



PNEUMATIC CONVEYORS



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Definition, operating principle and general features



How to choose a pneumatic conveyor (PC)



Main use and applications



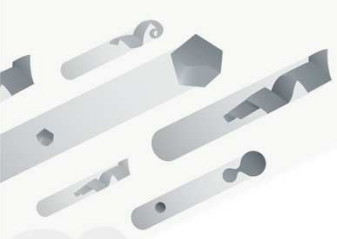
PC range of products



Advantages



Accessories





DEFINITION, OPERATING PRINCIPLE AND GENERAL FEATURES



Suction unit

Transport Line

Discharge unit



DEFINITION

means used to transport solid particles mixed with a gas (air, in this case)



GOAL

to carry solid particles from one point to another inside an industrial plant

Filter unit

Loading unit

Control unit





HOW DOES IT WORK

?

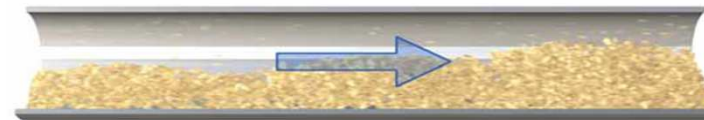


The Suction Unit is connected to the Loading Unit and generates vacuum within itself.
This vacuum inside pipes allows to move the input solid particles



Inside the PC, there is always a Filter Unit conceived to separate air from the carried material, but also an automatic cleaning system which preserves PC's efficiency.
The Control Unit allows to set the functional cycles of the system (loading, unloading, filter cleaning).

Pick-up
point



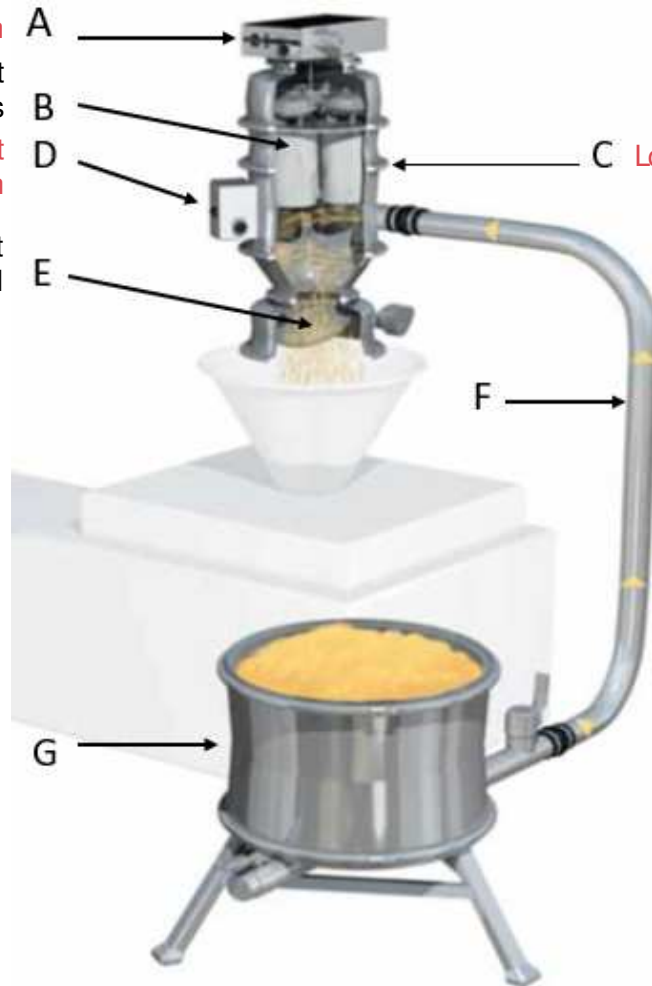
Conveyor





MAIN COMPONENTS OF A TYPICAL PC

Suction Unit generates vacuum
Filter Unit separates air from solid particles
Control Unit sets and checks the system
Discharge Unit necessary to expel the material



C Loading Unit holds the carried material

F Transport Line useful to carry the material towards a precise direction

G Pick-up point necessary to feed the system with the product



1 VENTURI VACUUM PUMP



Advantages

- + Explosion-proof (ATEX)
- + No maintenance required
- + Low noise level
- + No heat emission
- + Easy to install
- + Limited in size
- + High vacuum rate (+15% than competitors)
- + Low energy consumption (-15% than competitors)
- + Suitable for powder and/or granular material



Disadvantages

- + Necessary to have a good compressed air plant with essicator
- + Not suitable to preserve the integrity of the product

2 SIDE CHANNEL BLOWER



Advantages

- + Poor maintenance required
- + Strength
- + Preserves the product from mechanical damages



Disadvantages

- + Energy consumption
- + Big size
- + Second tubular line for air transport
- + Very suitable for granular and/or solid materials



DELFIN PC RANGE OF PRODUCTS

2



PRO LINE

Cheap
Compact
300kg/h carrying capacity for 3 meters transport distance



TECH LINE

To guarantee the highest levels of service quality and reliability.
Capacity product transport of 2.000Kg/h at 20mt of distance



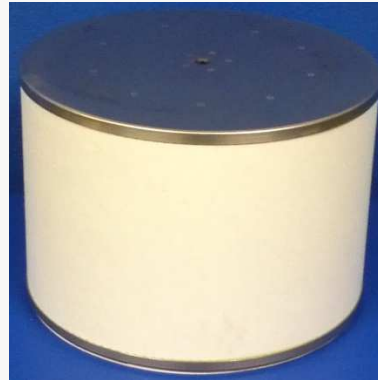
FILTER UNIT |

PRO LINE



**Antistatic Polyester bag
Class M
Granulometry: 3 μ m**

TECH LINE



**Antistatic Polyester
cartridge
Granulometry: 1 μ m**

TECH LINE



**Cartridge Fully made in
AISI 316 Stainless Steel
Granulometry: 10 μ m or
220 μ m
Autoclavable**

- + Easy to remove and maintenance
- + The filter mesh can be of different sizes (as necessary)
- + Field of application: food & pharmaceutical



AUTOMATIC FILTER UNIT CLEANING SYSTEM |

Every time the system carries out a batch loading /discharge operation, an air flow is blown against the mesh (inner part of the filter). The operation is intermittent and is carried out during the discharge phase.

PRO LINE

1

Clean the filter by using a static way compressed air counter-flow

A tube with a series of hole inject air inside the filter at the pressure received from the customer compressor which it is connected

Advantage: no increase in weight or in size cheap system

Disadvantage: low cleaning effect, not suitable for packaging or sticky products

TECH LINE

2

Use dynamic air counter-flow system

A rotating system with nozzles allows to blow air intermittently against the filter surface and against its total diameter

Advantage: no increase in weight or in size, high cleaning effect, suitable for any product

Disadvantage: higher cost





LOADING UNIT

PRO.280



TECH.280



TECH.420



PRO or TECH.280 LINE

- + Product contact parts: AISI 304 Stainless Steel
- + Cylindrical body: Ø280mm
- + Loading capacity 8lt fixed
- + Product entrance: tangential Øint 40mm



Optionals

- + Pneumatic vibrator to help the discharge phase
- + Maximum level sensor for obtain a full loading phase
- + External and internal superficial Teflon-coated or morror polishing

TECH.420 LINE

- + Product contact parts : AISI 304 Stainless Steel
- + Cylindrical body: Ø420mm Modular and expandable
- + Loading capacity 21lt implementable
- + Product entrance: argential Øint 60, 80 or 100mm.



Optionals

- + Pneumatic vibrator to help the discharge phase
- + Cylindrical modul for increase the capacity of 25lt
- + Maximum level sensor for obtain a full loading phase
- + External and internal superficial Teflon-coated or morror polishing
- + Module to increase the load capacity (from 21 to 45lt)

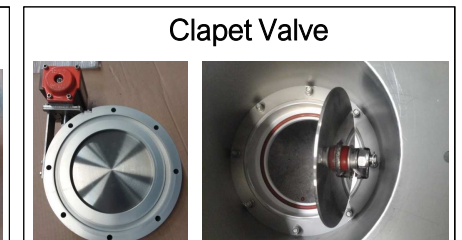
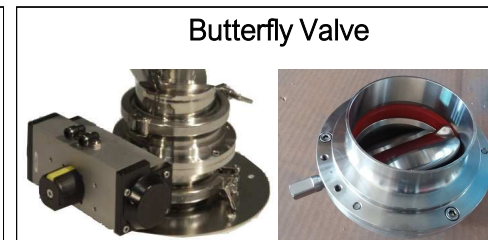




DISCHARGE UNIT

PRO LINE

- + Clapet full discharge Ø100mm
- + Balanced Clapet with counterweight
- + Valve material: AISI 304 Stainless Steel
- + Suitable for sliding products
- + Not suitable when high transport capacities are required or in case of use with very different products (morphology, specific weight, dimensions)



TECH.280 LINE

- + Butterfly Valve, discharge Ø100mm
- + Double effect pneumatic actuator in anodized aluminum
- + Valve material: AISI 304 Stainless Steel
- + Suitable for sliding, non-abrasive products
- + Not suitable for solid products or when there should be no risk of contamination between different products

Optionals

- + Valve actuator in AISI 304 Stainless Steel
- + Clapet full discharge valve Ø150mm

TECH.420 LINE

- + Clapet full discharge valve Ø150 or Ø250mm
- + Double effect pneumatic actuator in anodized aluminum
- + Valve material: AISI 316 Stainless Steel, with body in anodized aluminium
- + Suitable for every kind of products

Optionals

- + Actuator or Clapet body valve made in Stainless Steel
- + Valve closing shutter Teflon-coated
- + Discharge unit realized with a motorized rotary valve for heavy duty





CONTROL UNIT



PRO LINE

- + ABS Casing, to be fixed on the wall
- + Internal timers for the loading and unloading phases
- + Continuous functioning or by an external signal (potential-free contact)
- + Suitable in case of use with a single product
- + Not suitable when the system does not have to control other external devices, in case of use with very different products (morphology, specific weight, dimensions) or when installed in area with risk of explosion (ATEX)





CONTROL UNIT



TECH.280 LINE

- + AISI 304 Stainless Steel case to be fixed on the wall
- + Wheeled pneumatic timers for the loading and unloading phases
- + Continuous functioning or by an external signal (24Vcc)
- + Suitable when the conveyor is equipped with a venturi vacuum pump or when it is installed in environments with risk of explosion (ATEX certificate Zone 22)
- + Not suitable when the system does not have to control other external devices

Optionals

- + Electrical control unit with PLC41-40
- + Control of a pneumatic turbine vibrator (optional)



TECH.420 LINE

- + AISI 304 Stainless Steel case to be fixed on the wall
- + PLC 121-80 with Display for timing the loading, unloading and filter cleaning phases or external devices
- + Continuous functioning or by an external signal (potential-free contact)
- + Suitable when the conveyor is equipped with an electrical vacuum pump (with Inverter or not), when it is used for transport different typology of products or it is necessary to control different external devices
- + Not suitable when installed in area with risk of explosion (ATEX)

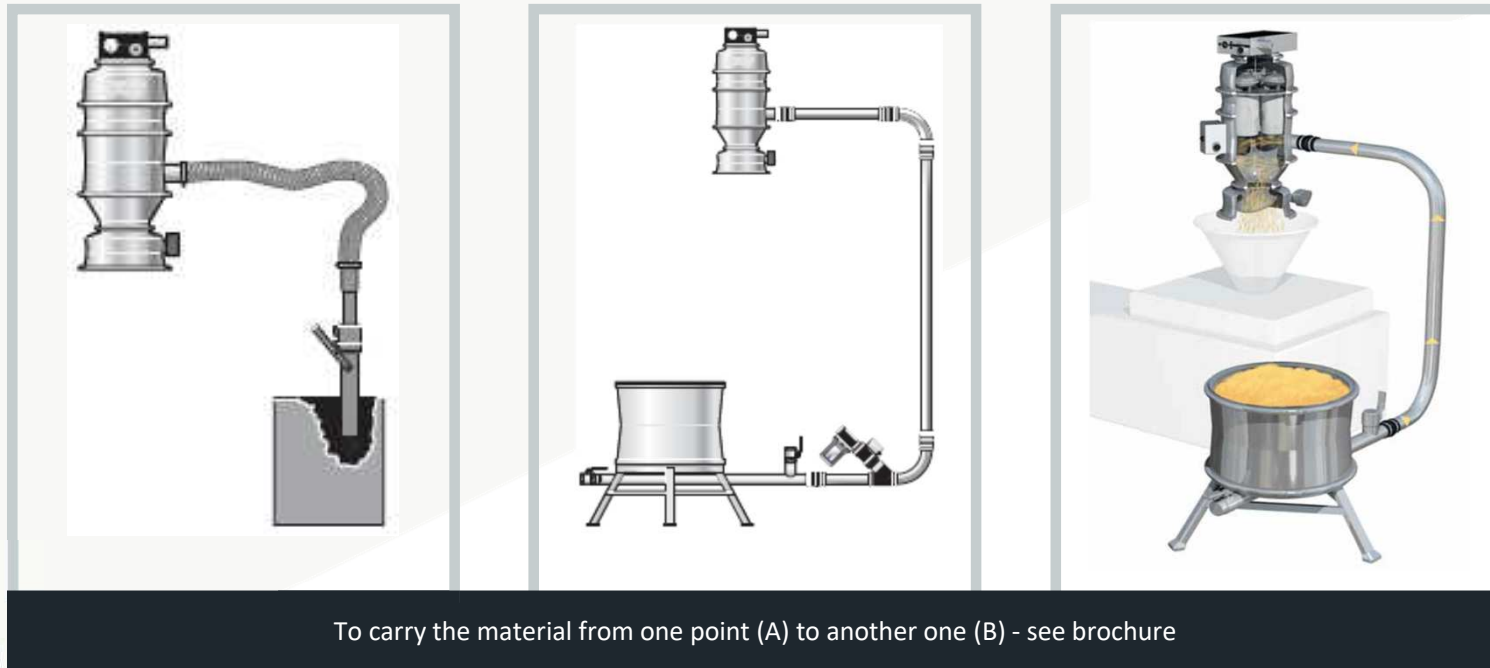
Optionals

- + Control unit ATEX Zone 22 certified





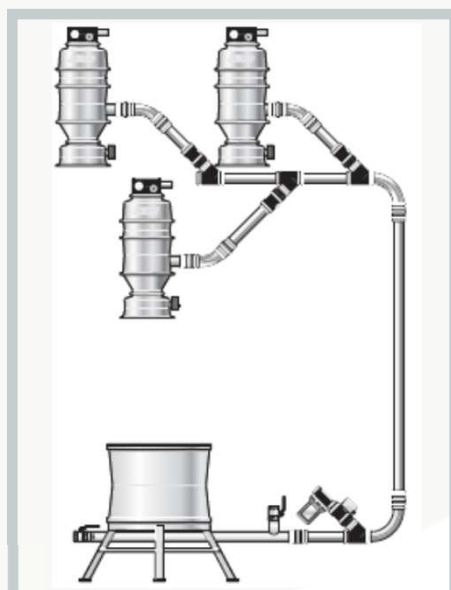
MAIN USE | 3



To carry the material from one point (A) to another one (B) - see brochure



MAIN USE |



To carry the material towards different production units



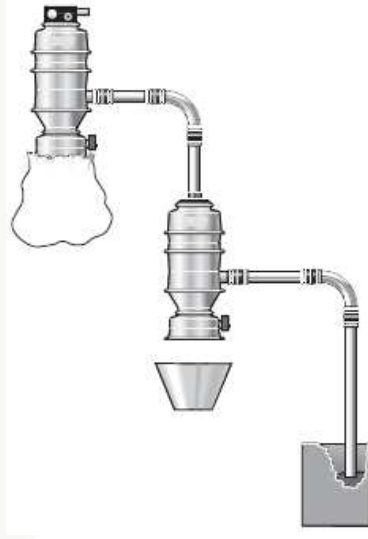
MAIN USE |



To collect different materials and bring them together in a single point of the production chain.



Continuous transport with two alternately working PCs: the first PC loads while the second one discharges the product.



Transport and separation of two different materials with dissimilar characteristics.



Long-distance transports or transport on considerably different heights: to split the product transport line in two different phases, by adding a system in the middle of the line.



POWDERS



GRANULES



SOLIDS

Main fields of application:

- + food/ agri-food, beverage and oil industry, oenological, pet & food, milling industry
- + chemical- pharmaceutical, nutraceutical, cosmetics
- + pvc compounds- rubber - plastics
- + ceramic
- + pallet



FIELDS OF APPLICATION |



Oil industry



Milling industry



Pet & Food



Oenological



Agri-food



Food

- + Packaging machineries, dosing machines, grinders, roasters
- + Oven or baking lines, vibrating screens, granulators, multihead weighing machines, stretching machines, industrial boilers, powder or liquid mixers, industrial kneading machines, industrial cutter machines, dicers
- + Material to carry: coffee (in grains or powder), sugar, salt, milk in powder, powdered cocoa, tea, spices, pet food, dried fruits, legumes, cereals, flours, seeds, cheese (grated, flakes, cubes), starches, colorants, preservatives, rice
- + The product is either picked up from Big-Bags, bulk bags, hoppers, silo, bags or carried from a processing line to the next or to the final packaging machinery (for instance, from a roaster to a grinder; from a dicer to an industrial boiler)



HOW TO CHOOSE A PC SYSTEM

BASIC INFORMATION

Type of material

Name:..... Density-P.S. (Kg/dm3):..... Size (mm):..... Granulometry (µm): Min..... Max.....

Remarks on product features:(ex. Abrasive, clogging, flammable, toxic etc.)

System features

Capacity (Kg/h):..... Transport distance (mt): Horizontal..... Vertical..... N. of bends.....

Product intake point:.....(Bag, Bulk, Big-Bag, hopper, siyos , automatic machine (type):
.....)

Product discharge point:(e.g. packing machine, doesr, mixer, vibrating sift, Big-bag, hopper, etc...)

Environment features: Temperature (°C)..... Humidity (%):.....

Remarks: IF ATEX : zone Power supply:
..... (V / HZ)

Conveyor function:

Continuous (board selector ON)

External (through level sensor or other input. State type of external input, Voltage and Current.....)

Functional notes:

Type of suction unit:

Compressed air (Venturi)

Electrical (side channel blower)



OPTIONALS

START AND STOP SENSOR



CAPACITIVE



CAPACITIVE WITH
PROTECTION HOSING



DIAPASON (vibration)

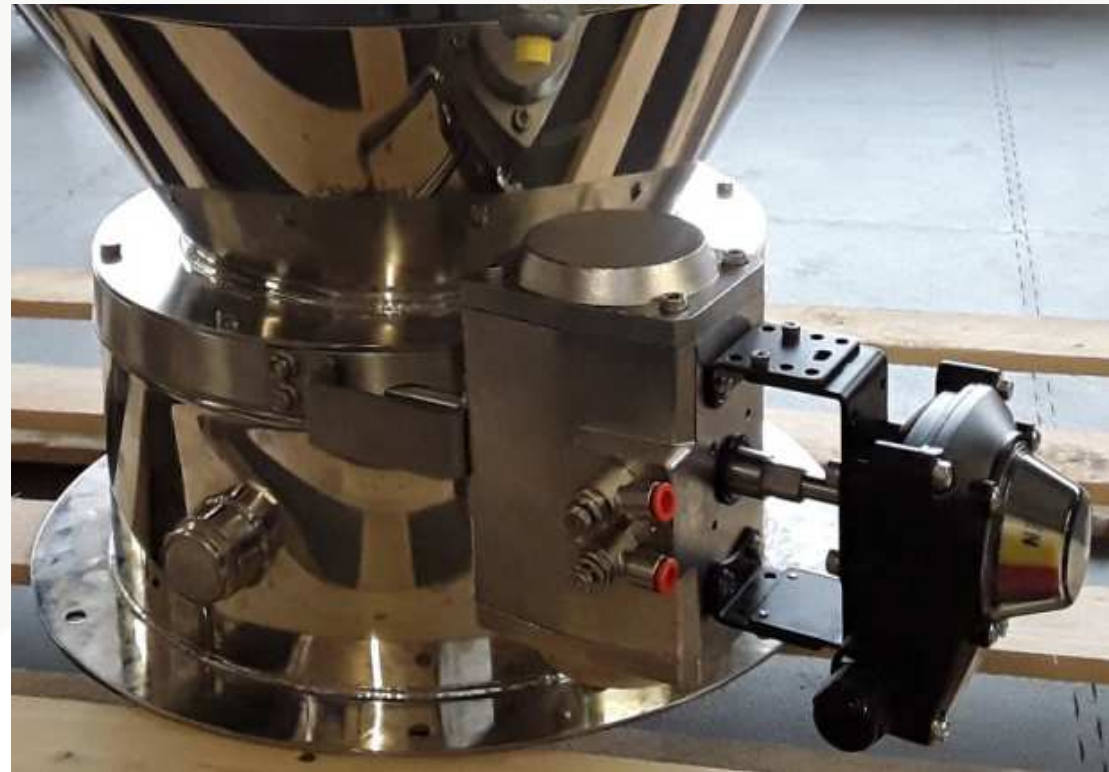
Installed on the receiving system (discharge point) for START and STOP the conveyor cycle





OPTIONALS

Body of the Pneumatic actuator and Clapet Valve in Stainless Steel





OPTIONALS

Rotary Turbine Vibrator

Simplifies the product's discharge phases and prevents cloggings





1 Configuration for automatic cleaning by CIP washing

- + Special filter AISI 316
- + Butterfly valve on the lid for section the Air tubular line
- + Manifold with divo washing balls
- + Maximum sensor level
- + Safety micro on tangential product inlet pipe
- + Pneumatic actuator with the body in Stainless steel AISI 304
- + Clapet valve body in Stainless steel AISI 316



2 Maximum Level Sensor

- Installed on the conveyor loading unit for control the loading phases of the conveyor
- + capacitive or diapason (vibration)
 - + voltage 24VDC
 - + only usable on systems equipped with PLC
 - + it is not possible to add the sensor after completing the purchase



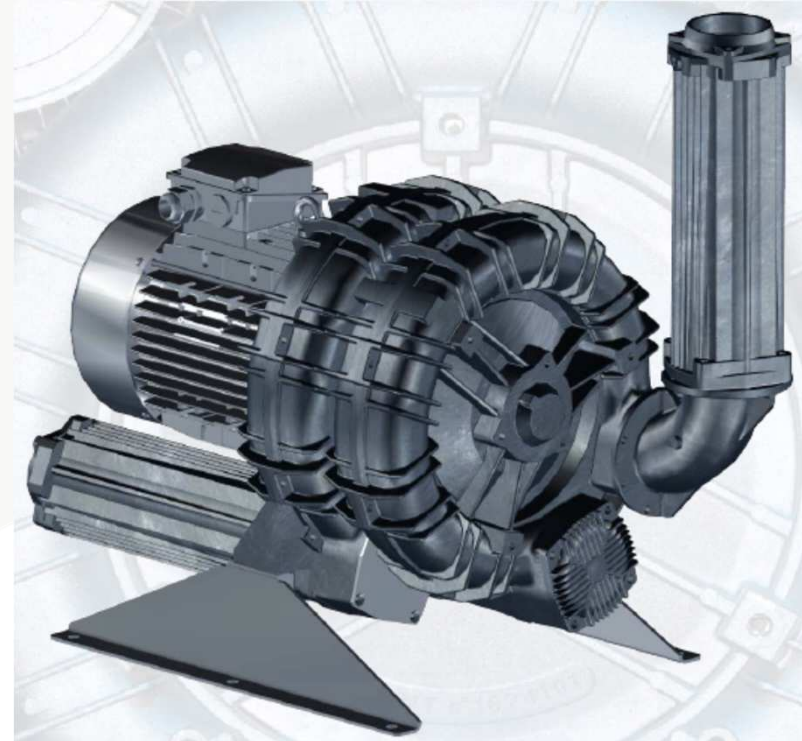
OPTIONALS

ONLY FOR TECH.420.E



Motorized rotary valve

- + Only usable on systems equipped with PLC and maximum/minimum level sensors
- + Suitable when the system does not require accurate sanitization
- + Suitable for transporting material whose integrity must not be kept



Double Stage Side Channel Blower

Suitable for:

- + particularly moist products
- + clogging products
- + products with high specific weight (i.e. cheese, mozzarella, legumes, dried fruit)



ACCESSORIES

REGULATING UNIT AND COMPRESSED AIR CONTROL SYSTEM

To check and adjust compressed air pressure feeding the line



ACCESSORIES ONLY FOR TECH.280.P – TECH.420.P



ACCESSORIES

PRODUCT SUCTION LANCE



Flexible hose

- + Spiral antistatic hose with inner copper twist
- + FDA certified
- + Inner \varnothing 40 / 60 / 80 / 100mm



Suction lance

- + Material: AISI 304 Stainless Steel with filter for good air fluidization



ACCESSORIES

HOPPER

STANDARD DELFIN HOPPER

HOPPER CAPACITY 40 lts



HOPPER MODULE CAPACITY 25 lts



HOPPER CAPACITY 65 lts



- + AISI 304 Stainless Steel
- + 40lt capacity (optional: cylindrical modul for further 25lt capacity)
- + Lower, 90° curve exhaust manifold with Stainless Steel manual valve and filter (for a good air fluidization)



ACCESSORIES

HOPPER



1 Vibrating channel



2 Tape



3 Big-Bag



4 Cutter machines-dicers



5 Mixer

Typical applications



ACCESSORIES

HOPPER OPTIONALS



Automatic discharge valve

- + only usable on systems equipped with PLC
- + Suitable to empty the transport line by constantly removing possible product remainings from pipes



Manual Discharge Valve

- + Suitable to empty the transport line by constantly removing possible product remainings from pipes



ACCESSORIES

Static Positioning system

AISI 304 Stainless Steel frame for pneumatic conveyor support





ACCESSORIES

DYNAMIC POSITIONING SYSTEMS

For safe, simple and fast sanitization and maintenance





THANK YOU

