing cooling during non-solar hours.
- The system can switch to grid electricity as a backup in case of low thermal energy levels.
- Can be designed and offered for capacities ranging between 5-20 MT cold store capacity.
- Can be designed as independent units or integrated container design for quick site deployment.



SPECIFICATIONS

Description	10 MT	20 MT
Internal storage volume	1500 cubic feet	3000 cubic feet
Temperature range	4 to 15°C or 0 to 8°C	4 to 15°C or 0 to 8°C
Cooling backup capacity	200 MJ	300 MJ
Compressor	2 TR	3 TR
Solar photovoltaic panels	6 kWp	10 kWp
Multiple chamber options	1 & 2	



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