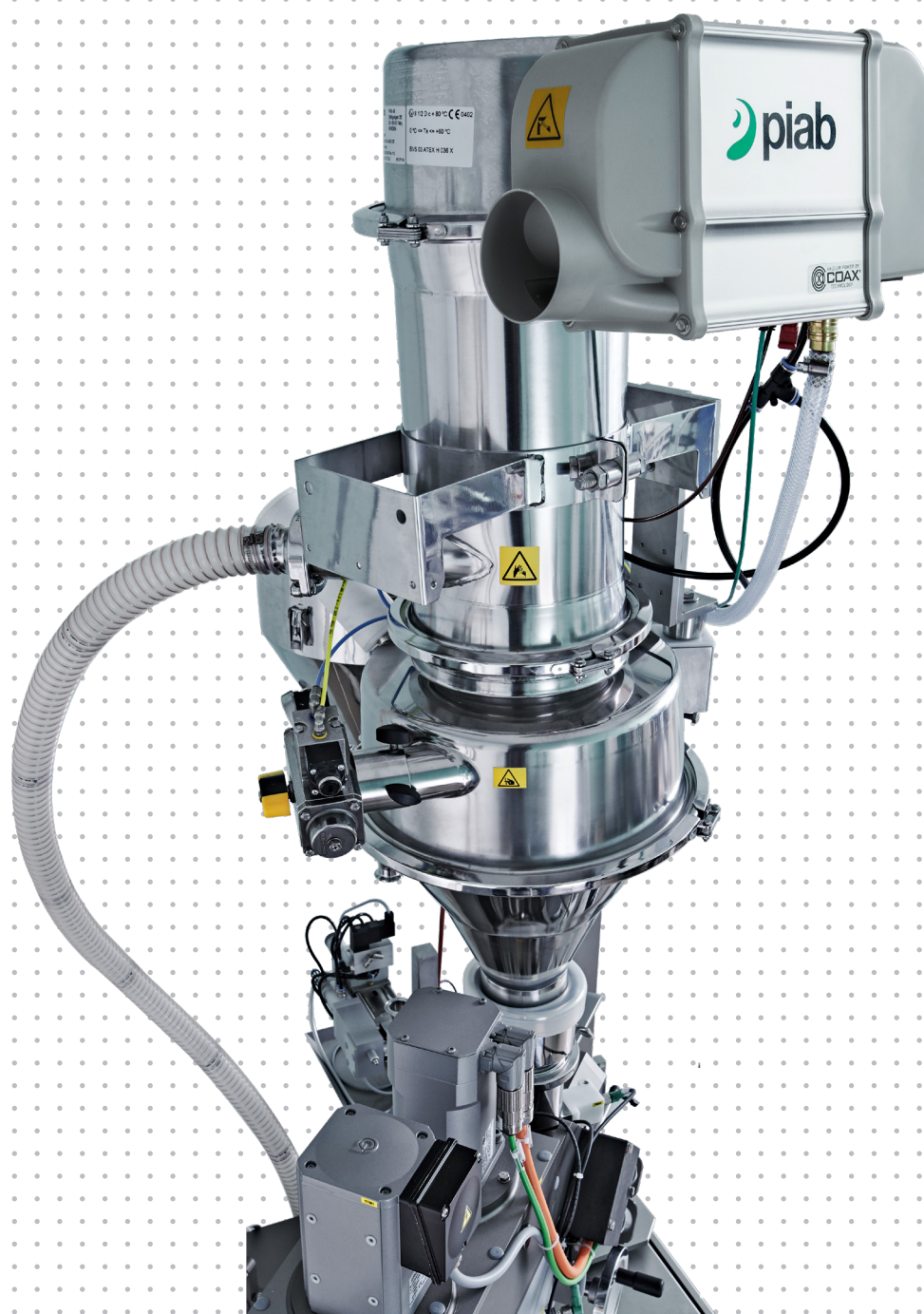


piFLOW®

Customized solutions by modular design



Smart solutions for the automated world™





Integrate 60 years of global vacuum experience into your solution

With more than 60 years of experience, we are the leader within vacuum conveying technology – that is our core business. We have built up global expertise in vacuum conveying that you can easily access.

We have integrated our products in various industries e.g. Consumer and food, Pharmaceutical and Chemical. You have the possibility to integrate the vacuum conveyor as a part of your solution. This gives you the possibility to focus your resources on your core business.

With our worldwide sales offices, we will be your local conveying expert for you to grow your business and are there for you to support you in your process.

Short delivery time

Our vacuum conveyors are all designed through a modular program based on standard components. This gives you the possibility to convey a wide range of different customer products, still with a limited number of standard modules. Hence you can depend on the piFLOW® being available with a short delivery time.

Instant access to all documentation

To simplify the process we give you access to our unique web interface where you are able to configure your product and download relevant documentation e.g. CAD files, datasheets, manuals etc. This gives you the benefit of being in control of your projects in an easy way.



Vacuum conveying and its great benefits

Vacuum conveying is a modern way of transporting powders and granules with a number of benefits.

Reduce product scrap and product contamination

When using a vacuum conveyor your customers are working with an enclosed system where they will not have any foreign material mixed in or have any product falling off the sides into the surrounding area. It is also a very gentle way of transporting the product, meaning that the product will be intact/not damaged throughout the whole transportation process. The velocity is adjusted depending on the product's fragility – giving your customer minimum product scrap.

Small Footprint

The vacuum conveying solution has a small plant floor footprint since the tubing can go strictly vertical from the point of suction. The tubing is normally mounted in level with the discharge point and therefore not in conflict with other machinery. This means that your customer can utilize the space in a more cost-efficient way. Furthermore, if the production layout is to change, new production equipment etc, a vacuum conveyor fits the new layout without modification or new costly investment.



Minimize maintenance

Piab's vacuum conveyors have very few moving parts, meaning that the service and maintenance cost is kept at a very low level without needing to compromise on the reliability of the system. You can disassemble the conveyor body without using tools. The pump unit is designed with a separate vacuum module that can easily be removed for cleaning, resulting in reduced downtime.

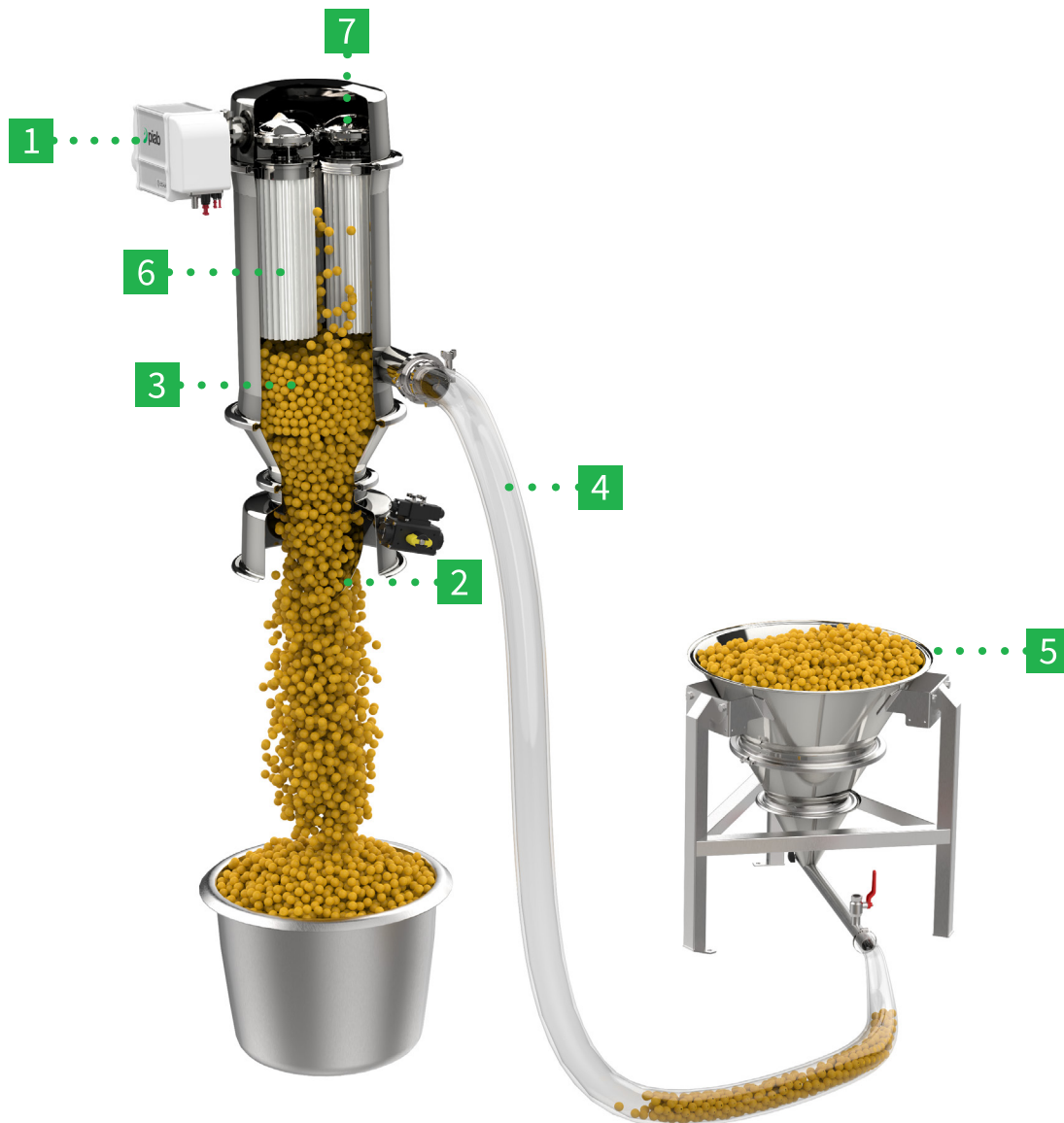
Dust free working environment

When comparing with mechanical conveying systems such as screw and belt conveyors – another important advantage of the vacuum conveying is a dust-free working environment. As vacuum conveying is an enclosed system you will be able to improve the working environment, and it will also give you the possibility to convey materials that are hazardous to inhale that needs to be contained.

Production flexibility

By replacing just a few parts of the modular vacuum conveying solution, one can easily change the installation in order to increase conveying distance, change the plant layout or enhance the system capacity at a very reasonable cost. This gives a future proof installation without compromising the reliability of the system.

The principle of vacuum conveying



Vacuum is created with compressed air through COAX® technology or mechanical pumps (not shown in picture) (1). The bottom valve (2) closes and the vacuum increases in the container (3) and the conveying line (4). The product is carried away from the feed station (5) into the conveying line and then to the container. The filter (6) protects the pump and the surrounding area from dust and small particles. During the conveying time, the air shock tank (7) is filled with compressed air. At a preset or automatic time, the pump and

the conveying are stopped and the bottom valve (2) is opened. The product is discharged at the same time as the air shock is activated and the compressed air cleans the filter from dust and small particles. When the pump starts again, this process is repeated and a new cycle starts. The suction time and emptying times are normally controlled by a pneumatic, an electric control system or completely automated with the new smart systems.

Conveyor for every need

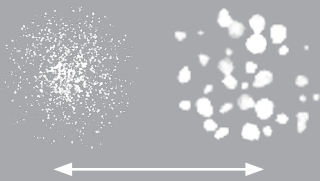
The modular design makes it possible to convey efficiently with a small footprint. Production capacity from few kg/h [lbs/hr] to 15 tons/h [30,000 lbs/hr] and up to +60 meters [+200 feet] in conveying distance together with high vertical lifts, up to 20meter [65.5 feet].

Pumpunit - modular and flexible design. Easy to adapt to have an efficient conveying system.

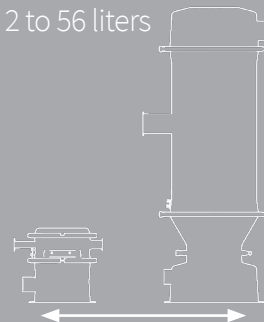
Density - Can convey from 0.1 gram to 9 kg [20 lbs] per liter



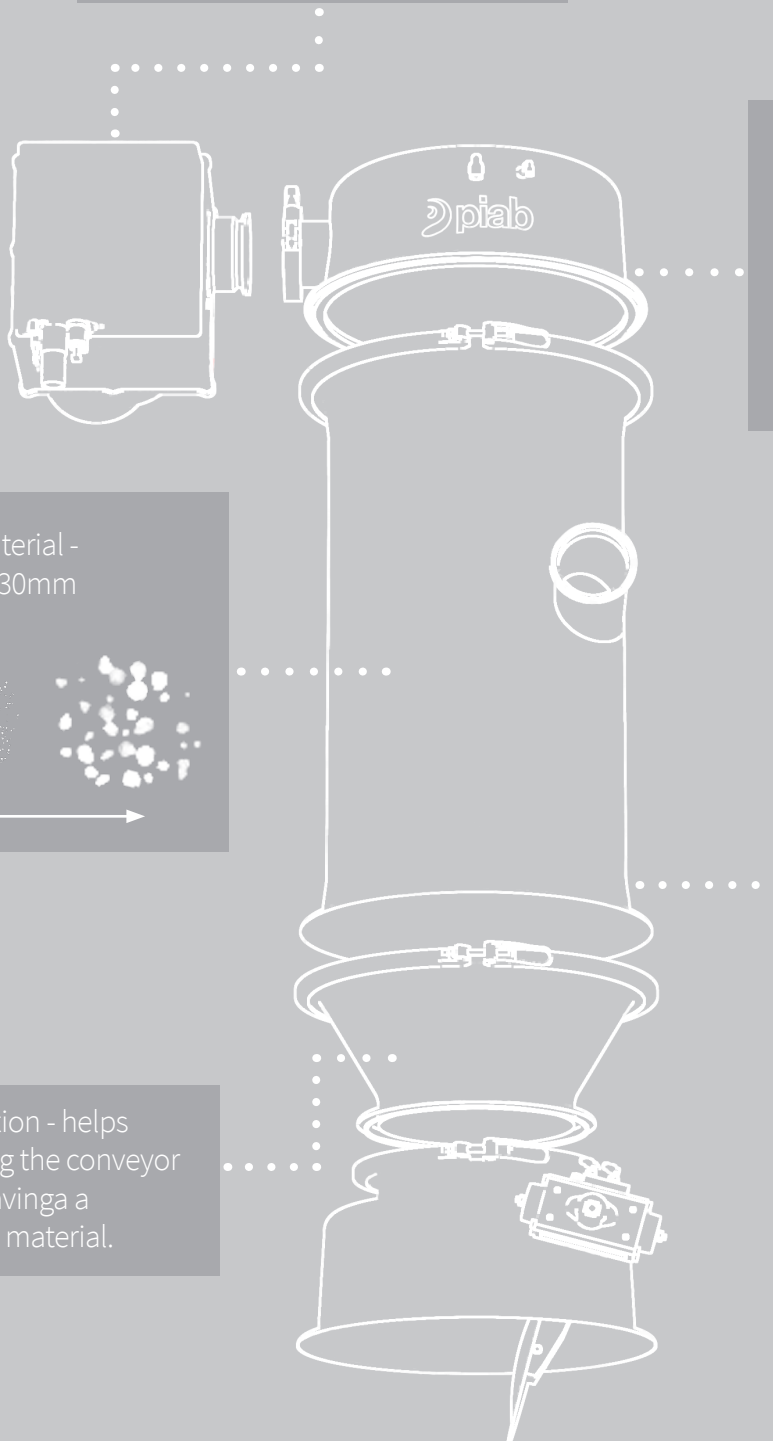
Size of material - 0.5 µm to 30mm



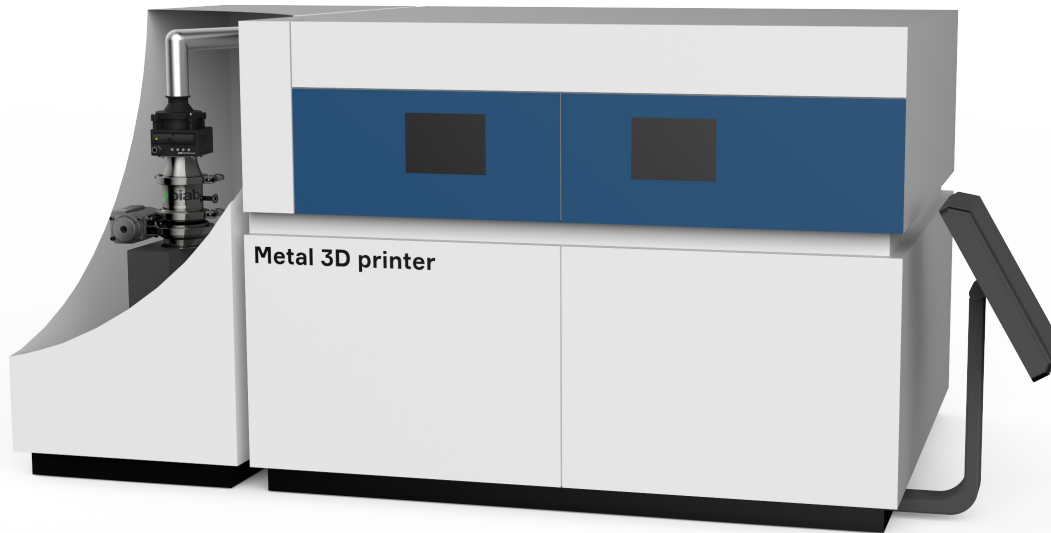
Modular - Can have a batch volume of 2 to 56 liters



Fluidisation - helps emptying the conveyor when having a bridging material.



Safe and clean powder handling for additive manufacturing



Piab's vacuum conveying technology can be used to solve many different challenges related to additive manufacturing (AM). It is a perfect technology for filling a printer with metal powders, reclaiming/cleaning excess material from the printers post-production, and filling or emptying metal powders from/to adjacent equipment such as a sieve or a powder container.

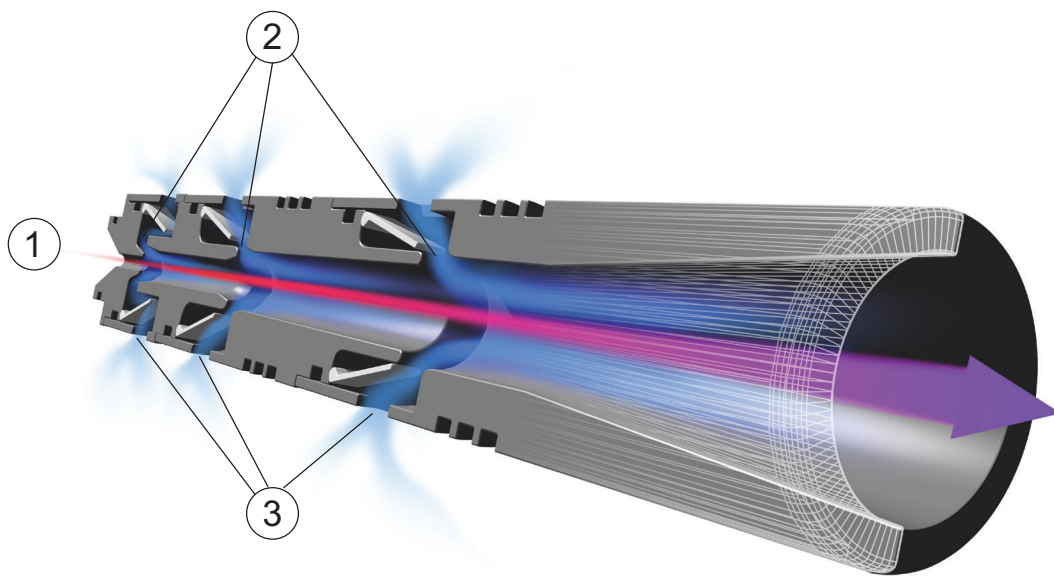
Furthermore, Piab has vacuum conveyor conveying solutions for non-inert and inert atmospheres, and tests prove we can convey powder with a bulk density of 8kg/liter [500 lbs/ft³] giving a throughput of 200kg/hour [450 lbs/hr]. Also, we are flexible in terms of additive manufacturing technology applied and we can convey AM powder for Powder Bed Fusion, Binder Jetting etc.

The use of Piab's vacuum conveying technology will enable the AM process to protect people from contact with hazardous materials, the metal powder from contamination or unwanted chemical reactions, and the environment from pollution.

As a supplier to the pharmaceutical, chemical and food industries, Piab faces similar issues daily and draws on 40 years of experience.

The piFLOW[®] vacuum conveyors were developed as a closed system to solve these challenges. Filters in the vacuum conveyor as well as additional exhaust air filters on the vacuum pump prevent fine dust from entering the workspace and thus avoiding employees to be exposed to hazardous substances. piFLOW[®] vacuum conveyors are also ATEX certified and come with a 5-year warranty.

Increase your customers energy efficiency through COAX[®] technology



COAX[®] cartridges are based on advanced technology for creating vacuum with compressed air.

The COAX[®] cartridges are smaller, more efficient and more reliable than conventional ejectors, which allows for the design of a flexible, modular and efficient vacuum system. A vacuum system based on COAX[®] technology can provide your

customer with three times more vacuum flow than conventional systems, while reducing energy consumption.

When compressed air (1) passes through the nozzles (2), air is pulled through with the stream of compressed air. Suction will be generated at the opening of each stage (3), resulting in vacuum.

System solutions

piFLOW[®]p SMART

Our smartest product offering, taking vacuum conveying to a new level, fully automated with optimised throughput.

piFLOW[®]f

For applications with less demands on acid resistance, but still fulfilling all the needs a piflow[®]f could be a good choice.

Feeding Accessories

In pipelines with a vertical lift of between 8 and 25 metres [25-80 feet], the Pipeline Emptying Unit makes sure conveying lines are properly emptied, preventing blockages. Clearing vertical pipeline sections at the end of each suction cycle, this procedure is adjusted by the electrical control unit.

Control units

There are a range of control units from pneumatic to advanced software controlled control units.

piFLOW®p

For pharma and other applications with high demands on product contact areas, together with acid resistant stainless steel quality, and ATEX or none atex demands, we recommend a product from our piFLOWp range. Specifically designed for quick and easy dismantling for easy cleaning of equipment.

piFLOW®t

For applications with the need of conveying fragile products, we recommend our piFLOWt model. PiFLOWt is designed to fulfil the needs through controlled low speed conveying of the product and guided entry of the product, together with elimination of all the sharp edges in the entire product flow. You easy adjust the product flow through the innovative piGENTLE functionality.



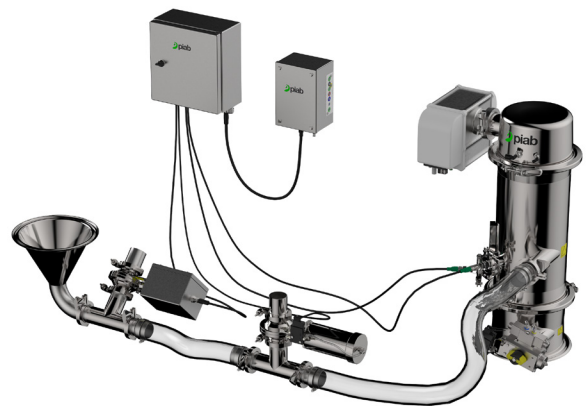
Products

Piab's product series is called piFLOW® and it is offered in five models for the food industry, the piFLOW®f for the basic food industry, piFLOW®p for premium applications and piFLOW®t for conveying tablets, capsules or other fragile material that needs gentle conveying. Here is an introduction to the products suitable for this industry and their main features. Our COAX® Technology, the most energy efficient way to produce vacuum, is used in the pump. piFLOW®fc for food/chemical applications without acid resist demands.

All vacuum conveyors have a 5 year warranty.

piFLOW®p SMART

- Complete vacuum conveying system with self-optimized throughput thanks to machine learning.
- In compliance with FDA, EC No. 1935/2004 and EC No. 10/2011.
- Steel quality ASTM 316L (stainless steel, acid resistant).
- Designed according to USDA guidelines.
- Intuitive to operate and maintain.
- Quick installation and start-up as a result of pre-configured conveying settings.
- Operator-skill independent. Safe and smooth conveying thanks to overfilling protection, automatic sensor cleaning and anti-blockage function.



piFLOW®t

- Perfect fit for transport of fragile materials, where the unique piGENTLE® functionality secures a smooth and stable product flow.
- In compliance with FDA, EC No. 1935/2004 and EC No. 10/2011.
- ATEX Dust and Gas certified.
- Steel quality ASTM 316L (stainless steel, acid resistant).
- Designed according to USDA guidelines.
- Hygienic design making maintenance and cleaning simple.
- Deduster function with pre-separator solution.
- Smooth installation and easy to use.
- High throughput with a small footprint.

piFLOW®p

- A premium steel grade vacuum conveyor, designed to meet the requirements of high-demanding applications for chemical, food and pharma industries.
- In compliance with FDA, EC No. 1935/2004 and EC No. 10/2011.
- ATEX Dust and Gas certified.
- Steel quality ASTM 316L (stainless steel, acid resistant), mechanically polished.
- Designed according to USDA guidelines.
- Hygienic design making maintenance and cleaning simple.
- Smooth installation and easy to use.
- High throughput with a small footprint.
- Wide capacity range from 2 to 56 liters per conveying cycle (up to 15 tons per hour [30,000lbs/hr]).



piFLOW[®]fc

- Same heavy-duty design as the p- and t-series, targeting food and other industries not requiring acid resistant design of conveyors.
- In compliance with FDA, EC No. 1935/2004 and EC No. 10/2011.
- Steel quality ASTM 304 (stainless steel)
- Hygienic design making maintenance and cleaning simple.
- Smooth installation and easy to use.
- High throughput with a small footprint.



piFLOW[®]f

- An entry-level vacuum conveyor designed for industries where food grade quality, a dust free environment and easy maintenance are required.
- In compliance with FDA, EC No. 1935/2004 and EC No. 10/2011.
- ATEX Dust certified. Steel quality ASTM 304 (stainless steel)
- Smooth installation and easy to use.
- High throughput with a small footprint.

piFLOW[®]i

- A cost-effective solution for any industry, who wishes to automate the manual material handling process for improved throughput.
- ATEX Dust certified.
- Steel quality ASTM 304 (stainless steel)
- Smooth installation and easy to use.
- High throughput with a small footprint.



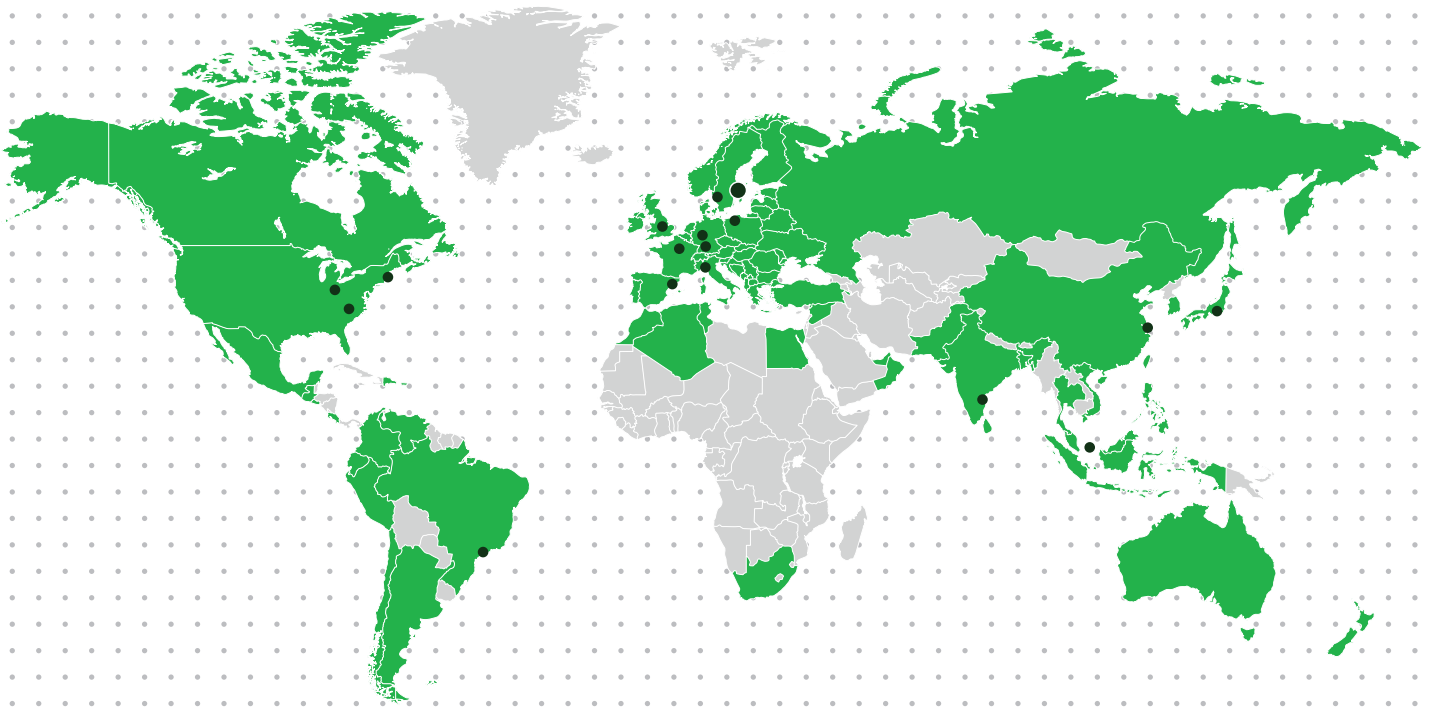
	SEGMENT	CAPACITY	INDUSTRY 4.0 READY	Sizes	CERTIFICATIONS
piFLOW [®] p SMART	Food, Chemical, Pharma	5 tons/hrs [11,000 lbs/hr]	●	5 - 33 liter	FDA* USDA**
piFLOW [®] t	Food, Pharma	2-3 milion parts/hrs****		10 liter	FDA* USDA**
piFLOW [®] p	Food, Chemical, Pharma, AM***	14 tons/hrs [30,000 lbs/hr]		2 - 56 liter	FDA* USDA**
piFLOW [®] fc	Food, Chemical, AM***	8 tons/hrs [17,000 lbs/hr]		3 - 33 liter	FDA* USDA**
piFLOW [®] f	Food	7.5 tons/hrs [16,000 lbs/hr]		6 - 28 liter	FDA*
piFLOW [®] i	General industry	7.5 tons/hrs [16,000 lbs/hr]		6 - 28 liter	

* All materials in contact with the conveyed product fulfill the requirements of FDA.

** piFLOW[®]p/t is designed according to USDA dairy guideline.

*** Additive Manufacturing

**** Parts e.g. chewing gums, candy, capsules



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