



VACUUM-CONVEYING





VOLKMANN GmbH was founded in 1973 as a consulting firm for automation and economical production. Since 1979 Volkmann have built up its own innovative product range in the field of vacuum technology. Many inventions, protected by patents, confirmed Volkmann to be a leading manufacturer of Vacuum Conveyors, Vacuum Pumps and Vacuum Components. These have been designed specifically to suit a wide range of duties and have set new benchmarks in relation to economy, quality and cost-performance-ratio.

The basis of this success has been the continuous development and innovative approach taken to satisfy the ever increasing variety of applications. Many of our products have become trend-setters in international industries, with high demands on special technical requirements.

Though the Volkmann company is growing rapidly and setting up a global network of agencies, associated partners and distributors, our principles and our relationship to customers are still guided by the vision of a family owned "German Mittelstand" business, where flexibility, quick actions and decision making come first and go hand in hand with superior quality and precisely engineered products. Clients are delighted by our quick reaction and delivery times. Our modern CNC machinery, our stainless steel manufacturing and welding expertise and our special machinery production facility enable us to offer bespoke solutions to our customers via individually adapted systems. The work of our engineers is supported by modern 3D-CAD systems.

It is our pleasure to provide some ideas and suggestions on how Volkmann Vacuum Conveying systems can improve your company processes and where you will profit and benefit from applying the Volkmann technology. Talk to us about your special needs in the field of Vacuum Conveying.

Reference Materials and Products

Chemicals

Activated carbon dust
Aluminium chlorine
Aluminium hydroxide
Bentonite
Calcium carbonate
Calciumhydroxide
Clean sand
Diatomite
Dicyanodiamide-powder
Dutral TER 4038 PL
Ferrocene
Flame soot (Printex 80)
HBMCG (NaCN)
Hexamethylenetetramine
Humid activated carbon coke
Hydroxy ammonium sulphate
Isophthalic acid
Iron powder
Mowital
Silicon carbide
SiO₂
Silicon powder
Sodium azide (powder)
Sodium carbonate (Na₂CO₃)
Sodium nitrate
Sodiumbisulfate
Stearic acid
Sulfamic acid
TiO₂
Washing-powder perls
Zeolite
Zinc stearate

Plastics

Dental pearls
PE-PP-caoutchouc
Polyethylene granule
Polystyrene grain stock
Polyurethane granule
Recycled duroplastic
Yestyron (sharp edged)

Food

Aroma powder in carrier
Bacon
Baking agent
Beans
Chanterelles
Cheese powder
Chicken wings
Chocolate chunks
Cinnamon
Cocoa
Coconut rasps
Coriander
Cream-fat-powder (75% fat)
Crystal sugar
Curry
Dextrose
Dog food (rings)
Energy drink powder
Fruit jelly granule
Fruit powder
Ginger
Lactose
Lucerne flour (Alfalfa)
Millet
Pepper
Rice
Sauerkraut
Sugar
Sugar powder
Tea (different types)
Tobacco powder
Tricalciumphosphate
Trigalol
Wheat starch
White cabbage
Yeast

Pharmaceuticals

Agiolax (laxative)
Ascorbic / citric acid mix
Ascorbic acid powder
Barium sulphate
Cellulose powder
Coal granule
Colistin sulphate
Filter cake (Chem.+Pharma)
Garlic powder
Laxative granule
Magnesium
Pankreatin
Paracetamol powder
Placebo preparation
Potassium bicarbonate
Sodium bicarbonate
Sodium citrate (dry + humid)
Sorbitol
Vegetable drugs
Vitamin preparation

Colours and coatings

Decoration dye powders
Dibromonitroaniline
Duroplastic coating powder (dye powder)
Dye powders (diacetahile yellow etc.)
Epoxy resin
Styrolene / acrylate polymer
Teflon powder
Titanium dioxide
Toner powder

Metal powders

Aluminium powder
Cobalt metal powder
Iron powder
Magnesium chips
Metal crystals
(Cu/Pb/Sb/C/Sn)
Palladium ashes
Silver powder
Steel granule
Strontium ferrite powder
Tantalum metal powder
Wolfram-metal powder
Zinc powder

Small parts

Plastic closing caps
Pharmaceutical parts (FDA)
Glass hollow parts
Explosive propellants
Pharma capsules
Round battery cells

Other

Bio filter stuff
Cement clinker
Corundum/corundum mix
Electronic parts (recycling)
Garden mould
Grape pips
Gypsum
Gypsum (for prothesis fabrication)
Iron oxides, wood granule and minerals (casting auxiliary)
Lava slag
Micro glass balls
Pearl soot
Pebbles
Piezo mass
Quartz granule
Quartz powder
Sand-lime-mix
Silica
Welding powder



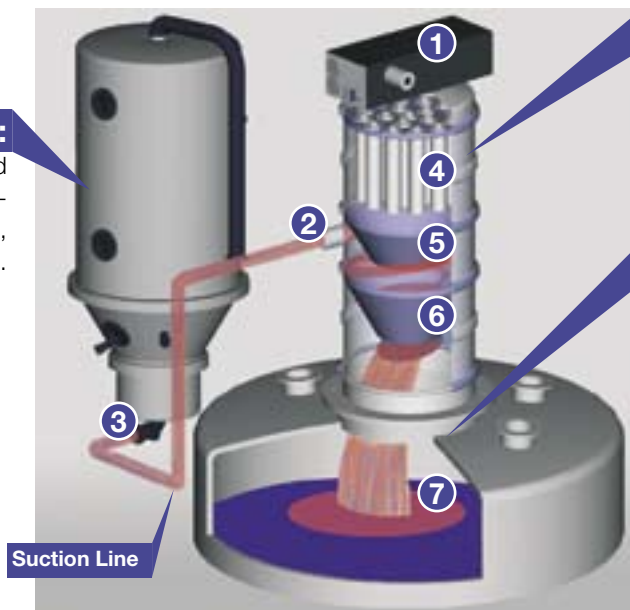
How Vacuum Conveyors work

How Vacuum Conveying works

5

Suction out of / from:

All Materials can be aspirated directly out of / from production- and process machines, bins, bags, containers ...



Vacuum Conveyor

The material to be conveyed is aspirated in suction cycles into the separator container and discharged from there by gravity into the process to be fed.

Feeding into:

The transported material is loaded in cycles from the top into the bin or process machine.

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MULTIJECTOR®
Vacuum Pumps

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Vacuum Conveyors from VOLKMANN transport the most diverse materials such as powder, dust, pigments, flakes, granulated material, tablets, capsules, small parts etc. in a suction air stream under vacuum through hoses or pipes. From fine dust with only 0.1 µm grain size up to plastic caps for medical infusions. From the lightest filling agents with only 0.05 kg/m³ up to metal powders with bulk density 10 and above. They are easy to install and operate. Even if leakages occur, no product can get into the environment because of the vacuum. See the variety of materials with which Vacuum Conveyors can be used in different industries. And this is just a brief overview.

Operation

1. The vacuum pump (1) generates a vacuum in the Vacuum Conveyor's separator tank. Air rushes in through the hose/pipe and the suction inlet (2) from the feeding point (3). The bulk material is aspirated and then carried in this air stream.

2. Inside the separator tank a filter module (4) separates air and product. The transported material is kept and collected in the separator. For fine dust a cyclone element (5) inserted into the separator provides higher transportation capacities due to the reduced load of the filter elements.

3. When the separator is filled with product, the vacuum pump switches off, within the vacuum conveyor the pressure is balanced to surrounding area within tenths of a second. The separated material discharges from the vacuum conveyor through the discharge element (6) and falls directly into the unit or tank to be charged (7).

4. During discharge of material, the filter module is cleaned automatically by an air shock system. The occasional filter cake is released from the filter unit. Volkmann offers piston vibrators and fluidizing units to improve discharging of sticky or highly bridging bulk materials.

5. After unloading the product the discharge element closes and the complete conveying cycle repeats.

Conveying capacities:
20 – 10000 kg/h (44 to 22000 lbs/h)
up to 35 m high (115 ft)
and 80 m distance (280 ft)

Advantages of Volkmann Vacuum Conveyors

- dustfree material transfer, gentle to the material
- reliable, low weight systems
- little need for maintenance
- almost no wear in the entire process
- easy installation and control
- recommended for all types of bulks: from powder, pigments, dust and granulated material to small parts; flowing/bridging/sticky/inflammable/toxic ...

VOLKMANN Vacuum Conveyors

- for the Chemical Industry: durable and safe
- for the Pharmaceutical Industry: certified materials and highest hygiene
- for the Food Industry: hygienic at an attractive price
- for the colors and lacquer industry: quick and complete cleaning
- ATEX certified conveyors available



Our Mission:

We help worldwide users cope with their daily tasks with safe and clean handling of even sensitive and critical bulk materials within demanding environments.

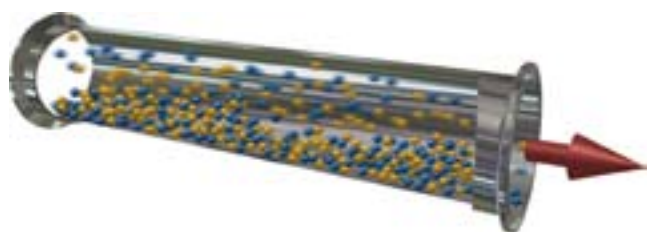
Conditions inside the transportation line

The total pressure difference in the transportation line essentially results from the quantity of the material to be conveyed in the line, its flow characteristics, the conveying height and the design of the product loading element and transportation line. The vacuum pump must be able to overcome the total pressure loss inside the conveying line and at the same time to produce the flow rate necessary for the transport of the material (volumetric air flow related to the transportation line cross section). It is important to provide a sufficiently high measure of additional conveying air into the product ("secondary air") and/or the transportation line to establish a stable conveying process. By the regulation of this secondary air one can easily affect the desired condition in the transportation line of a Vacuum Conveying system, in order to transport e.g. the material particularly carefully, to avoid high electrostatic loadings or work against the angelhair effect of plastics. Inside the transportation line three different conveying conditions can be found:



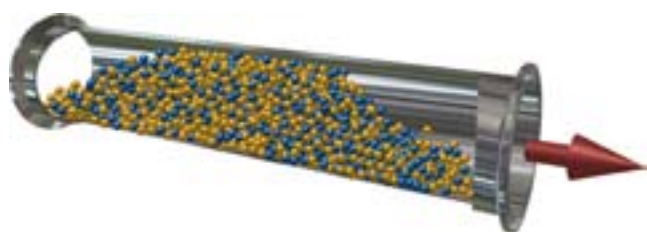
Flight conveying

At flight conveying the air speed w is substantially larger than the v_s of the conveyed materials particle, where w is approx. 18 to 35 m/s. The loading ratio of the conveying air is quite small. Depending on the characteristic of the selected vacuum generator, flight conveying usually provides the largest transportation capacities. However, to prevent particle abrasion or grain destruction, sensitive materials should not be conveyed at high speeds.



Dilute phase conveying

As the air velocity w is reduced to a value under 20 m/s during horizontal or diagonal transportation the conveyed material drops progressively into the lower half of the transportation line. This results in more material moving slowly on the bottom of the transportation line while above the bottom sediment a changing number of particles are conveyed at higher speeds. The manner in which dilute phase conveying occurs is strongly dependent on the products characteristics. In dilute phase conveying one often finds areas where plugs can build up (e.g. at the entry of pipe bends) or where regular flight conveying occurs in the top half of the pipes. The material at the bottom of the pipe reduces the transportation lines area and causes a speed increase of the conveying air at certain points. The relationship of the materials speed v to air speed w is smaller than 0.7. The loading inside the transportation line usually is higher than at flight conveying. Vacuum Conveyors, which are adjusted to the dilute phase conveying, offer a very smooth and gentle handling of the material as well as the most energy efficient form of vacuum conveying.

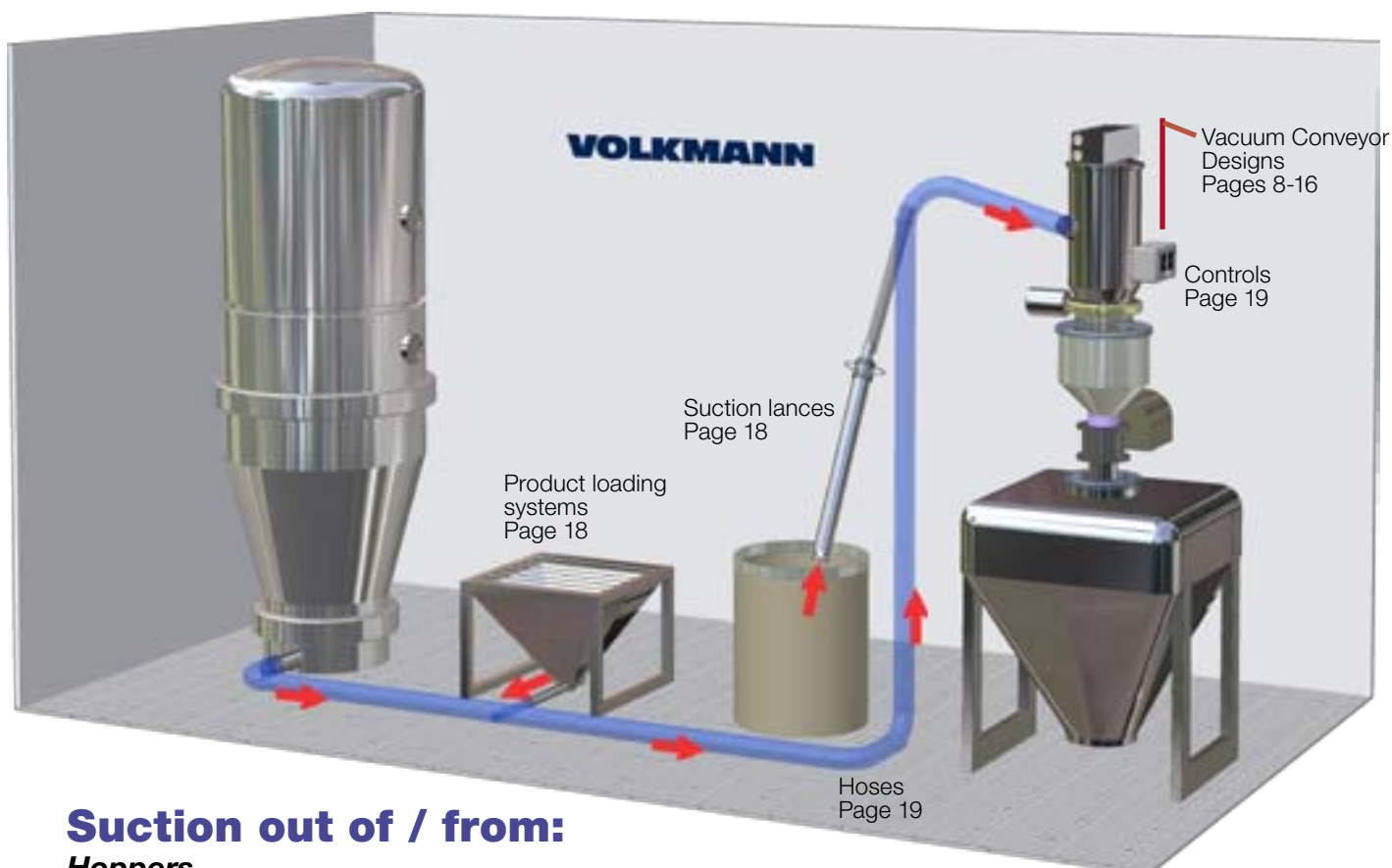


Plug conveying (dense phase conveying)

If the product load of the transportation air is increased and the air speed reduced, plugs build up inside the conveying line. These plugs continuously build up and disintegrate over the entire conveying length. Reliable working Vacuum Conveying systems can be realized with air speeds w far below the floating speed v_s of the single grain (v_s is the air speed required to suspend a particle in a vertical suction pipe). Plug conveying is usually the most gentle transportation method for sensitive materials. For plug conveying the vacuum generator should be able to produce high vacuum levels much above those of e.g. blowers. This prevents the blocking of the transportation line. Air speed w lies between 3 and 10 m/s, whereby the ratio of material velocity to transportation air speeds is below 0.5. The product flow-rate can be up to one hundred times larger than the air flow-rate (both in kg/h). Energetically, plug conveying and dilute phase conveying are comparable, since the necessary volumetric air flow is substantially smaller, but the pressure difference rises. Plug conveying is not only applicable with powders and granulates, but also for the transport of viscous or liquid media.

VOLKMANN Vacuum Conveyors are the preferred choice in Industries, which commit themselves to ...

- ... high hygienic demands for all material transfer equipment*
- ... daily/regular cleaning and easy disassembling of all parts with material contact*
- ... high efficiency production processes and operational safety*
- ... preventing explosion risks and being in control of all processes*
- ... state-of-the-art production equipment with outstanding quality and reliability*



Suction out of / from:

Hoppers
Big-Bags / FIBCs
Silos
Drums
Bags/Liners
Kiln sheets
Strips
Dryers
Cutting Machines
Floors
Moulds
Centrifuges

Feeding directly into:

Mixers / Blenders
Reactors
Filling Machines
Weighing Hoppers
Sieves
IBCs
Tablet Presses
Big-Bags/FIBCs
Bag Fillers
Drums
Silos

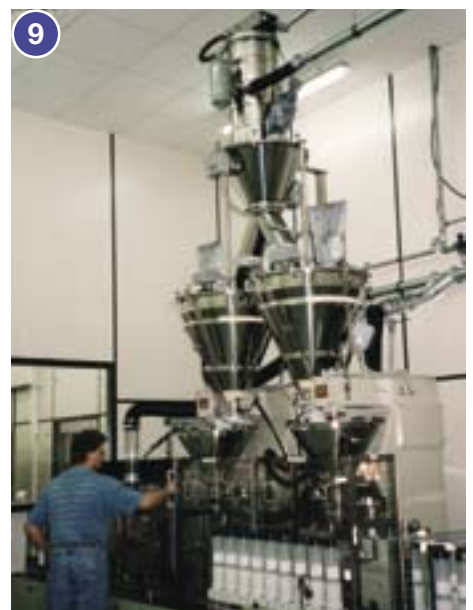




Fig. 1: Filling of a mixing and a reaction vessel with flame soot, manganese dioxide and calcium carbonate. Continuously working tandem Vacuum Conveyor.

Fig. 2: Emptying of a dryer with a suction wand, subsequent sieving, and filling of a container.

Fig. 3: Filling of a tablet press with two Vacuum Conveyors VR315 in a special flat design; Pumps externally installed.

Fig. 4: Vacuum Conveyor VR450 mounted on a silo, 35 m conveying height; Pump externally installed.

Fig. 5: Filling of a mixer with a PPC Vacuum Conveyor; Transportation of Paracetamol powder from a barrel via a suction wand.

Fig. 6: Vacuum Conveyor VR450 for the mobile use; installed on a mobile hoist, adjustable height.

Fig. 7: Manual suction of high quality palladium ash from an oven tray and collection in barrels.

Fig. 8: Filling of a reaction vessel / mixer in a Pharma Process.

Fig. 9: Filling of toner powder into cartridges with a Vacuum Conveyor VR315.

Fig. 10: VR450 Vacuum Conveyor with weighing/dosing function for proportioned reactor filling, automatic batch dosage.

Fig. 11: Vacuum Conveyor for the transport of a sugar mixture into a rotation coater; to the coating of candies.

Fig. 12: Vacuum Conveyor with powder-lock function for the feeding of pigments in the dye/color industry. The pigments are transferred into a solvent atmosphere.

Fig. 13: Two Vacuum Conveyors for the filling of loss-in-weight feeders.

Fig. 14: Vacuum Conveyor for the batch feeding of pigments in the paint industry.

Fig. 15: Vacuum Conveyor for the automatic discharging of a fluidized bed dryer. Product delivery through an submer-sion tube into IBCs.





Frequently various production processes are handled by a single conveyor. This conveyor is therefore responsible for the handling/loading of the differing powders or granulates, e.g. in chemical process technology or in the color and lacquer industry, where different colors and dyes are to be transported. In such applications the design of the Vacuum Conveyor should permit easy disassembly and cleaning.

At the same time the selected container material must be resistant against cleaning agents and aggressive chemicals. For this reason the **stainless steel modular design** was chosen, ensuring rapid product change on the one hand, and fulfilling the high requirements for hygiene with chemical, pharmaceutical and food applications on the other. Additionally, the modular design allows individual customization of the conveying system as required. A typical example is the design of the suction inlet in a radial or tangential configuration, which can substantially influence the entire conveying process.

Tangential suction connections are chosen for reducing the filter load, e.g. if fine powders like TiO₂ or toner powder are conveyed. The separating effect of the cyclone can be supported by inserting a funnel (so-called cyclone-insert). However, the danger of the separation arising by the centrifugal energy should be considered when conveying powders with a large particle size distribution. This could be a problem e.g. within chemical/pharmaceutical applications, where substrate and active substance must not be separated.

In such cases, and in cases with adhering/sticky material, the **radial suction connection** is the better choice, since it does not flow over the larger areas of the separators interior surface. The material cannot build up on the wall and the mixture remains homogeneous due to turbulence similar to a fluid bed. The filter load is larger with the radial suction inlet requiring compensation, in some cases, by more frequent emptying and cleaning cycles, lowering the suction capacity of the conveyor. The best application oriented configuration of the Vacuum Conveyor and its modules can be found by suction trials.

In connection with our Multijector vacuum pumps particularly small Vacuum Conveying systems are available, these can be used both stationary or mobile. Since high vacuum levels might occur during plug conveying, our Vacuum Conveyors all are vacuum proof for pressures down to -0.91 bar (= 9 m = 350 inches water column).

In accordance to the size of the Separator Container, its suction inlet, the chosen filter and vacuum pump, a certain transportation capacity is reached. The filling volume per suction cycle is constant, the transportation capacity depends strongly on the bulk density and other properties of the conveyed material, as well as on the feeding situation of the transportation line.



Advantages of **VOLKMANN** Vacuum Conveyors – **Your Customer Benefit**

- unique modular design with Clamp rings
- units easily dismantled and cleaned
- suitable for GMP applications
- superior filter-technology for vacuum conveying with different “Best-in-Class” designs available
- individual custom made adaptations to fit the specific application
- highly effective Multijector Vacuum pumps
- no heat emission
- quiet and reliable operation
- lightweight and compact size
- process engineering and support directly from the manufacturer

Volkman Vacuum Conveyors:

VOLKMANN Vacuum Conveyor designs



Modular Vacuum Conveyors: The VR-Series

The most flexible Vacuum Conveyors available. Easy adaptations to fulfil the requirements of almost all industries. See page 10.



Vacuum Conveyors with one-piece separator elements: The PPC-Series Their gap free and all accessible design, as well as their absolute minimum of parts with product contact, make our PPC Vacuum Conveyors the first choice for the Pharma and Paint/Lacquer industries. See page 12.



Pressure-proof Vacuum Conveyors

Secure feeding of solids into critical areas. Particularly for Chemical and Pharma Industry. Vacuum Conveyors with modified atmosphere function (inerting). See page 14.

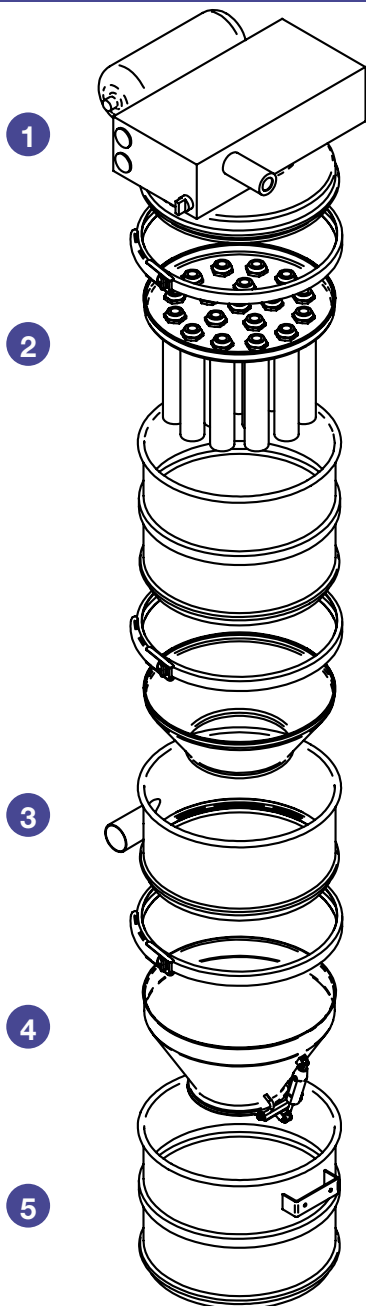


Tablet Conveyors with Glass Separator

Careful transportation of sensitive tablets and other sensitive products with our transparent Vacuum Conveying system. See page 16.

*Similar to Volkmann
will never be like Volkmann.*

Ideal technology for each application.

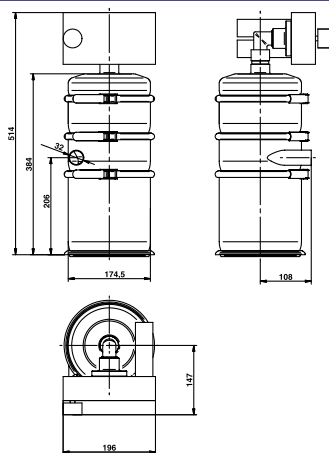


The modular design; shown for the Vacuum Conveyor VR315T

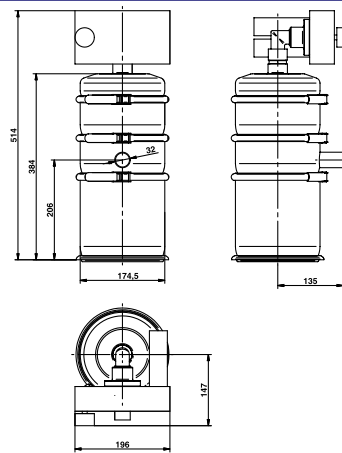
- 1 Pump-Cover-Combination with the air-shock system for filter cleaning
- 2 Filter module
- 3 Suction module
- 4 Discharge module
- 5 Base module

A huge variety of different functional modules is available for each VR Vacuum Conveyor. The VR series offers millions of possibilities.

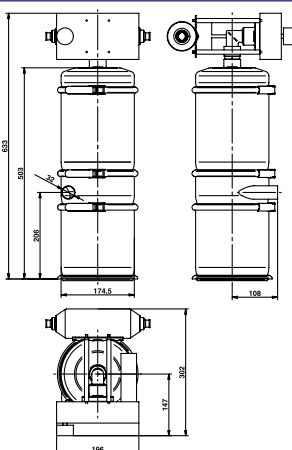
This is only a small selection from our VR Vacuum Conveyor program – we are glad to assist you in making your choice for the best conveyor for your application. More detailed information, data sheets and quotations with sketches available upon request.



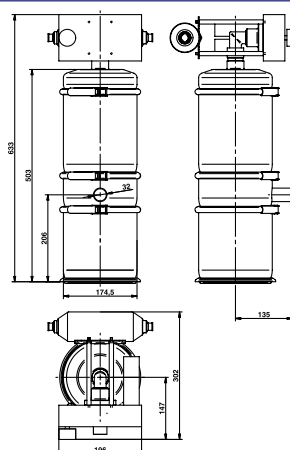
Vacuum Conveyor VR170T-F60
Article No. 101.463



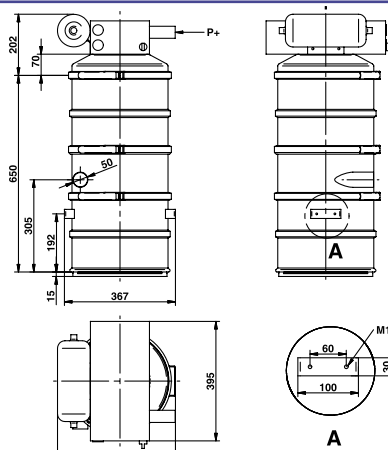
Vacuum Conveyor VR170R-F60
Article No. 101.464



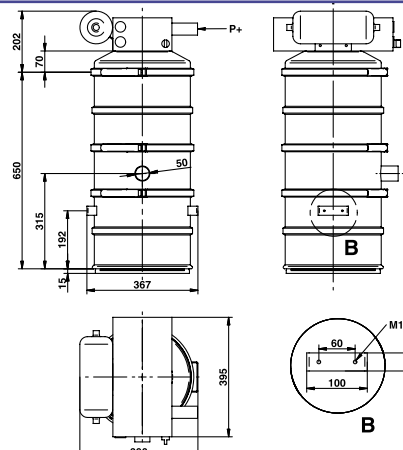
Vacuum Conveyor VR170T-F200
Article No. 101.467



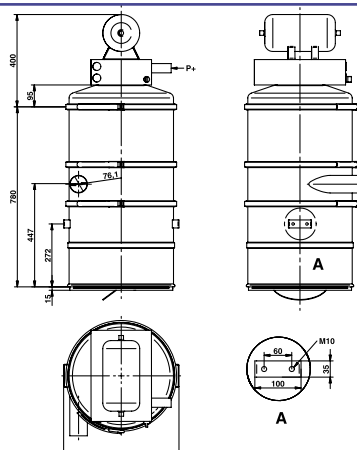
Vacuum Conveyor VR170R-F200
Article No. 101.468



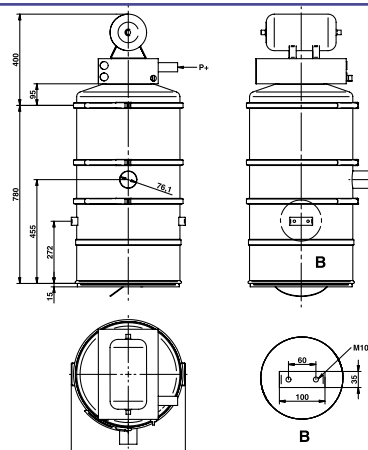
Vacuum Conveyor VR315T
Article No. 101.455



Vacuum Conveyor VR315R
Article No. 101.456



Vacuum Conveyor VR450T
Article No. 101.471



Vacuum Conveyor VR450R
Article No. 101.472



VOLKMANN VR-Standard Vacuum Conveyors
Your Customer Benefit

- State of the art Filter technology
- no compacting of the powder inside the conveyor
- easy product discharging
- capacities from 100 to 4000 kg/h
- purely pneumatic powered systems with failsafe controls
- electrical Vacuum Pumps upon request
- valves/fittings/instruments/controls according to your instructions

The star of the vacuum conveyors because of its unique modular design. The VR series is used in all industries where bulk materials are conveyed. Small and lightweight they come with many options to choose from to fulfill the demand for a high quality conveyor at a fair price and with quick delivery times (typically 2-3 weeks).

We configure all VR Conveyors to give the highest benefit for the production process and help to find the best suitable solution for the application on the basis of know-how, our product database or custom tests with the particular material.



Separator system

- Four sizes: Ø170, Ø250, Ø315 and Ø450 mm
- modular container elements with light clamp rings
- all modules lightweight, easy dismounting and cleaning
- stainless steel AISI 304 (AISI 316 L as option)
- surfaces finish - ground (Ra < 0.8 µm) or polished
- additional coatings according requirements

Integrated filters

- modular filter-elements, lightweight, easy access
- sintered HD-PE filter candles (5 µm), long lasting
- polyester fabric teflonized filter cartridges (0,1 µm)
- stainless steel filters
- filters for hazardous / unhealthy materials
- antistatic filters
- filterbags with Teflon-membrane

Integrated filter cleaners

- back blow air shock systems

Suction modules

- suction diameters Ø 19-100 mm
- radial suction modules with check valve
- tangential suction modules with cyclone insert
- Clamp connections as required

Discharging modules

- large diameters for discharging
- active (cylinder) and passive (gravity balanced) discharge modules with flaps
- butterfly valves with large discharge diameters
- fluidizers and piston vibrators for improved product flow
- valves and adaptations according requirements

Connectors for discharging

- flat or cone flanges
- collector tanks with liquid-release
- fabric connectors, submersion tube elements
- individual adaptations and system integration

Vacuum pumps

- more than 50 MULTIJECTOR® types for Vac.Con.
- Multijectors completely in stainless steel (CIP-ready)
- electrical vacuum pumps as required

Controls

- very small pneumatic controls
- automatic level detector control systems
- preparation for SPS/PLC-controllers

Accessory

- suction wands and balancers for manual use
- product feeding stations
- suction hoses and pipes
- frames for wall mounting, special attachments
- trolleys and lifts for mobile use of the conveyor

All new VR Conveyors are ATEX certified in accordance with directive 94/9/EG for the installation inside Zones 1, 2, 21 and 22. EC-type examination certificate No. TÜV 02 ATEX 7005X. For safe operation special terms/conditions apply.
[Ex] II 1 D c 80°C / II 2 GD c 100°C (T4)



**Vacuum Conveyor VR: Proven reliability,
in thousands of applications.**

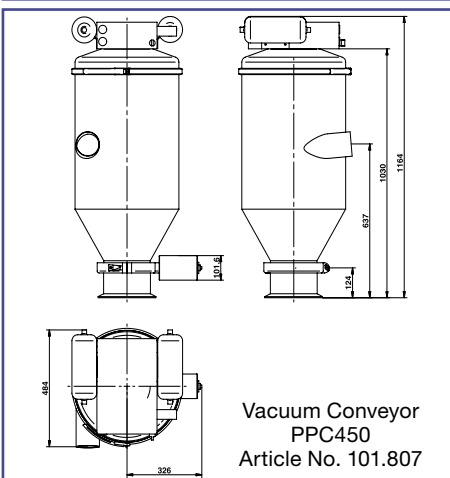
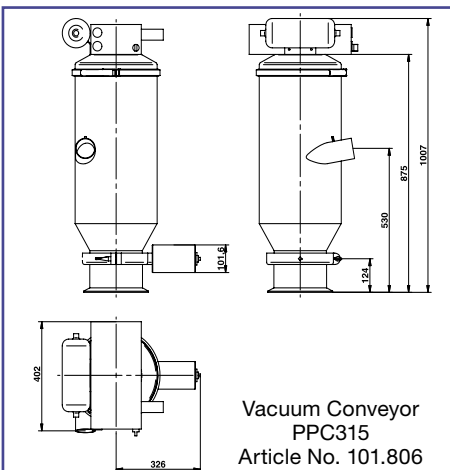
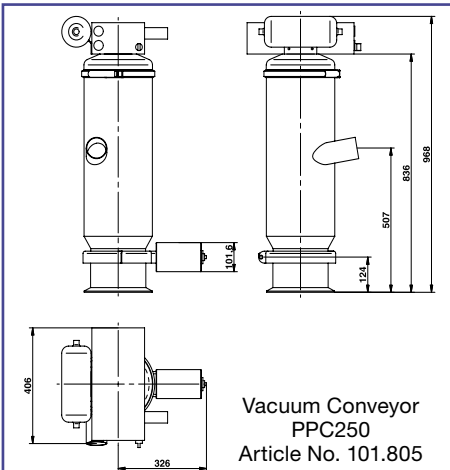
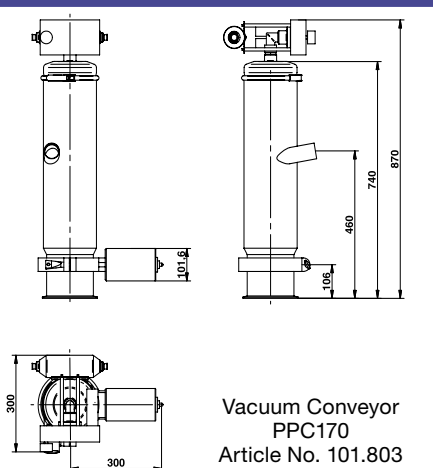
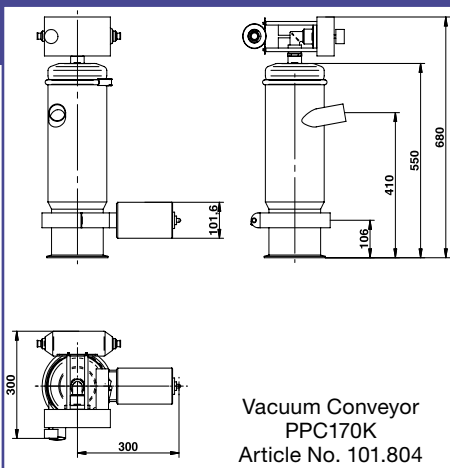


Fig. 1: PPC250 installation to transfer Paracetamol powder from a drum into a mixer.

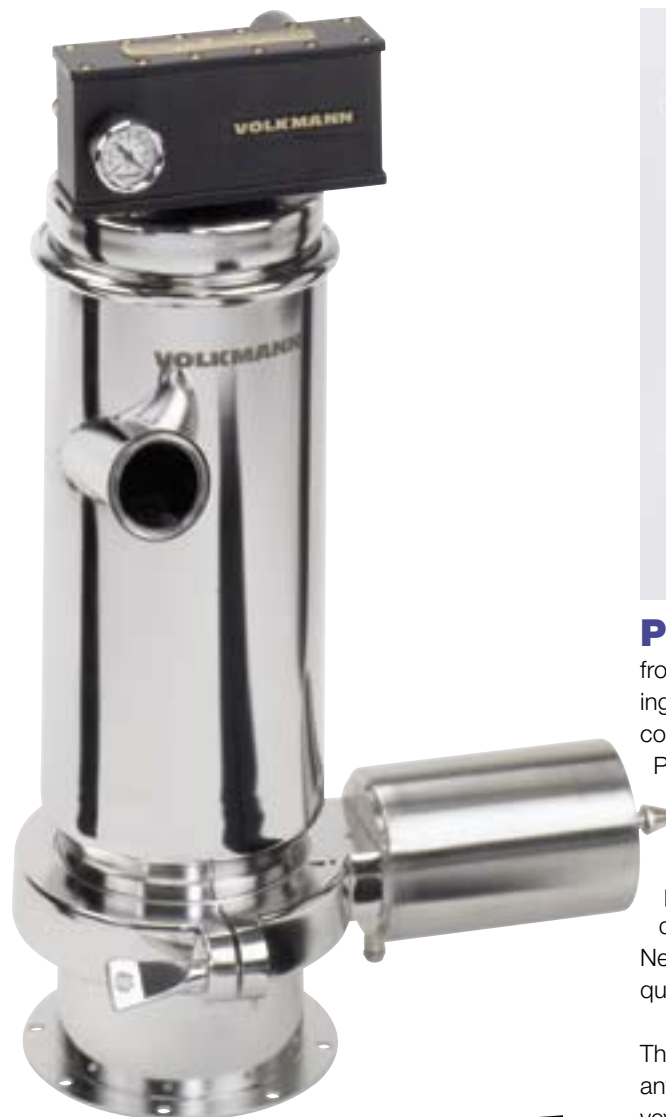
Fig. 2: PPC315 in sterile design, **complete with material certificates** of all parts with product contact. **Includes all Qualification documents.**

Fig. 3: Vacuum Conveyor PPC170K Vacuum pump mounted on its back, electrical control and suction lance.

Fig. 4: PPC Separator with special ETFE-coating, highly resistant to chemicals, FDA approved material.



A-D: Assembling / disassembling of the PPC's butterfly valve. No tools required!



Four standard sizes: Ø170, 250, 315, 450 mm

One-piece separator container:

AISI 316 L, electro-polished or mirror polished, $Ra < 0,8 \mu m$ ($< 0,5 \mu m$), free of gaps, all accessible

GMP design, lightweight, easy to handle, for perfect assembling/disassembling by hand without tools and optimum cleaning, particularly durable for long-life operation.

Absolute minimum of parts in contact with the conveyed product

Filter modules for quick change operation, long lasting and cleanable filters, sintered FDA-approved HD-PE material, stainless steel filters, PTFE coated cartridges, HEPA filters available.

Conveying capacities from 100 kg/h up to 6 t/h

Lightweight and easy to clean butterfly valves at the product discharge, all metal parts with product contact in AISI 316 L



PPC pneumatic pharma conveyors

from Volkmann were especially developed for all applications requiring top quality materials, surfaces and characteristics of all parts in contact with the conveyed materials. They are mainly used inside Pharmaceutical and Color/Lacquer industries because of their separator elements being built in a one-piece design; an optimum for such applications with frequent product changes requiring a quick reliable absolute cleaning of the Process machinery to prevent contamination of products. PPCs superior manufacturing quality and their gap-free design fulfils highest quality demands. Nevertheless, units are easily dismantled without tools, can be cleaned quickly and can be sterilized.

The design is completely electrical conductive, free of gaps, without any inaccessible spaces where the product might remain. PPC conveyors are fitted with a large butterfly valve at the discharge. This too can be easily dismantled without tools.

PPC Vacuum Conveyors are offered as pre-configured units regarding the individual application. They are available in the diameters 170, 250, 315 and 450 mm. Customers choose from a variety of Pharma or electrical conductive filter systems (e.g. for the feeding of products into Zone 0 of reactors). Special coatings or clamp modules are available upon your request.

All new PPC Conveyors are ATEX certified in accordance with directive 94/9/EG for the installation inside Zones 1, 2, 21 and 22. EC-type examination certificate No. TÜV 02 ATEX 7005X. For safe operation special terms/conditions apply. [Ex] II 1 D c 80°C / II 2 GD c 100°C (T4)



VOLKMANN PPCs are WIP/CIP-ready

We designed our PPC conveyors to meet CIP requirements (CIP = Clean in Place). Few accessories are needed to wash/clean and dry them in process.

We customize the conveyors on the standardized PPC platform technology and add all the individual accessories according to your special needs, as there are many different requirements on CIP and its grade of automation. Our Conveyors really fulfil the specifications you set and come with all necessary functions.



**Essential for hygienic material transfer:
VOLKMANN PPCs for GMP applications.**



When powders and bulk materials are conveyed or loaded inside explosive and hazardous areas, special aspects have to be considered to avoid electric discharges caused by the electrostatically charged product:

- What are the surrounding conditions at the loading and unloading point?
- Does the material itself have an explosion risk? Is it inflammable?
- Is the product static chargeable?
- What happens with the product during the transport and unloading?

Special measures can be necessary, if inflammable atmospheres and gases are present in addition to the conveyed material, if the minimum ignition energy (MIE) of the material is below a critical value (usually 1-3 mJ), if exothermal reactions take place or if clouds of dust are generated during the discharge cycles of the conveyor.

Volkman offers best practice solutions for such applications. All new Volkman Vacuum Conveyors of the VR and PPC series can be regarded "explosion-safe", if the MIE of the conveyed materials is bigger than 3 mJ (after risk assessment also for materials with MIE > 1 mJ) and if no inflammable gases are present.

VOLKMANN Vacuum Conveyors for Explosion Zones

- are free of ignition sources
- operate completely pneumatic without electricity
- are completely electrical conductive design
- have small interior filling volumes
- work with low transportation speeds
- produce no heat
- don't have hot surfaces
- don't have rotary parts
- are easy to control and to operate.

Additionally, Volkman offers special Vacuum Conveyors with inerting systems for solvents or if inflammable gas atmospheres occur and need to be considered. These Special Conveyors can even load powders and granulate materials into reactors with a solvent/alcohol atmosphere inside.

However, in such critical applications the conveyor is determined by local demands for the conveying task. The many advantages of Vacuum Conveyors are retained to make the work easier and safe, to the benefit of the work force and environment (no contamination or spill, easy and lightweight handling, perfect cleaning of all internal surfaces, GMP-conform design...).

Occasionally our Conveyor is required in a pressure-proof design, which we can supply. But already the existing standard makes it easy AND safe. This not only saves money but your production team will be happy to work with better and easy to use equipment.

Vacuum Conveyors with Inerting function: Volkman INEX.



Under certain conditions, inerting the conveying process can be necessary:

A) The material, which is conveyed, has a minimum ignition energy (MIE) < 3 mJ. Occasionally the inerting is only necessary with MIE < 1 mJ. Talk to us.

B) Inflammable gases or liquids are present during the transportation (e.g. suction out of zone 0 or 1; powder alcohol mixtures etc.). (Class 1)

C) The material shall be transferred into zone 0 or 1, that means into a zone, in which inflammable gases occur on a regular basis. (Class 1)

In the cases A and B the complete vacuum transportation process should be carried out under inert conditions, since critically high electrostatic charges can occur (caused by the friction between the conveyed product and the suction hose/tube). In the case C) the separator container of the Vacuum Conveyor is inerted in a special step of the conveying process.

Important! Customers wishing to work without inerting in the cases A-C require a comprehensive risk analysis (usually with instrumentation accompanied conveying tests). We offer special services.

All constructions of our current Vacuum Conveyors were revised especially regarding the needs of applications with explosive materials.

Fig. 1: Vacuum Conveyor in Pharma design, with inertizing done at the suction lance and complete inerting sequence done by a pneumatic control. Multijet vacuum pump inside the controller box.

Fig. 2-3: Mobile PPC Vacuum Conveyor with inerting function. For the feeding of powders and pellets into reactors inside a laboratory (multi purpose operation). Lightweight and flexible design for the safe loading of highly toxic materials.

Fig. 4: Feeding of a chemical mixer/reactor under atmospheric conditions. A pressure proof valve disconnects the Vacuum Conveyor during the positive pressure operation of the reactor. Additional safety valve (pressure control) mounted; pressure release valve possible. Pressure proof Vacuum Conveyors follow on the next page.

All new VOLKMANN Vacuum Conveyors INEX-VR, INEX-PPC and INEX-"pressure rated" are ATEX certified in accordance with directive 94/9/EG. EC-type examination certificate No. TÜV 03 ATEX 7017 X. For safe operation special terms/conditions apply.



II (1) G D (discharging) / II (1) D (2) G (inlet)
II 2 G D c Tx

Conform to ATEX regulations

Pressure resistant & shock-proof Vacuum Conveyors

For applications of vacuum conveying that require transfer directly into areas such as reactors required to withstand positive interior pressure, the separating container of the Conveyor is designed as a pressure vessel (permissible pressure range: -1 to +6 bar or -1 to +10 bar, versions according pressure-equipment-directive 97/23/EG available. Separator containers for the connection with standard flanges in diameter 150, 200, 250 and 300 mm available). Also the explosion prevention concept chosen by the customer and individual customer safety guidelines can make such pressure resistant and/or pressure-shock proof Vacuum Conveyor designs necessary.

Initially material is sucked into the separator while the pressure-proof discharge element is closed. Next, special pressure proof valves close the suction inlet and the line towards the Vacuum pump. The filter is cleaned by an air-shock, which can use inerting gas. By setting a delay between closing the inlet and shutting off the vacuum pump, the separators volume can be set under vacuum for a further reduction of the Oxygen content. By providing inert gas to the separator the pressure balances to its surrounding, thereby inerting the entire system. The evacuation of the separator chamber and inerting can be repeated in each cycle for 2-3 times assisting a further Oxygen reduction. This allows the pressure to balance between the Conveyor and the unit being fed. The Conveyors discharge valve opens and the transported material is transferred directly into the unit to be fed. An additional low-pressure back-blow system aids sticky material to discharge from the Vacuum conveyors separator container more easily.



Powder locks for Vacuum Conveyors

Powder locks are used for the feeding of bulk materials into vessels and to prevent direct contact between the vacuum conveyor and the vessel to be fed during the discharge cycle. They ensure that no aggressive or hazardous gases or dusts escape through the vacuum conveyor into the surroundings from the vessel to be filled.

VOLKMANN powder locks can be inerted easily to prevent gases (e.g. oxygen) from entering the vessel to be filled. Also the opposite direction of gas-flow (from the vessel towards the conveyor) can be eliminated by additional inerting after discharging the lock.

Our powder locks can be combined with VR and PPC conveyors as separate modular elements to build a compact and secure vacuum conveyor with parts from a single manufacturer.

If necessary, Volkmann powder locks are optionally available in 6 bar pressure proof and 10 bar pressure-shock proof design for the filling of reactors under positive pressures.



Vacuum Conveyor VR450 mounted on a mixer / reactor. With a powder lock (mounted diagonally, as the available space is limited).

Top: Vacuum Conveyor in pressure-resistant design for the feeding of pharmaceutical substances into reactors. With inerting function to feed materials into Zone 0. As the transported materials are harmful and toxic, a secondary filter unit is installed separate from the conveyor. Completely pneumatic control and compressed air (or N2) driven Multijector Vacuum pump.

Middle: Vacuum Conveyor in pressure-resistant design. With inerting function for the powder transfer of chemicals into pressure-proof mixers (Zone 0). Completely pneumatic control and compressed air (or N2) driven Multijector Vacuum pump. Valves at suction connection and discharge as specified by the customer.

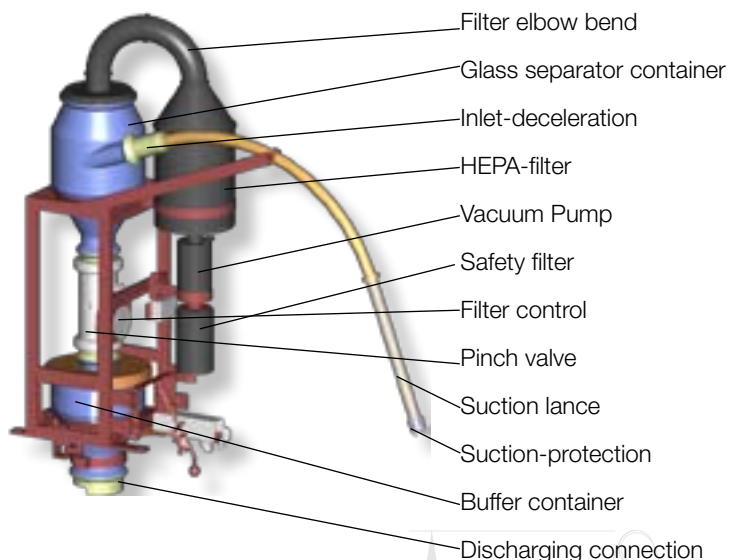
Right: Vacuum Conveyor with pressure-resistant powder lock, which disconnects the atmospheric part of the conveyor from the positive pressure section of the Reactor. With special inerting function.

Advantages of our Vacuum Conveyors for hazardous applications – Your Customer Benefit

- well established filter technology
- no product compression inside the conveyor
- easy and reliable discharging
- conveying capacities 100 to 4000 kg/h
- purely pneumatic operated systems with failsafe controls
- electrical vacuum pumps upon request
- customized Valves/fitting as specified

Tablet conveying - why compromise?

VOLKMANN Special Vacuum Conveyors for Tablets



System design (example)



Vacuum Conveyors with glass-made container system and HEPA filter to fulfil the highest quality demands on the conveyed products surface and consistent quality.

Especially for: Film tablets

Coated and uncoated tablets
Dragees
Capsules
Sensitive bulk materials



Tablets are one of the most difficult materials to be conveyed. Whenever they are to be transported, it is important to achieve the desired throughput but maintaining the quality of the conveyed material, while requiring careful attention to detail. Mechanical damage, chipping, scratches, wear, coloring (grey-shadowed surface) etc which have to be avoided.

Tablet Conveyors from Volkmann offer damage-free transport for many different and sensitive tablets. Tablets are either picked up from containers, or directly from the tablet presses, load containers and filling (or packaging) machines without generating dust. They are easy and flexible to install offering a reliable and safe automatic material supply, even with applications having limited headroom.

In Volkmann Tablet Conveyors all contact surfaces are wear-free and are made from glass. For the transportation pipeline special gap-free and shock-minimizing hose systems are used. The tablets enter the conveyor through a deceleration device and are collected in the separator container. The air flow is directed into a second filter vessel during the suction cycle such that possible dust from the tablets is separated and collected. After filling of the glass separator container the vacuum pump is switched off automatically. The tablets are discharged through a pinch valve, e.g. directly into a blister packaging machine or into an integrated glass buffer container. The glass design of the complete conveyor allows a literally "transparent" production process.

The application, the desired conveying capacity, but especially the tablets to be conveyed themselves as well as loading and discharging, determine the detail design of the Tablet Conveyor.

From Volkmann our clients not only receive tailor-made conveyors but also complete system solutions e.g. for conveying and weighing of their products.

Talk to us and use our experience in the chemical/pharmaceutical bulk materials handling.

Volkmann offers PPC- and Tablet-Conveyors with the additional service of onsite **Qualification. We support your Qualification team and provide all necessary Qualification documents.**

- User Requirement Specification
- Functional Specification
- Design Qualification (DQ)
- Factory Acceptance Test (FAT)
- Installation Qualification (IQ)
- Site Acceptance Test (SAT)
- Operation Qualification (OQ)
- Performance Qualification (PQ)
- Validation (by the user)

Additional assistance, e.g. for the final Cleaning Validation (Surfaces in contact with the product for SWAB-method ...) or assist in setting up SOPs is also available.

Conveying, weighing and dosing: VOLKMAN Conweigh®



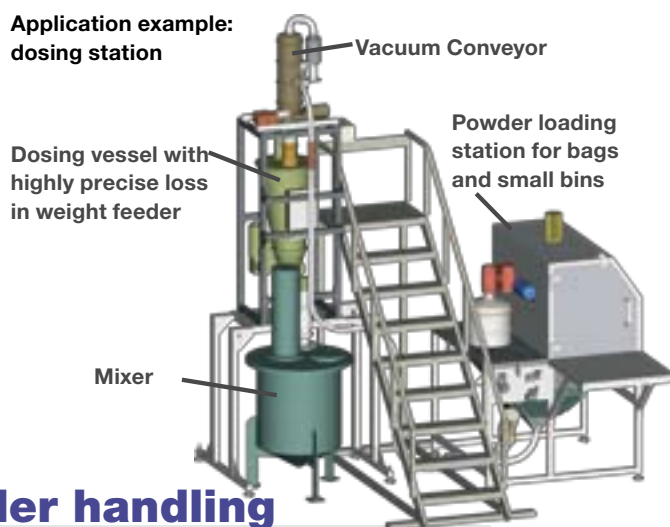
Volkmann Vacuum Conveyors with weighing and dosing function are built on the basis of VR and PPC conveyors, thereby providing a wide range possible applications. They work gravimetrically with the vacuum conveyor mounted on a special frame completely isolated from external forces and loads. The filling weight is constantly measured throughout the suction cycle. The special design and assembly provides the well known advantages of all VR and PPC Conveyors (easy accessibility and cleaning).



Volkmann Conweigh System for the feeding of a chemical reactor

Inquire about special systems, e.g. combinations with loss in weight feeders, prepared conveyors in weighing frames for on-site dosing controllers etc.

Application example: dosing station



Complete solutions for the powder handling

Improve your production conditions with a tailored powder handling system, engineered and built as a complete solution from one partner; Volkmann. Avoid unnecessary interfaces, intensive co-ordination work, multiple suppliers and safety risks with critical materials.

Our customized complete solutions give you a dust free handling from the emptying of all types of containers to the proportioned supply of materials into production processes.

The application picture and 3D-illustration show a dust-free loading station for bags and small bins together with a Vacuum Conveyor, which feeds a gravimetric dosing station with Aluminium oxides. The material is delivered at a high accuracy into a local mixer. Inside the feeding station, the material is fluidised with Nitrogen, improving its fluidity and lowering the risk of ignition during transportation. The feeding station has virtually no residual material remaining after the transfer process. Operation under completely inert conditions is possible upon request.

Options: A partly automated, self cleaning system, is achievable depending on the transported materials. With toxic and highly effective substances the product contacting surfaces can be wetted completely with water or wash emulsion and can be prepared for more intensive cleaning. All relevant construction units can be dismantled without tools fast and cleaned simply.

Use our know-how for:

- Feasibility studies
- planning and engineering
- Single Source Supply
- Installation and on site service



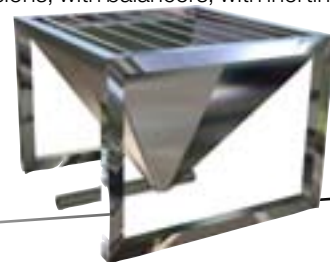
Let us engineer a tailored system for your transfer installation.



Suction Wands from Volkmann provide working flexibility and are easy and hygienic to use

VOLKMANN offers manual suction wands in various designs and materials:

- Hygienic suction wands, stainless steel 304 or 316L, Ø19, 25, 32, 40, 50, 75 and 100 mm.
- Suction wands with feeding element for secondary air (top picture) available in stainless steel 304 or 316L, Ø 32, 40, 50 and 75 mm.
- Double suction wands with feeding element for the discharging of drums and bags (middle pictures). Secondary air fluidizes the material at the entry of the inner pipe. The air flow is adjustable and enters through the gap between inner and outer pipe. Additional Conveying air can be supplied on a second adjustable inlet at the wands grip. Different designs available - consult with us. Available in stainless steel 304 or 316L, Ø 32, 40, 50 and 75 mm.
- Special suction wands are manufactured according your requirements, e.g. with all necessary material certificates, in special materials, with coatings, in customized dimensions, with balancers, with inerting connection at the wand ...



VOLKMANN Bin discharging systems



Automatic or manual systems for the discharging of barrels, drums, bags, bins and containers

Bag emptying systems

Containment systems

Discharge products such as powder, dust and granulated material directly from barrels, drums, bags, special bins and containers, even with plastic liners. Combine our units with process control systems and integrate remote controls or monitoring systems. All levels, alarms and error messages as well as other required information can be transmitted by an interface for evaluation and monitoring.

Ask us for our solutions on how to pick up and convey the materials within your production process, e.g. for emptying bags and special bins, Big-Bags, Silos etc. Utilize Volkmann's experience in powder handling.

Your Benefit

- Dust-free material handling
- Product aspiration and loading with full control
- Avoid the difficult manual handling of all sorts of bulk materials packed in drums/containers
- Reduce health risks in the workplace
- Protect the environment from hazardous materials
- Increase the quality of your final products and the working environment



Loading elements to convey materials directly from bins and local machinery



We supply standardized and individually designed aspiration elements with feeding elbows for the efficient pick-up and transfer of material for vacuum conveying. All elements are designed to fit within the available space for the particular application and environment. Additionally they provide the necessary additional conveying air, which makes poor flowing materials become fluid, within the package. Also available:

- product loading stations with inerting function, e.g. for products with a content of alcohol or solvents,
- product loading stations with sterile filters, which can be flanged directly to existing process machinery,
- product loading stations with submerging tube connections or with clamp elements for the flexible aspiration of products directly from bins/containers.



Filters for Vacuum Conveyors



Volkman Vacuum Conveyors come with the best choice of filters for the customer application. E.g (A) PE-HD filters, Ø40 x 60/200 mm, G 3/4" male thread, material UH-MWPE (HDPE), FDA-approved material, pore size < 5 µm, BIA approved acc. DIN EN 60335-2-69 app. AA class M, filter rate >99,99%, filtration area 0,025 m² per filter (at 200 mm filter length), max. operation temperature 80°C, max. cleaning temperature 120°C (without load, max. 30 min). (B) Antistatic PE-HD-AS filters, (C) stainless steel filters, (D) PTFE-coated electrical conductive polyester fabric filter cartridges (FDA material), Filterbags with PTFE membrane (not shown).

Your Benefit: Long lasting filters with high efficiency and reliability, which are easy accessible and cleanable.

Suction hoses

Suction hose PUR

Polyurethane suction hose
FDA approved material
vacuum proof, lightweight, flexible
transparent (yellow opaque)
spiral hose with wire for earthing
-40°C to +90°C



Suction hose PUR-EL

Polyurethane suction hose
vacuum proof, lightweight & flexible
electrical conductive (< 10⁴ Ohm)
black
spiral hose with wire for earthing
-40°C to +90°C

Suction hose PVC

FDA approved PVC material
vacuum proof, middle weight
transparent, very smooth inside
spiral hose with wire for earthing
-10°C to +60°C

Mounting elements for Vacuum Conveyors

As part of our delivery program, clients are offered various different standard mounting elements, which are precisely adapted to our Vacuum Conveyor families. These can be mounted from above on supporting hoists and offer all necessary connections for the attachment of our timers and piston vibrators.

We recommend to attach the mounting elements to the lowest module of the Vacuum Conveyor. This prevents module damage during disassembly and ensures maintenance work during product changes or cleaning is completed quickly and safely.



We manufacture individual mounting elements, wall attachments, mobile hoists and trolleys for Vacuum Conveyors. All other necessary connections are made as required. Fitting exactly, in the required materials, fast and at an acceptable price.

Controls for Vacuum conveyors



Pneutimer T3S (top): Pneumatic Timer-Control for the operation of all VR- and PPC Vacuum Conveyors. Stainless steel controller box. Suction and discharge times adjustable between 2-30 Seconds, pre-set and remaining seconds clearly displayed for each cycle. On-Off switch, Pump delay time adjustable inside the controller box (the pump starts at a pre-set delay after the discharge element of the Vacuum Conveyor has been closed)

Pneutimer T4S (same outer design as T3S): same function as T3S, but with an additional adjustable timer for an emptying cycle of the suction line (emptying valve for the suction line required).

Pneutimer T1 (middle): Function as T3S but without pump delay. Durable plastic controller box with stainless steel mounting plate.

Pneutimer T2C (bottom): Control for simple Vacuum Conveying systems with suction and discharge time adjustable with display (both 2-30 s) and connections for active discharge elements (discharge modules ZK..)

Complete pneumatic **inerting controls** with or without integrated Multijector vacuum pumps are available in various versions and safety standards.

We supply **PLC Controls** from simple and compact boxes through systems with operator panels and graphic displays, bar-code readers, and full integration services for new or existing centralized manufacturing systems.

From single stage Venturis ...

The basic advantages of compressed air driven vacuum pumps are well known: small size, low weight, simple design, little maintenance and wear resisting operation put them in first place when it comes to pick-and-place applications. The easy installation, control and free positioning make work easy with their quiet operation and neither heat nor oil mist emission.

But how do you increase efficiency of such a Venturi? How to keep the high vacuum and same energy need but give lots more of induced air (suction air)? Take a look at the picture of the MULTIJECTOR® to understand: A classical Venturi comes with a primary nozzle (injector), a secondary nozzle (diffuser) and a jet chamber (the gap between). The compressed air rushes through the primary nozzle, expands and accelerates, which causes a pressure drop. On its way towards the secondary nozzle it catches and mixes surrounding air and finally exits the Venturi through the secondary nozzle.

... to the MULTIJECTOR®

A MULTIJECTOR® comes with an advanced nozzle system, in which additional nozzles are placed in line with the primary and secondary nozzle. The suction air of each venturi stage mixed with the compressed air of the primary nozzle works as the gas jet for the following stage. For free and with no more air consumption. These additional Venturi stages don't reach the high vacuum of the first, but their larger jet chambers produce an even higher suction volume. Still the vacuum pump reaches the high vacuum of the first Venturi stage, because flap valves close automatically in order of pressure balance between their certain Venturi stage and the collective vacuum chamber.

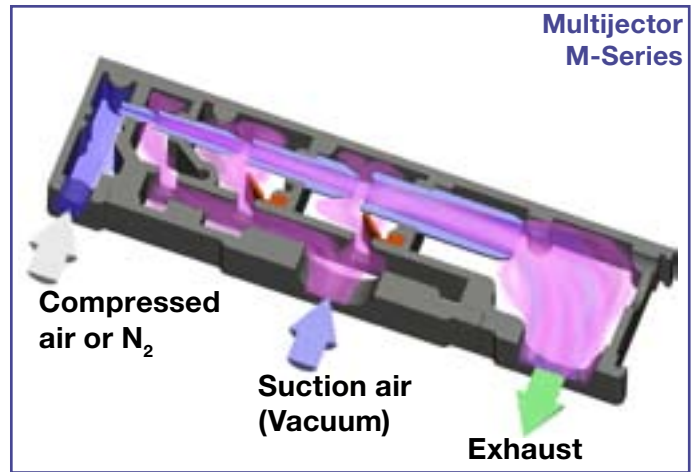
The special design of nozzles and aerodynamics gives Volkmann MULTIJECTOR vacuum pumps their unique efficiency: Common single stage Venturis perform at a ratio of 0.7:1 (suction air : needed compressed air). Modern Multijectors reach a ratio of up to 6:1. Take a MULTIJECTOR and save compressed air.

Energy consumption only in the suction cycle of the conveyor

In a vacuum conveyor the Multijector is turned on only during the suction cycle. While discharging the separator, the Multijector can easily be switched off. It requires no starting time for the next cycle like electrical pumps, also it has no wear during start and stop. The Multijector saves about 1/3 of compressed air during discharging, while electrical pumps need to run continuously and require additional vacuum valves to shut off the vacuum conveyor during discharging.

Electrical vacuum pumps

Occasionally customers ask for electrical pumps, but this is a rarity because of many cost saving advantages which our Multijectors offer especially for vacuum conveying. However, sometimes we suggest the use of an electrical vacuum pump with our conveyors – e.g. if the compressed air supply on site is insufficient or for very long conveying distances. Rest assured we will always do our best to find the optimum solution for your conveying application and consider your special demands and requirements.



The genuine vacuum pump for Vacuum Conveyors from VOLKMANN

Multijectors ...

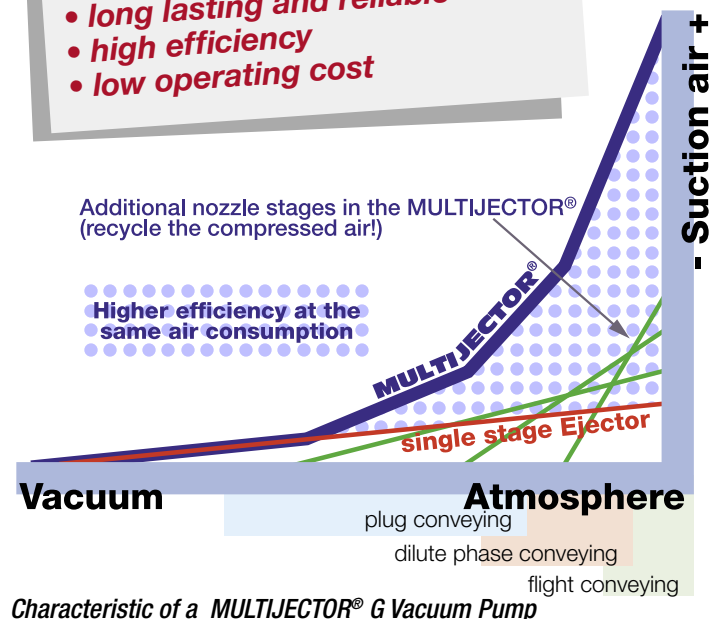
- ... are lightweight and quiet
- ... are maintenance free
- ... are free of wear
- ... don't have rotary parts
- ... don't need oil
- ... are purely pneumatic
- ... don't have ignition sources
- ... don't produce heat

and reach ...

- ... max. -0.91 bar vacuum (-27"Hg)
- ... max. 21 Nm³/min suction air (740 scfm)

Your Customer Benefit:

- easy to install and operate
- long lasting and reliable
- high efficiency
- low operating cost



Multijector M-Series



Multijector pumps of the M-series work with three ejector stages which are connected in a row. Their robust and compact aluminium casing make the pump resistant even to strong mechanical loads. Nevertheless they are very light and offer considerable amounts of suction air at a small size. M-Types are used with Volkmann Vacuum Conveyors having a diameter of 170 mm.

Multijector G-Series



General data
operating pressure:
4 to 6 bar flow pressure
(optimum 5.6 bar)

operating noise:
55 to 78 dB(A)

Operation temperature:
-20 to +80 °C

Materials:
Al, PE-HD, NBR



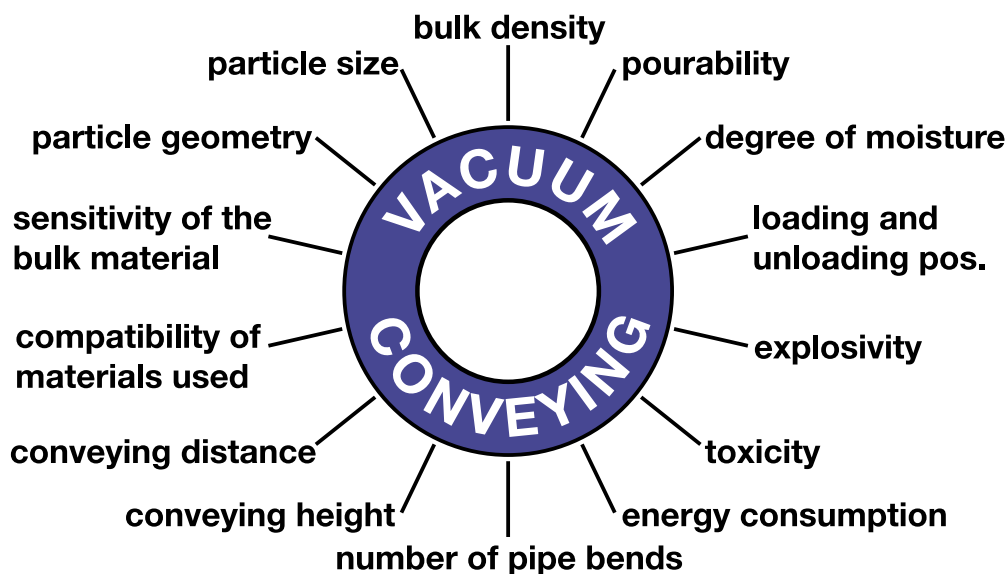
Multijector Type	Operat. pressure (bar)	Vacuum max. (kPa)	Compr. air cons. (NI/min)	Compr.air connect.	Pump width (mm)	Pump weight (kg)	Suction air flow (Norm.Liter/min) at the respective Vacuum level (kPa)								
							0	-10	-20	-30	-40	-50	-60	-70	-80
M270	6	-91	279	G 1/8"	88	1,0	1238	735	435	264	135	102	69	42	15
	5	-85	240				1140	615	375	189	138	99	48	18	12
	4	-63	201				1028	498	290	162	120	63	15		
M360	6	-91	372	G 1/8"	110	1,4	1568	931	580	352	180	136	92	56	20
	5	-85	320				1444	779	500	252	184	132	64	24	16
	4	-63	268				1302	631	386	216	160	84	20		
M450	6	-91	465	G 1/4"	133	1,7	1959	1164	725	440	225	170	115	70	25
	5	-85	400				1805	974	625	315	230	165	80	30	20
	4	-63	335				1627	789	483	270	200	105	25		
M540	6	-91	558	G 1/4"	156	1,9	2351	1397	870	528	270	204	138	84	30
	5	-85	480				2166	1169	750	378	276	198	96	36	24
	4	-63	402				1952	946	579	324	240	126	30		
G360	6	-91	372	G 1/2"	127	5,5	1980	950	593	361	180	136	92	54	23
	5	-85	320				1940	795	508	263	180	135	70	28	20
	4	-63	268				1750	620	365	226	161	94	24		
G540	6	-91	558	G 1/2"	127	5,6	2772	1425	890	542	270	204	138	81	35
	5	-85	480				2716	1193	762	395	270	203	105	42	30
	4	-63	402				2450	930	548	339	242	141	36		
G720	6	-91	744	G 1/2"	127	5,7	3350	1900	1185	721	359	272	184	107	46
	5	-85	640				3200	1590	1016	526	359	270	140	56	39
	4	-63	536				2850	1240	729	451	322	187	47		
G900	6	-91	930	G 3/4"	150	6,2	4188	2375	1481	901	449	340	230	134	57
	5	-85	800				4000	1988	1270	658	449	338	174	70	49
	4	-63	670				3563	1550	911	564	403	234	59		
G1260	6	-91	1302	G 3/4"	195	7,3	5863	3325	2074	1262	628	476	322	187	80
	5	-85	1120				5600	2783	1778	921	628	473	244	98	68
	4	-63	938				4988	2170	1276	789	564	327	83		
G1800	6	-91	1860	G 3/4"	262	9,0	8375	4750	2963	1803	898	680	460	268	114
	5	-85	1600				8000	3975	2540	1315	898	675	349	140	98
	4	-63	1340				7125	3100	1823	1128	805	468	118		
G2700	6	-91	2790	G 1"	375	11,7	12563	7125	4444	2704	1346	1020	690	401	171
	5	-85	2400				12000	5963	3810	1973	1346	1013	523	209	146
	4	-63	2010				10688	4650	2734	1691	1208	701	177		
G3600	6	-91	3720	G 1"	487	14,4	16750	9500	5925	3605	1795	1360	920	535	228
	5	-85	3200				16000	7950	5080	2630	1795	1350	698	279	195
	4	-63	2680				14250	6200	3645	2255	1610	935	236		
G4500	6	-91	4650	G 1"	600	17,3	20938	11875	7406	4506	2244	1700	1150	669	284
	5	-85	4000				20000	9938	6350	3288	2244	1688	872	349	244
	4	-63	3350				17813	7750	4556	2819	2013	1169	295		

(1 bar = 100 kPa = 1000 mbar = 750 mmHg = 29,53 inHg = 14,5 psi)

All technical data subject to change without notice.

How to select the suitable Vacuum Conveyor

Influences on Vacuum Conveying



Your transportation problem is our challenge. Working together on your project.

First the parameters conveying distance and conveying height are determined as well as the desired conveying capacity. Some characteristics of the material help us to make a first estimate of the correct size of unit.

Then the required type of product loading and unloading are set. Is manual suction with suction wands desired e.g. from barrels or bags? Or is it necessary to do the material feeding automatically, e.g. from silos, Big Bags or process machinery? How about the control system necessary? And how is the Conveyor to be connected to the unit to be loaded with the material? Mounted above without connection, flexible connection pipe or permanently fixed to it?

Further characteristics of the material as well as the surrounding conditions determine the exact design of a Vacuum Conveying system: How good is the pourability of the conveyed product? Is the material extremely fine? Does it have to be loosened up and/or fluidized to prevent bridging, in order to flow and be conveyable? Is the product sensitive to humidity/moisture? Can it block in the transportation line? Is there a risk, that material properties change by transport, e.g. the grain size is reduced by grinding effects between the particles and the transportation system? Is there the risk of segregation of the material? Does the surface of the product have to be protected by special measures, in order to avoid scratches and other impairments on the product itself?

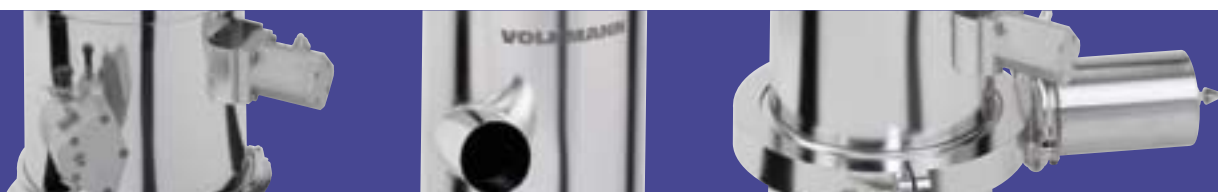
Aspects of health protection, explosion prevention and environmental protection play a further important role, in order to be able to offer safe working Vacuum Conveying equipment.

Is the material harmful or toxic? How may one come in contact with the product? Can it cause allergic reactions? Which filter quality is necessary? Are there risks for the environment? Can the exhaust air of the Conveyor go back directly into the room or is a central exhaust air system necessary and present? Is the material explosive, can it be ignited? Are ignitable gases present or can these be emitted from the product itself? Which conditions are present at the product loading point and the unloading position? What is inside the unit to be fed? Are explosion zones defined?

The reverse case can be found regularly e.g. in pharmaceutical production: there the product is protected against the environment. Which materials may come in contact with the product conveyed? Are special material certificates necessary e.g. for a qualification/validation of the production process? We supply according to your requirements.

Within your project we will work together and evaluate all these questions – we don't want you to buy a Vacuum Conveyor just based on catalog data. We want you to work satisfied with a really safe and reliable Vacuum Conveying system which helps you to produce efficiently and profitably and that you eliminate unnecessary risks inside your production works. We always take care to offer you the maximum benefit in using our Vacuum Conveying technology.

Come and speak with us about your application – contact VOLKMANN.



1. Customer Information

Contact person: _____
 Company: _____
 Department: _____
 Address: _____
 Country/post code/place: _____

Please make a copy, fill in the information available and FAX it to +49 (0) 2921 9604 900

Tel.: _____
 Fax: _____
 eMail: _____

2. Conveying task

Conveying height (↑): _____ m overall conveying distance (↑→): _____ m No. of pipe-bends: ____ x ____ °

Desired transporting capacity: _____ kg/h

Design of product charging location: _____
 (e.g. suction from hoppers, casks, sacks, silos, Big-Bags, plant equipment (dryers, mixers etc.), emptying of sheet metal)

Design of product discharging location: _____
 (e.g. loading of stirring vessels, mixers, filling machines, screening machines, tablet presses, weighing vessels, collecting containers etc.)

IMPORTANT: Please give more precise statements about pressures, temperatures, ascending steams, solvents etc. if necessary.

Will the unit be used in EX-area?

☐ NO ☐ YES: Suction from zone _____, installation place inside zone _____, charging into zone _____

Is the material ignitable? ☐ NO ☐ YES: Minimum ignition energy (MIE) of the products _____ mJ

3. Material definition of the product to be conveyed

Trade name: _____ Chemical designation: _____ Manufacturer: _____

Particle size (please state in µm or mm) from _____ up to _____

Bulk density: _____ kg/dm³ Density (basic material): _____ kg/dm³

Max. humidity content: _____ %

Particle description: _____ Particle geometry: _____

Flowing characteristics (estimation): ☐ good flowing ☐ sticky ☐ bridging

Is the material hygroscopic, does it absorb humidity? ☐ NO ☐ YES

Is the material scouring/wearing? ☐ NO ☐ YES

Is the material sensitive to mechanical loads? ☐ NO ☐ YES

4. Material requirements of the Conveying System

Which of these materials are NOT allowed to be used for product contacting parts of the Conveying System?

- ☐ Stainless steel 1.4301/AISI 304 ☐ Stainl. steel 1.4435 / AISI 316 L ☐ Stainl. st. 1.4571/AISI 316Ti
☐ Aluminium ☐ nickel-plated brass ☐ HDPE (PE-HD)
☐ Nitrile / NBR ☐ Silicone ☐ PUR (Polyurethane)
☐ Others: _____

Which materials are NOT allowed to be used outside the product contacting area?: _____

Do you have special wishes which materials should be used for the product contacting area of the Conveyor?

☐ Separator container: _____ ☐ Gaskets: _____ ☐ Others: _____

Are any special certificates necessary for the product contacting parts? ☐ NO ☐ YES: _____

Operative area of the unit (eventually tendency): ☐ Chemical ☐ Pharma ☐ Food ☐ Others: _____

5. Information with regard to health risks, industrial safety and environmental protection

Is the material poisonous/toxic? ☐ NO ☐ YES Is the material corrosive/caustic? ☐ NO ☐ YES

Does skin contact have to be avoided? ☐ NO ☐ YES Is the material inflammable? ☐ NO ☐ YES

Does the material cause allergic reactions? ☐ NO ☐ YES Is the material explosive? ☐ NO ☐ YES

Is the material harmful/ecologically harmful? ☐ NO ☐ YES Is the mat. hazardous for water? ☐ NO ☐ YES

NOTE: If you send sample material for testing, we need to get it packed in a reusable packaging and together with a safety data sheet. All samples, containers etc. will be sent back to the sender after the trials.

The freight charges will be billed to the customer.

Date, SIGNATURE _____

PLEASE ENCLOSE SAFETY
DATA SHEET IF APPLICABLE

**Material specification for Vacuum Conveying Trials
and for Quotations.**



Volkman stands for engineering and bespoke fitted products. We design solutions in close cooperation with our customers worldwide. Talk to us and take advantage of our solution based on many years of experience in the chemical, pharmaceutical and food industries.

Germany VOLKMANN GmbH

Schloifweg 17
59494 Soest (Germany)
Tel. +49 (0) 2921 96040
Fax +49 (0) 2921 9604900
eMail: mail@volkmann.info

Great Britain VOLKMANN UK Limited

Unit 50, Cressex Enterprise Centre
Lincoln Road
High Wycombe
Bucks, HP12 3RL (Great Britain)
Tel/Fax: +44 (0) 1494 512228
eMail: mail.uk@volkmann.info

USA VOLKMANN, Inc.

3855 Sylon Blvd.
Hainesport Business Complex
Hainesport, NJ 08036 (USA)
Tel. 609 - 265 - 0101
Fax 609 - 265 - 0110
eMail: usa@volkmann.info

France VOLKMANN France sarl

Creapole 1
32, chemin de Tournenfil
91540 MENNECY (France)
Tél. +33 (0)164 572698
Fax +33 (0)164 572038
email: france@volkmann.info

Conveying tests and on-site demonstrations

Volkman and our partners would like to demonstrate more of the world of vacuum conveying. We have test facilities available in Soest, Germany, and in most of our international partner companies, where clients can see our conveyors in action. Furthermore, we encourage "hands on" experience on all equipment. Conveying tests and further ongoing evaluations can be undertaken as a special additional service either onsite or in our labs. A complete test summary and quotation are provided for the suitable system. Ask for our 'Test Pack' documents to start the process toward better and safer material handling.

Seminars and Customer training

Would you like to know more about vacuum conveying and special applications? Contact us and ask for industrial seminars, training and company workshops tailored to your needs. We give you and your team the basic tools that you can see the areas in your plant where and how vacuum conveyors could increase production quality and safety: increase your production profit and save money by using Vacuum Conveyors from VOLKMANN.

VOLKMANN

... powder-handling unlimited ...

