
AGIERRE
Engineering & Innovative Solutions

AGIERRE®
Engineering & Innovative Solutions

VTS - Vacuum Conveyor

VTS - Vacuum Conveyor (PED version)

VTS - Vacuum Conveyor Filtervac version

VTS - Vacuum Conveyor Hoppervac version

VACUUM TRANSFER SYSTEMS
FOR POWDER HANDLING




VTS – Vacuum Transfer System – Vacuum Conveyors

Vacuum Transfer System AGIERRE *provides an advanced solution for safe and efficient powder and granules conveying operations between processing, packaging equipment, and storage units.*

Applications: *Vacuum Conveyors are widely used in pharmaceutical, chemical, and food industries and serve various purposes, including charging/discharging materials to/from Bins, Drums, Hoppers, or other containers. They also facilitate the loading/unloading of mixers, reactors, fluid bed dryers and coolers, and dosing and packaging machines.*

Functionality and Operation: *The VTS works on the principle of vacuum suction generated by a Venturi pump, electric or liquid ring pump, or customer's central air system. A high-quality filter safely removes excess air and keeps the product inside the conveyor body, ensuring minimal contamination and maintaining product integrity. When accumulating enough product, the valve at the bottom of the Conveyor opens, allowing the material to discharge, and the filter cleans, allowing the process to repeat. Vacuum transfer allows powder handling at a low velocity (dense phase conveying), guaranteeing constant and consistent product transfer without causing shocks or de-mixing.*

Construction Materials:
- *AISI 304 steel;*
- *AISI 316 steel;*
- *Coated for use with corrosive powders.*

Connection between Body and Lid:
- *Tri-Clamp Connections;*
- *Wing Nut Connections;*
- *Flanged Connections (incl. UNI PN16 version).*

Filtration Systems:
- *Bag Filter;*
- *Pleated Filter*
- *Stainless Steel Filter;*
- *Titanium Filter;*
- *Hastelloy Filter.*

Control Panel Operation Logic:
- *Pneumatic;*
- *Electro-pneumatic;*
- *Electrical with PLC.*

Compliance with Industry Standards:
- *cGMP and FDA Guidelines;*
- *UNI EN ISO Standards;*
- *ATEX and Machinery Directives.*

Installed Vacuum Pump Options

Liquid Ring Vacuum Pump
Venturi Pump (Venturi Eductor)
Electric Vacuum Pump

CIP System (Clean-in-Place)

The Cleaning-in-Place (CIP) system is an automated washing solution specifically designed for integration with Vacuum Conveyors that allows for thorough cleaning of all internal components. Cleaning-in-Place reduces downtime by avoiding the need to disconnect and deliver the Conveyor to the washing area. After the cleaning cycle, the system dries the machine, permitting the Vacuum Conveyor to start transferring the next batch of the same or different product immediately.

The integrated cleaning system allows easy, efficient, and automatic washing of the Vacuum Conveyor's internal surfaces and filter units

Vacuum Transfer System	MINIVAC			STARVAC		
Model	AGR 150	AGR 200M	AGR 200	AGR 250	AGR 300	AGR 400
Volume (liters)	4,2	8	12	25	50	80
Diameter	150	200	200	250	300	400
Capacity (dm^3/h)	from 100 to 300	from 300 to 700	from 500 to 1200	from 1200 to 2500	from 2500 to 4000	from 4000 to 9000
Filter	P.T.F.E. bag filter, stainless steel AISI 316L sintered filter, Hastelloy, Titanium					
Materials (body, lid and valve)	Stainless stell AISI 316L/304, glazed, PTFE coating					
Control Console	Pneumatic, electropneumatic and with PLC functioning					
Internal finish	Mirror polished RA<0,4 micron					
External finish	Mirror polished RA<0,4 or satin RA<0,8 micron					
Gaskets	SILICONE / KARLEZ / VITON / PTFE / EPDM					

Basic Version (Dense Phase Conveying)

It is characterized by product suction using a vacuum. Once the Conveyor's body is full, a valve at the bottom opens, and gravity forces facilitate the product's discharge into the receiving equipment.

Overpressure Version

During product discharge, air or nitrogen gas is injected into the Conveyor's body, creating an overpressure environment and ensuring smooth product flow into the receiving container or machine.

Version with Inertization

The air is completely extracted from the Conveyor's body before introducing nitrogen gas , which eliminates any potential risk of fire or explosion, making it suitable for handling sensitive or hazardous products.

Bottom Valve

Customization Options:
At AGIERRE, we understand that each application is unique. That is why we offer personalized solutions to meet specific needs. Whether adapting to space constraints or integrating additional features, our Vacuum Conveyors can be adapted accordingly.

Handling Explosive Substances:
The VTS can safely transfer hazardous powders. During the discharge phase, the system maintains a residual oxygen level of less than 6% through an inertization process.

Installations & Applications

Vacuum Conveyor charging Bin from Several Big Bag unloading Structure

Vacuum Conveyor to load a Roller Compactor

Vacuum Conveyor on a Lifter for loading a plate Filter

Vacuum Conveyor on a arm for charging a solis

Vacuum Transfer System installed on Mobile Lifting Column

VTS - Vacuum Conveyor Filtervac version

Vacuum Conveyor type Filtervac *offers a material transfer solution for scenarios where direct installation on machinery is not feasible. Instead, tubes and pipes are used to connect the Conveyor to other equipment.*

Working Principle

The Filtervac generates a vacuum (negative pressure) within the receiving container or the machine, ensuring continuous product suction from the storage container or other equipment. The vacuum can be supplied to the Conveyor either by a pump installed on board or the customer's centralized air system to create the high vacuum values required for this VTS configuration. During the product aspiration phase, the Vacuum Conveyor regularly cleans the filter and collects residual material in a small container installed at the bottom of its body. At the end of the operation process goes a so-called "purge phase" in which the powder accumulated in this container is recovered either manually or automatically via a closed system using an aspiration hopper.

Customization Options

Design philosophy AGIERRE emphasizes Customer satisfaction. The VTS - Filtervac is available in a fixed version without wheels or can be mounted on a movable structure with antistatic wheels for ATEX applications, allowing easy positioning wherever needed. The Filtervac can be equipped of an automatic CIP (Cleaning-In-Place) or SIP (Steaming-In-Place / Sterilizing-In-Place) washing system that improves cleaning efficiency, prevents cross-contamination, and ensures product purity for the production process. All Vacuum Conveyors, including the Filtervac version, can be further customized to meet specific production process requirements.

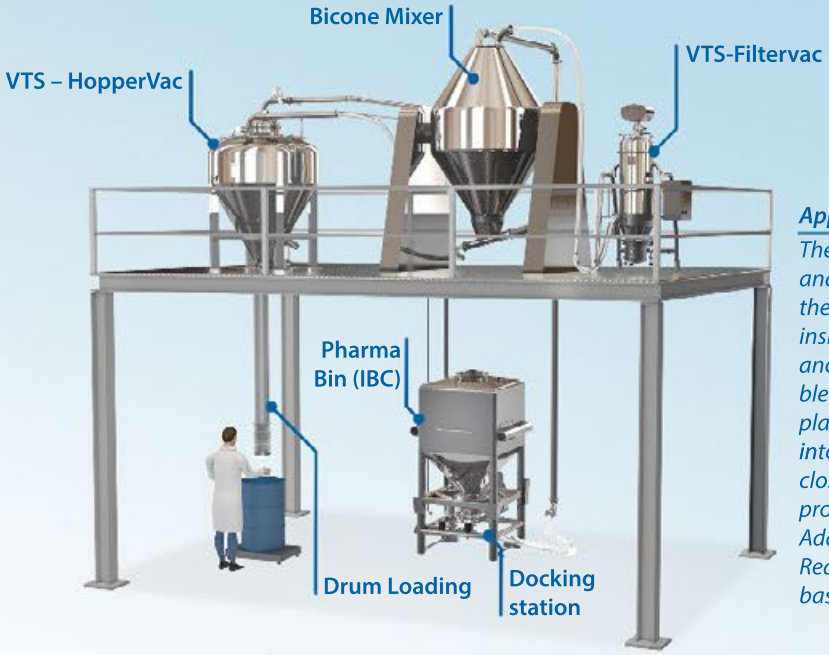
Compliance and Safety

The Vacuum Conveyor type Filtervac complies with cGMP and FDA guidelines, UNI EN ISO standards, ATEX and Machinery Directives, and other safety regulations.

Control Panel:
- Pneumatic;
- Electro-pneumatic;
- Electrical with PLC.

Filtervac FT400 PED 3bar with CIP and SIP for sterile applications

Filtervac FT250 PED 3 bar with CIP and SIP for mixer loading



Applications

The image to the left represents the system for conveying, blending, and dosing powders. The process starts by loading the Bicone from the Bin using a FilterVac Conveyor, which creates negative pressure inside the Bicone. It causes powder suction from one container into another due to the pressure difference. After the Double Cone Mixer blends the powder, it goes into the HopperVac Conveyor, which plays the role of a Controlled Dosing System for charging material into the Drums. All described operations are carried out through a closed system (Continuous Liner and Docking Station), preserving product integrity and eliminating contamination risks.
Additionally, VTS - FilterVac can be used for loading Mixers, Reactors, and other equipment where a flanged connection for the basic Vacuum Conveyor is unavailable or impractical.

Vacuum Transfer System	FILTERVAC			
Model	FT 200	FT 250	FT 300	FT 400
Volume (liters)	3	6	12	20
Diameter	200	250	300	400
Capacity (dm^3/h)	from 500 to 1200	from 1200 to 2500	from 2500 to 4000	from 4000 to 9000
Filter	P.T.F.E. bag filter, stainless steel AISI 316L sintered filter, Hastelloy, Titanium			
Materials (body, lid and valve)	Stainless stell AISI 316L/304, glazed, PTFE coating			
Control Console	Pneumatic, electropneumatic and with PLC functioning			
Internal finish	Mirror polished RA<0,4 micron			
External finish	Mirror polished RA<0,4 or satin RA<0,8 micron			
Gaskets	SILICONE / KARLEZ / VITON / PTFE / EPDM			

Filtervac FT200 for reactor charging

Filtervac FT400 for Bicone loading

VTS - Vacuum Conveyor - PED version

*The **Pressure Resistant Vacuum Conveyor** is a specialized Vacuum Transfer System designed to safely transfer bulk materials like powders, granules, and pellets into high-pressure (>0.5 barg) chemical reactors.*
Fully compliant with the Pressure Equipment Directive (PED) 2014/68/EU requirements, it is typically installed directly on the reactor to facilitate efficient charging into the vessel while preventing explosion and contamination risks.

Technical Characteristics

Manufacturing Materials: AISI 316L / AISI 304 / Acid and Corrosion Resistant Coating;
External and Internal Finish: Mirror-polished / Coated;
Connection between Body and Lid: Flange / Wing Nut;
Control Panel Operation Logic: Pneumatic / Electro-pneumatic / Electrical with PLC;
Supported Pressure: from -1 to +3 barg / from -1 to +6 barg.

Compliance and Safety

- *cGMP and FDA Guidelines;*
- *UNI EN ISO Standards;*
- *ATEX 2014/34/EU and Machinery Directive 2006/42/EC;*
- *Pressure Equipment Directive (PED) 2014/68/EU.*

Customization Options

These Pressure Resistant Vacuum Conveyors can be integrated with CIP (Cleaning-in-Place) and SIP (Steaming-In-Place or Sterilizing-In-Place) systems to meet specific hygiene and sanitation requirements. This type of Vacuum Conveyor is named GMA.

PATENTED

CIP System (Clean-in-Place)

The integrated cleaning system allows easy, efficient, and automatic washing of Vacuum Conveyors

Ferrule of vapour collector

Through the Ferrule of Vapor Collector, the Vacuum Conveyor can be installed directly on reactors and/or dissolvers even with both solvents and vapor at 100 °, thanks to a double cavity wall structure that creates a laminar flow barrier. It traps the vapor rising from the reactor towards the inlet point. This system prevents any product accumulation on the discharge valve of the Vacuum Conveyor installed on the reactor, simplifying the product discharging phase.

Nitrogen laminal flow

Vacuum Transfer System	MINIVAC	STARVAC		
Model	AGR 200 PG	AGR 250 PG	AGR 300 PG	AGR 400 PG
Volume (liters)	12	25	8	80
Diameter	200	250	300	400
Capacity (dm^3/h)	from 500 to 1200	from 1200 to 2500	from 2500 to 4000	from 4000 to 9000
Filter	P.T.F.E. bag filter, stainless steel AISI 316L sintered filter, Hastelloy, Titanium			
Materials (body, lid and valve)	Stainless stell AISI 316l /304, glazed, PTFE coating			
Control Console	Pneumatic, electropneumatic and with PLC functioning			
Internal finish	Mirror polished RA<0,4 micron			
External finish	Mirror polished RA<0,4 or satin RA<0,8 micron			
Gaskets	SILICONE / KARLEZ / VITON / PTFE / EPDM			

Installed Vacuum Pump Options

Liquid Ring Vacuum Pump
Venturi Pump (Venturi Eductor)
Electric Vacuum Pump

Overpressure Version

This configuration generates overpressure during discharge by injecting air and inert gas (such as nitrogen) into the system to prevent clogging and enhance safety by creating an inert environment during product unloading.

Version with Inertisation

The air is completely extracted from the Conveyor's body before introducing nitrogen gas, which eliminates any potential risk of fire or explosion, making it suitable for handling sensitive or hazardous products.

Coated Vacuum version

It is used for conveying acidic, corrosive, and aggressive powders. Coating Materials: Blue Armor; Halar ECTFE; PFA; SR60EX Antistatic Halar ECTEFE; SR65 Ivory White.

INSTALLATIONS & APPLICATIONS

VTS model AGR400 for reactor loading at a height of 10 meters with a capacity of 800 kg/h.

Coated VTS model AGR300KK for acid and aggressive powders

Coated VTS model AGR250KK for reactor loading with solvents and acids.

VTS model AGR300 PED PN 6 for API loading

VTS model AGR250KK PN6 for reactor loading from Glove Box OEB4 for API

VTS - Vacuum Conveyor Hoppervac version

Vacuum Conveyor type Hoppervac *combines the capabilities of a Vacuum Transfer System with a storage unit, offering versatility in industrial settings. With its increased capacity to accumulate products within its body, the Hoppervac provides a comprehensive solution for conveying, storing, and dosing powders.*

Applications

The Hoppervac finds extensive applications across pharmaceutical and chemical industries, excelling in scenarios requiring material transfer, accumulation, and subsequent processing equipment loading. Its versatility allows it to handle active ingredients, raw products, powders, and granules for machines such as tablet presses, capsule fillers, coating machines, reactors, mixers, granulation systems, extruders, packaging lines, blenders, mills, dryers, and filling stations, making it an invaluable solution for diverse industrial processes.

CIP System Integration

For optimal hygiene and ease of operation, the Vacuum Conveyor type Hoppervac offers the option to integrate a Cleaning-in-Place (CIP) system. This automated system thoroughly cleans all filters and internal surfaces, minimizing downtime and ensuring compliance with strict regulations. The CIP system eliminates the need for disconnecting the machine and taking it to the washing area, allowing for the Hoppervac cleaning in place. After the cleaning cycle, the system dries the internal components, permitting Hoppervac to start transferring the next batch of the same or different product immediately.

AGIERRE VTS - Hoppervac is made entirely of AISI 316L stainless steel and features an innovative design preventing any product or liquid residue from accumulating anywhere inside the Conveyor body.

Vacuum Transfer System	HOPPERVAC						
Model	HPV800	HPV1000	HPV1200	HPV1400	HPV1500	HPV1800	HPV2000
Volume (liters)	300-500	520-820	760-1160	1150-1750	1800-2600	2400-3400	3000-5500
Volume for product (liters)	200-400	400-700	600-1000	900-1500	1500-2300	2000-3000	2500-5000
Diameter	800	1000	1200	1400	1500	1800	2000
Capacity (dm^3/h)	2000 to 9000	3000 to 9000	3000 to 20000	3000 to 20000	3000 to 20000	3000 to 25000	3000 to 30000
Filter	P.T.F.E. bag filter, stainless steel AISI 316L sintered filter, Hastelloy, Titanium						
Materials (body, lid and valve)	Stainless stell AISI 316L/304, glazed, PTFE coating						
Control Console	Pneumatic, electropneumatic and with PLC functioning						
Internal finish	Mirror polished RA<0,4 micron						
External finish	Mirror polished RA<0,4 or satin RA<0,8 micron						
Gaskets	SILICONE / KARLEZ / VITON / PTFE / EPDM						

Coated Hoppervac

Functionality and Operation

The VTS type Hoppervac can be powered either by an electric or liquid ring pump or a customer's centralized air system. Hoppervac Conveyor operates on the same working principle as a Standard Vacuum Conveyor, ensuring reliable and consistent product suction. During operation, the product is aspirated into the Hoppervac's body, where it accumulates for later use as a storage or dosing unit. The butterfly or pneumatic rotary valve regulates its discharge process via a control panel.

Compliance and Safety

The Vacuum Conveyor type Hoppervac adheres to stringent cGMP and FDA guidelines, UNI EN ISO standards, ATEX and Machinery Directives, and other relevant safety regulations, ensuring reliable and secure operation.

Hoppervac with CIP System

INSTALLATIONS & APPLICATIONS

Hoppervac with CIP System to charge Drums in OEB4 containment for Pharma Application

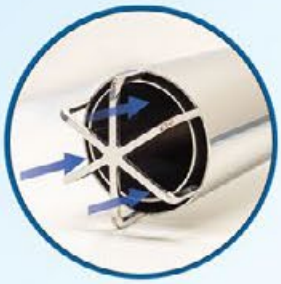
VTS Hoppervac for powder dosing system to charge a mixer

Vacuum Conveyor Hoppervac on a fixed column which discharge in drums

VTS Hoppervac with integrated washing system for chemical application

Jacket Hoppervac in sterile area

Suction Lance



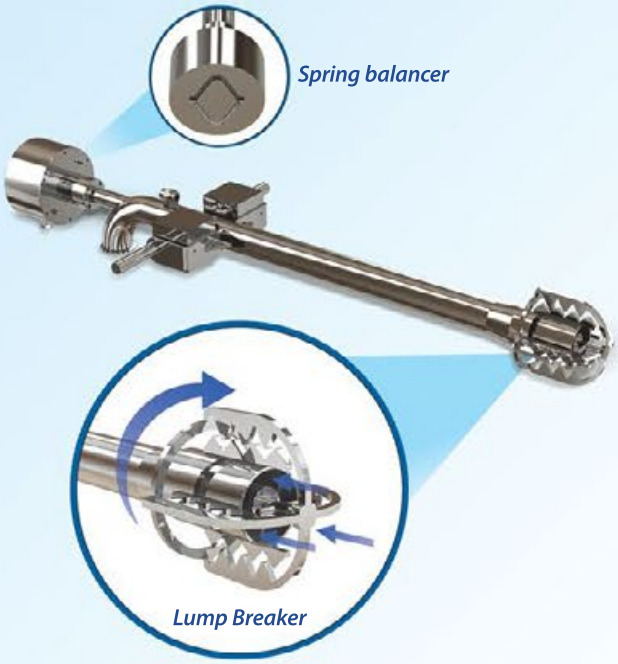
AGIERRE's **Standard Suction Lance** is designed for efficient powder granular material aspiration from drums, bags, tanks, and other containers. This equipment is manufactured from AISI 316L/AISI 304 stainless steel, with both internal and external surfaces being mirror-polished.

Applications: It is used in the chemical, pharmaceutical, and food industries, providing an alternative solution to product discharge by gravity, eliminating the need to tip the drum or bag. It is also useful for scenarios where direct installation of a VTS - Vacuum Transfer System on a material storage container is impossible or impractical.

Configurations: The Suction Lance is available in single or double-tube versions. The latter can be equipped with a quick coupling for the fluidization system, maintaining the correct air/nitrogen ratio for fluid dynamic balance. It prevents bag blockage/clogging during the suction phase.

Compliance: The Suction Lance is manufactured under cGMP guidelines, UNI EN ISO norms, and all relevant safety regulations.

Lump Breaker Lance



AGIERRE's **Lump Breaker Lance** is an enhanced Suction Lance configuration specifically designed to suck humid powders prone to clumping into large pieces that would otherwise get stuck in the standard version. The equipment is manufactured from AISI 316L stainless steel with a mirror-polished finish on internal and external surfaces.

Working Principle: Being connected to a Vacuum Transfer System, the basic operation is similar to the standard configuration. In addition, an integrated lump crusher breaks up any hardened clumps formed in the material, facilitating product extraction from the storage container without any blockages.

Features: The Lump Breaker Lance consists of a metal suction tube equipped with a rotating lump breaker at the inlet. A double-acting pneumatic actuator drives the rotating crusher element through 0-180 degrees, breaking up solidified material. The lance also has a coupling for a spring balancer attachment, needed to support it in the absence of weight.

Compliance and Customization: The equipment is produced according to cGMP, UNI EN ISO, and safety standards. AGIERRE can customize its Lump Breaker Lance to meet the specific production process requirements of the Customer.

Suction Lance connected to a drum with a cap, thus creating a closed system preventing the product from escaping into the working area

Lump Breaker Lance with spring balancer