

Compressed-air and electric pneumatic conveyors

Pneumatic Conveyors: automation is in the air

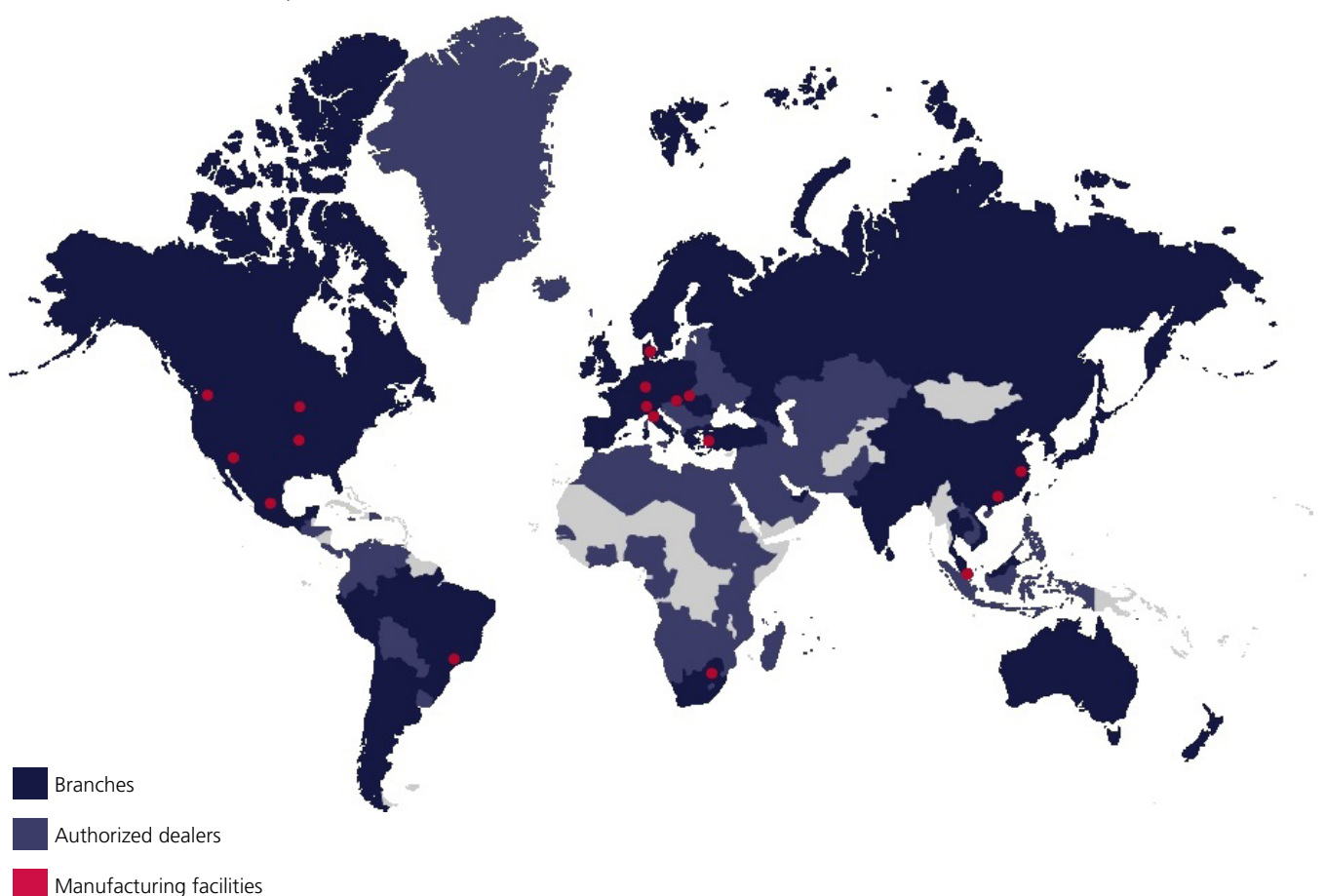


Nilfisk: the world's leading pneumatic conveyor manufacturer

Nilfisk, operating in 70 countries, is a leading manufacturer of industrial cleaning machinery; apart from being a leading manufacturer of "industrial vacuum cleaners", it designs and manufactures also pneumatic conveyors.

Nilfisk pneumatic conveyor department offers technical support, design, production and after-sale services; a comprehensive structure which cooperates with entrepreneurs all over the world who wish to be in full control of their production and to make powder, grain and capsule transport automated and more efficient.

Nilfisk produces compressed-air and electric pneumatic conveyors, ATEX, 1935/2004, FDA and USDA certified. Find out more about our solutions for an efficient and safe transfer of any type of powdery and granular material. A veritable asset for your production process.



What is a pneumatic conveyor?



The pneumatic conveyor transfers powdery or granular materials within processing or manufacturing machinery. The transfer will take place according to the schedule, quantity, distance and height desired.

Operating principle: a suction system creates vacuum within the hopper, allowing the material to be suctioned; then the material is discharged at the point of destination, i.e. a mixer, a packaging machine or a container.

The benefits of pneumatic transfer compared to mechanical transfer are numerous:

- the absence of mobile mechanical parts, except for the exhaust valve, preserves the material's integrity;
- contact with external agents is minimal, ensuring an optimal level of hygiene;
- perfectly integrated into manufacturing processes, enhancing their efficiency;
- higher safety, efficiency and automation.

Thanks to the high level of efficiency of the filtration system, Nilfisk pneumatic conveyors minimize the discharge of dust into the environment. Nilfisk is non-polluting and environmentally-friendly.

Why choose Nilfisk pneumatic conveyors?

There are several reasons why you should choose Nilfisk, one of which is that you are purchasing a comprehensive solution, and not a mere product:

- The entire process, from the very first contact to the delivery of your system is managed by experienced professionals.
- All inspections, feasibility studies, offers and supplies are always carried out by Nilfisk expert technicians.
- We have a wide range of products to meet every need.
- Nilfisk is present in 70 countries.



YOUR ADVANTAGES

Your concrete and measurable advantages are the following:

- Easy and quick to install on the related machines
- No dust discharge into the workplace
- Higher hygiene of the production process
- No compound demixing
- No granule chipping
- No fire triggering sources (ATEX)
- Highly flexible
- Very low maintenance required
- Very limited wear
- Increase in production capacity
- Lower production costs

BENEFITS

Our partners and clients who have chosen a Nilfisk conveyor have listed several benefits, such as:

- Increase of 30% in production capacity
- Reduction of compressed-air consumption by 30%, thanks to the COAX® technology used for vacuum generation
- Reduction of temperature in the departments from 30° to 25°C with the compressed-air solution
- Noise level reduction by 50%

Fields and application areas

Nilfisk pneumatic conveyors are ideal for various applications, such as pharmaceutical, food, plastic field companies, etc...

They are perfectly integrated in the production process; here are some examples of the most common applications:

- Material pick-up from bulk bags, big bags, hoppers, etc...
- Material discharge for:
 - Sieving: the first conveyor feeds the vibrating sieve machine; the second conveyor transfers the material to the next processing step
 - Weighting: the conveyor feeds the processing machine according to the desired schedule and quantity
 - Dosing: the conveyor feeds the dosing unit vessel, according to the desired schedule and quantity.
 - Packaging: the conveyor feeds the packaging machines.

PHARMACEUTICALS



- Pills
- Capsules
- Powders
- Excipients
- Other...

FOOD



- Bakery products
- Sweets, sugared almonds, candies
- Coffee & Tea
- Sugar and derivatives
- Snacks
- Pet food
- Other...

CHEMICALS AND PLASTIC



- Cleaners
- Toners
- Extrusion
- Injection moulds
- Other...

Operational layout - Pick-up

1. Standard pick-up:

The material is collected from small containers at ground level through a probe tube inserted into the pick-up point by the operator; it is then transferred to the relevant area.

2. Loading station pick-up:

The material is collected from a loading station, where the operator pours the material to be transferred; it is then transferred to the relevant area. In this way, the material is suctioned without the operator's action.

3. Pick-up with feed adapter:

The material is collected from a loading station,

automatically fed by a production process upstream. The pneumatic transfer is continuous, it does not require operator intervention, and Nilfisk feed adapter, installed underneath the product pick-up unit, allows to adjust the air intake, in order to obtain an optimal material-air mixture (dense phase vs dilute phase).

4. Hopper pick-up in a controlled atmosphere:

The hopper from which the material is collected has a remarkable capacity, and it allows to transfer high quantities of material; furthermore, it is sealed, thus it can be filled with nitrogen and inert gases, to better preserve air-sensitive materials.



Nozzle pick-up



Pick-up from loading station with level sensor



Pick-up with feed adapter



Hopper pick-up in a controlled atmosphere

Operational layout - Discharge and Filling

- 1. V-shaped mixer filling:** The material is collected from the feeding hopper, directly connected to the V-shaped mixer, which is vacuumed by the suction unit. The process is continuous until the product pick-up unit is emptied.
- 2. Discharge into dosing unit:** The material is collected from the feeding hopper or from the Big Bag directly, and unloaded into the dosing unit hopper.
- 3. Discharge into screw conveyor:** The material is collected from the feeding hopper or from the Big Bag
- 4. Drum mixer filling:** The material is picked up by an operator through a probe, sieved by the vibrating screen and continuously discharged into the drum mixer. The vibrating screen and the mixer are vacuumed by the suction unit.



V-shaped mixer filling



Discharge into dosing unit



Discharge into screw conveyor



Drum mixer filling

Compressed air pneumatic conveyors

Vacuum generation within this type of pneumatic conveyor is carried out by using compressed air systems. Differently from other technologies, this system has a low noise level, high flexibility of use and it takes up less space. Thanks to the vacuum generation technology, the pump feed compressor's energy consumption is similar to that of electric systems such as side channel blowers or vane pumps.

STANDARD LINE

For food, chemical and other industries which require a high level of hygiene.

This conveyor line is ideal when a perfect balance between performance, compactness and low maintenance needs is required. Made of AISI 304 stainless steel, they guarantee a

very high level of hygiene. This range is equipped with the "S series" pump, with a capacity up to 3100 kg/h.

PREMIUM LINE

For food and pharmaceutical industry, which require an excellent level of hygiene.

This line is employed where an optimal level of technology and efficiency is required; it is mostly employed in the pharmaceutical and food industry, where an optimal level of hygiene and excellent production materials are required. All the parts in contact with the material, except for the gaskets and the filter, are made of AISI 316L stainless steel; the "H Series" pump is even more efficient, in terms of energy consumption, and it can transport up to 2600 kg/h.



Premium Pharma Line - PCC00HP



Premium Pharma Line - PCC12HP



Premium Food Line - PCC44HF

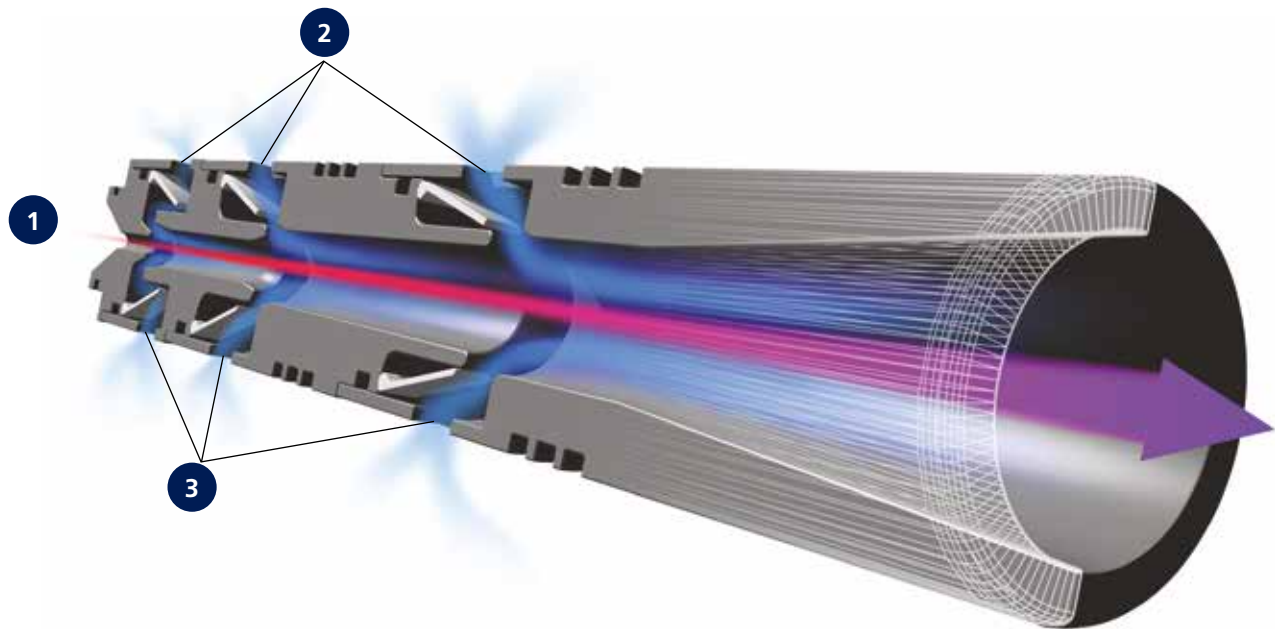


Premium Food Line - PCC44SF

COAX[®] technology

In pneumatic conveyors, vacuum is generated through an ejector system. Ejectors are small devices which generate a suction flow proportional to the incoming compressed air. By modifying the type of ejector, the number of stages and the size of the inlet, exit and suction nozzles, you can reach different efficiency levels.

When the incoming compressed air enters the ejector (1) and flows within it, the nozzles (2) open thanks to the different pressure generated, allowing the air to flow (3), thus generating a certain vacuum. Thanks to the 3 sequential stages and to the special shape of the nozzles, the ejectors have different air suction capacities, based on the pressure of the incoming air.



This special type of ejector is called COAX[®] cartridge. COAX[®] cartridges are the core of compressed-air vacuum pumps of the PCC range. They are small, efficient and reliable, and they can reach different capacities, thanks to their modular system.

The COAX[®] technology suction system can supply 30% more vacuum compared to traditional systems, thus reducing the energy consumption.

Electric pneumatic conveyors

Electric pneumatic conveyors generate vacuum through side channel blowers. Compliant with Regulation 1935/2004, they can also be used in the food and pharmaceutical industry.

STANDARD LINE

For specific applications in food, chemical, pharmaceutical and other industries.

- 3VT Series - conveyor for powder mixtures up to 500 kg/h and/or grains smaller than 1 mm. No demixing of the material.
- 9505 Series - blowing-based conveyor for empty capsules.
- A128X Series with single-phase brush motor - conveyor for materials up to 300 kg/h and grains larger than 1 mm.
- PCT421FG Series - conveyor for tablets or full capsules, to transfer fragile products from capsule fillers or tablet pressers to the packaging machine. This model is also ideal for the food industry, where candies, peppermints or similar products must be transferred while minimizing impact of the products against the hopper walls, guaranteeing an excellent level of hygiene and safety.

"MODULAR SYSTEM" RANGE

Custom-made for specific applications in the food, chemical, pharmaceutical and other industries.

These systems are custom-made based on the client's needs; they can transfer up to 3000 kg/h* of powders or grains. They comprise 2-12 kW suction units with side channel blowers for transport during the fluid or semi-dense phase, and different types of hoppers, based on the type of material and quantity to be transferred:

- AISI304 stainless steel grain hopper
- AISI304 stainless steel powder hopper
- AISI316L mirror-polished stainless steel powder hopper
- AISI304 stainless steel grain/fragile material hopper

Our team of experts, managed by the production facility, will perform the feasibility study in order to identify the best solution for the client's needs.

* based on the bulk density, conveying, length and height.



3VT series



9505 series



A128XR series





















PCT421FG series






How to choose the right pneumatic conveyor






In order to choose the best conveyor for your needs, you need to evaluate several aspects, such as the type of material, its quantity and the level of hygiene required.

Operational and functional differences can be summarized as follows:

APPLICATION	*KG/H	PUMP (SIZE) OR MOTOR (KW)	RECOMMENDED PNEUMATIC CONVEYOR	SUGGESTED MATERIAL	TECHNOLOGY	CERTIFICATIONS
FOOD AND PHARMA	2200-2600	H600	PCC64HF	Powders or grains	Compressed air	  
	1300-2200	H400	PCC44HF	Powders or grains	Compressed air	  
	600-1300	H200	PCC24HP	Powders or grains	Compressed air	  
	300-600	H100	PCC12HP	Powders or grains	Compressed air	  
	100-300	H060	PCC00HP	Powders or grains	Compressed air	  
	100-500	0.6 KW	3VT	Powders	Electrical	
	50-700**	1.5 KW	9505	Empty capsules	Blowing-based electric system	
	100-600	2.2 KW	PCT421FG	Fragile grains	Electrical	

** capsules per second

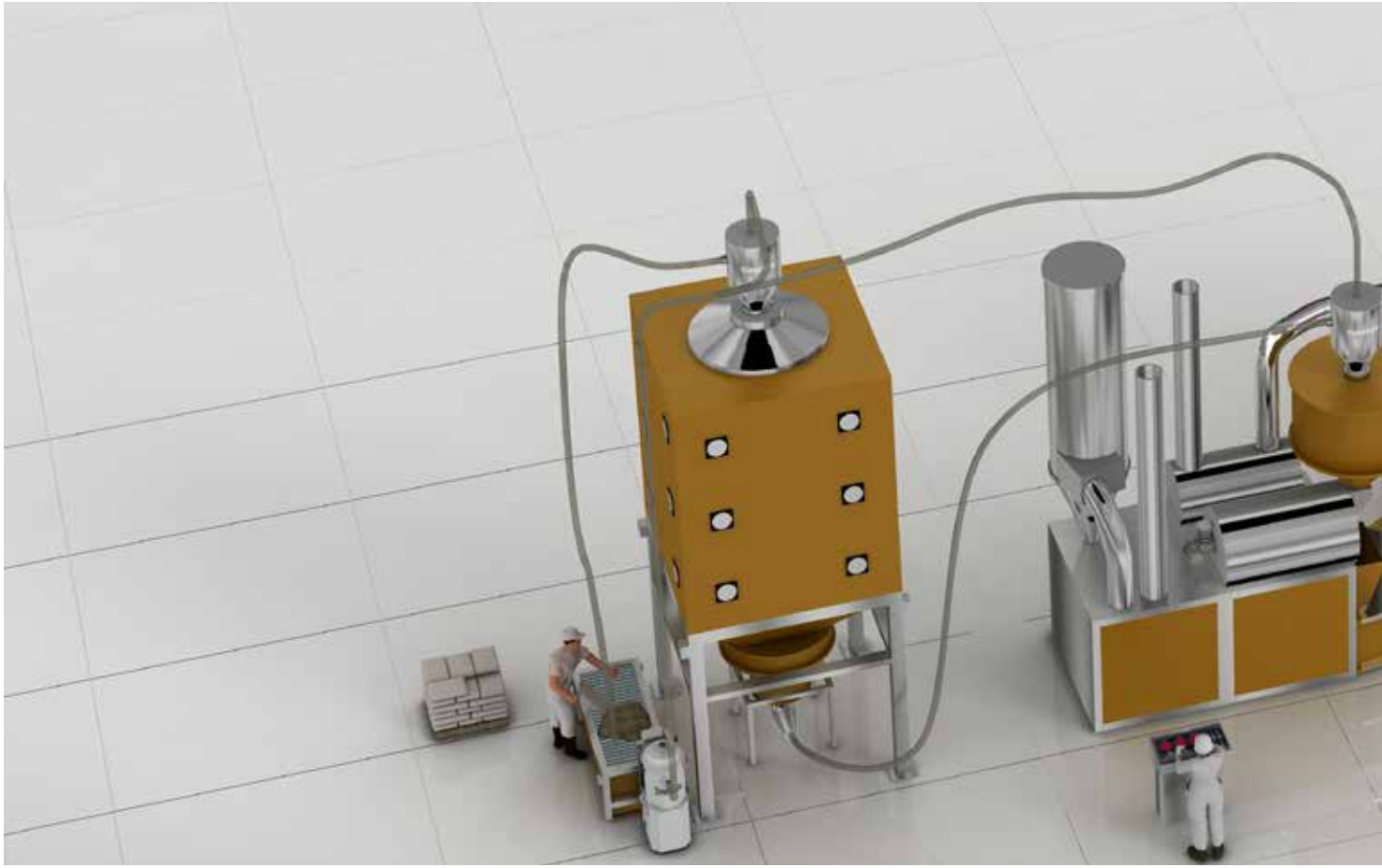
FOOD AND OTHER INDUSTRIES	2700-3100	S600	PCC66SF	Powders or grains	Compressed air	 
	1700-2700	S400	PCC44SF	Powders or grains	Compressed air	 
	100-300	1 KW	A128XRF	Grains	Electrical	
	100-300	1 KW	A128XR	Grains	Electrical	

FOOD AND PHARMA	2100-3000	12.5 KW	Systems	Powders or grains	Electrical	
	1600-2100	7.5 KW		Powders or grains	Electrical	
	900-1600	4 KW		Powders or grains	Electrical	
	500-900	2 KW		Powders or grains	Electrical	
	100-300	1 KW		Powders or grains	Electrical	

OTHER INDUSTRIES	2100-3000	12.5 KW	Systems	Powders or grains	Electrical	
	1600-2100	7.5 KW		Powders or grains	Electrical	
	900-1600	4 KW		Powders or grains	Electrical	
	500-900	2 KW		Powders or grains	Electrical	
	100-300	1 KW		Powders or grains	Electrical	

* performance may vary depending on the material bulk's density and on conveying length.

Main application areas



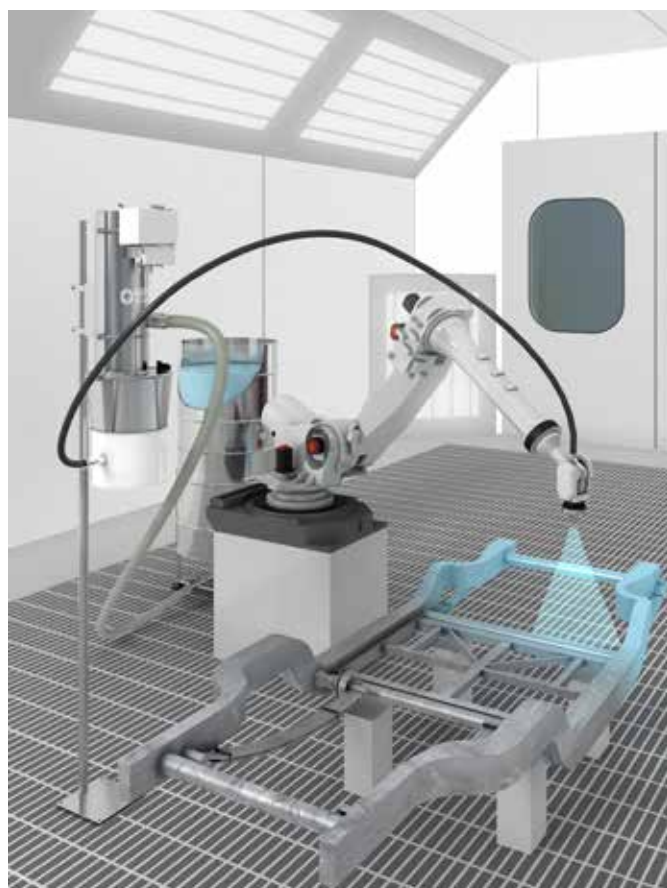
Comprehensive coffee processing range: filling of silo with green coffee, transfer to the roasting unit, pick-up from destoner and filling of silo with roasted coffee; pick-up from coffee grinder and transfer to ground coffee silo. The process is completed with the transfer of ground coffee to the packaging machine.



Tablet transfer to blistering machine.



Filling of dosing unit on double vertical packaging machine.



Industrial painting robot feeding

Pneumatic transfer system development process

Nilfisk “Pneumatic conveyor” division can count on expert personnel offering comprehensive client support throughout the different steps:

- Collecting data and preliminary information (surveys, offers and consultation)
- Researching and designing an optimal solution
- Technical support throughout the world

The pneumatic transfer system development process is divided into different steps:

1. After the first contact with Nilfisk, the client and Nilfisk specialist fill in a guided form together; if necessary, a survey of the location will be carried out in order to define the specifications for designing the best solution.
2. After gathering all the necessary information, Nilfisk specialists, together with the dedicated team, design the most suitable product for the client's needs.
3. The offer, containing all the necessary parts of the system, is then submitted. If the client accepts the offer, the system components are produced.
4. After the system is delivered, it is installed directly by the client.
5. In some cases, Nilfisk takes care of commissioning the plant at the client's facility.

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OUTDOOR

MACHINERY

METAL



FOOD



PHARMA



Nilfisk

clearing the way for a safer,
cleaner and more productive everyday

