



Dense Phase Pressure Pneumatic Conveying



Pneumatic Conveying

Dense Phase Pressure



Dense Phase Pressure

Convey rate: 2 to 100 tons/h.

VERY ABRASIVE MATERIALS CONVEYING

This dense phase pressure conveyor system is suitable for **very abrasive materials**, at all throughput rates and all temperatures.

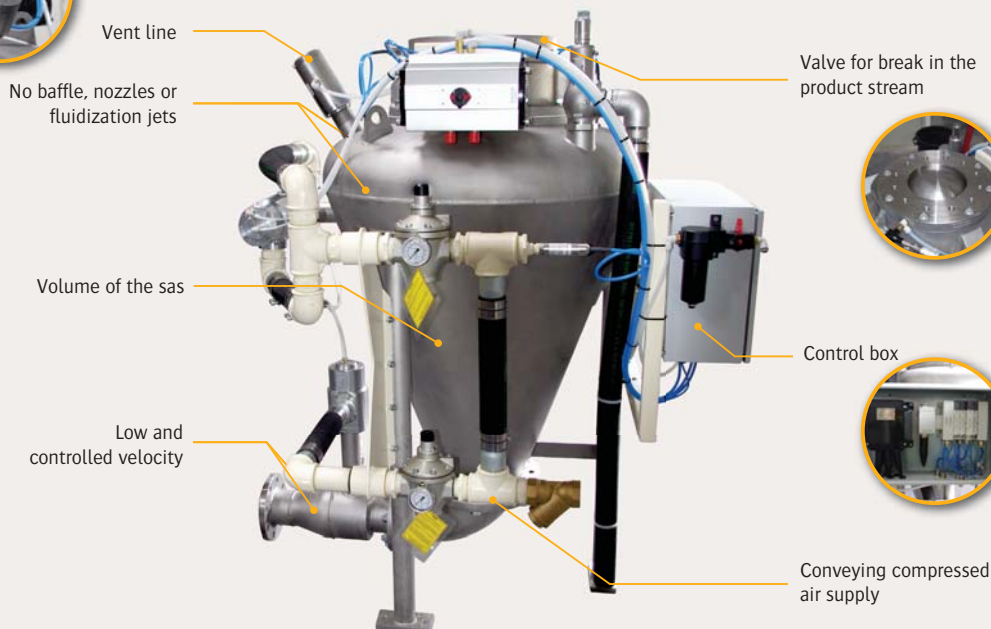
In this type of pneumatic conveyor, the valve cuts the product flow above the transfer tank. This tank is fitted with a double case and a special output elbow that allows to send the product slowly to the pneumatic conveyor piping. This completely patented dense phase conveying system allows to ensure the elbows for up to two years against abrasion, and to provide a guarantee of 1,000,000 operating valve cycles before general revision. Furthermore, the dispatching valve can be cooled by water circulation, which allows to send materials at very high temperature in the process.

TECHNICAL SPECIFICATIONS

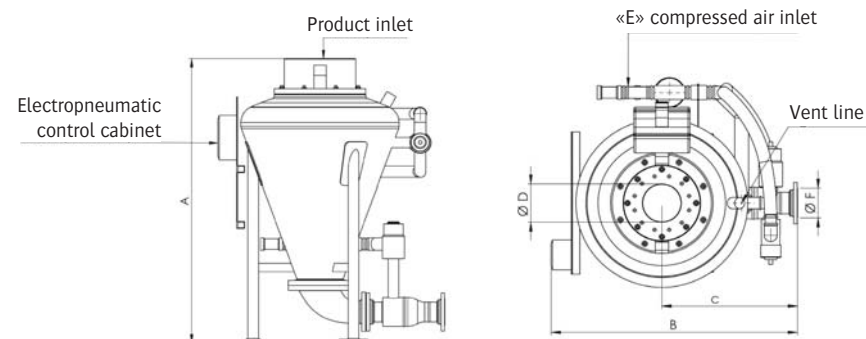
- Particules size:** very fine (ash) to big (peanuts)
- Overpressure average level:** 4 bars
- Manufacturing:** cast iron, 304L and 316L stainless steel
- Compressed air consumption:** 2 to 114 Nm³/min.
- Maximum conveying distance:** 700 m.
- ATEX Certification:** zone II 1,2,3 GD (EMI less to 3 mJ)
- Maximum temperature:** 280°C
- Maximum operating temperature:** > 300°C
- Inlet Ø:** 50 to 600 mm.

ADVANTAGES

- . For granules, powders and mixtures
- . Slow and smooth conveying, with less compressed air and energy consumption
- . A simple system and not contaminating
- . Less wear due to low conveying rate
- . Without mixtures damages
- . Stainless steel construction for sanitation or corrosion resistance



GENERAL DRAWING



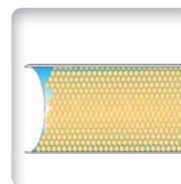
Advantages



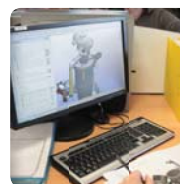
➤ Limited abrasion and segregation



➤ Long conveying distances



➤ Very high convey rates



➤ Optimized design to meet specific needs

DIMENSIONS (MM)	MODELS										
	114/4-4	114/8-4	228/8-5	342/8-6	342/12-6	570/12-8	857/12-10	1428/12-12	2125/16-12	2825/16-12	3500/16-12
SAS volumes (litres)	114	114	228	342	342	570	857	1 428	2 125	2 825	3 500
A	1269	1279	1503	1725	1807	2026	2276	2956	3680	4230	4759
B	1190	1190	1252	1285	1131	1127	1153	1607	1607	1848	2247
C	543	543	535	533	521	435	375	781	781	898	1092
D	200	200	200	200	300	300	300	300	400	400	400
E	50	50	50	63	63	76	76	76	101	127	153
F	102	102	127	152	152	103	254	30	254	305	305
Weight (KG)	335	455	525	555	753	1157	1501	2019	2450	3130	3850

PROCESS



PRINCIPLE OF OPERATION

1. During the filling of the tank, both valves in the supply pipe are open
2. The product fills the tank through gravity system until detection of the top level
3. The upper valve is closed to stop the flow of material before the closure of the second valve and the pressurization of the tank
4. The material is discharged through the outlet pipe at the top or at the bottom depending on the layout of pneumatic conveying circuit
5. Fluidizing devices may be included in the tank bottom in order to facilitate the evacuation. The distribution of the gas between the top and bottom of the tank is controlled by orifices in the outside area.

PNEUMATIC CONVEYING RANGE - DENSE PHASE PRESSURE



OPERATING MODE



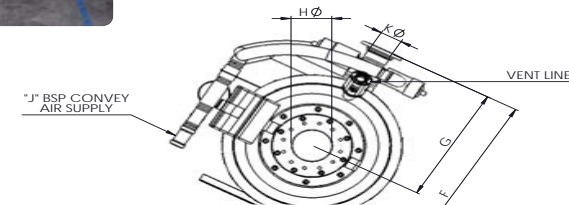
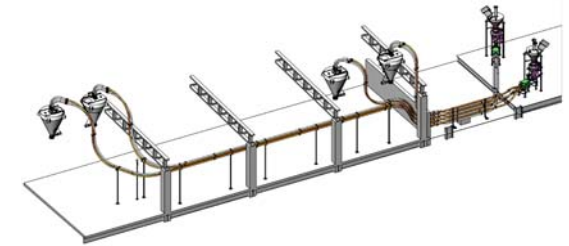
1. Introduction of the material in the sas

2. Closure of the valve in the product = reduced air consumption

3. Controlled introduction of air

CASE STUDY

Realization of an assembly of pneumatic conveying to feed sack filling machines:
 - 2 feeding silos
 - 4 packaging lines



EXAMPLES OF INSTALLATIONS



Loading tank cars



Long convey distances



Dedicated high rate line

INFLATEK® VALVE

The Inflatek® valve was specially developed for pneumatic transfer tanks.

Its advantages:

- . No abrasion
- . Tight and sealed closing thanks to an inflatable seal
- . Tight and sealed closing thanks to a static or moving product column
- . Pressure: 43 bar
- . Temperature: 280°C
- . Size: 50 - 600 mm

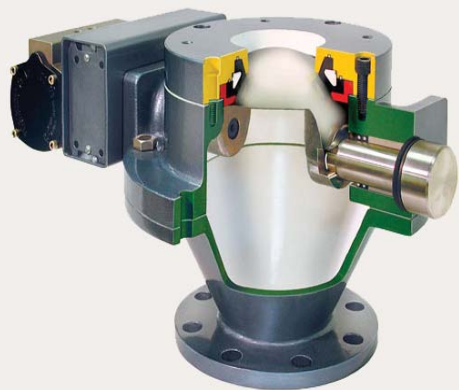


The Inflatek® valve is unique in its ability to close and to ensure sealing in a single action, through a column of static or mobile material. This feature ensures complete filling of the tank. Air consumption is strongly minimized.

Sealing is provided by the inflation of elastomeric sealing gasket which prevents wear from erosion of the seat and of the seal of the valve.

The Inflatek® valve has a nominal capacity of one million cycles between each inspection, which almost eliminates the maintenance operation and costly production downtime.

TECHNICAL FEATURES



➤ **Abrasive materials:** abrasive slurries, powders, bulk granules and gases loaded with dust cause erosion of the seat and the inefficient closure of classic valves. The inflatable seal and its function of automatic compensation overcomes the problems related to wear because of abrasive materials.

➤ **Differential pressure:** this pressure usually causes the rapid wear of the seat due to non-caught particles and transportation at high speed. The inflatable seal allows to effectively catch particles to prevent their movement and thus the premature wear of the machines.

➤ **Closing and sealing:** the movement of the dome enables complete closure in the bulk material column and the action of the inflating seal allows a perfect sealing.

Additional information

The inflatable seal is available in different polymer versions according to the material ranges from abrasive dusts to food products.

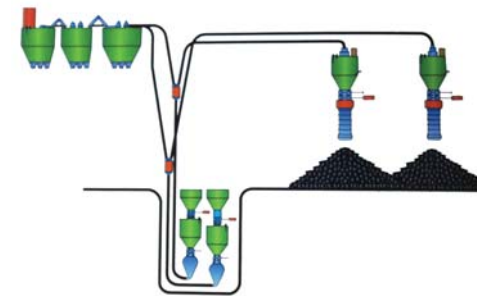
If the material flows into the vacuum or remains static within a column, the valve is designed to stop the transfer and provide a complete sealing.

U.S. DEPARTMENT OF ENERGY

Objectives :

- . Minimum particle size degradation
- . Low operation cost

Retrofit of a poorly designed pneumatic conveying system for run-of-mine coal fuel size 50 mm. Low velocity, dense phase coal handling for rotary grate coal fired boilers and dust-free yard storage. The coal transfer system has been developed to maintain a low velocity of the coal fuel. In addition to minimizing material degradation, the low velocity ensures very little or no pipe wear.



Basic data:

- Coal fuel
- 2 X low velocity conveying systems (50 mm)
- 5 reception point
- Ambient temperature
- 40 t./h.

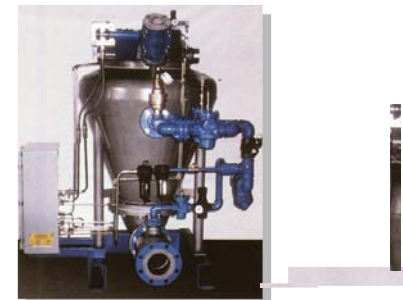
ALLEN SUGAR

Objectives:

- . Minimum particle size degradation
- . Low operating cost

Allen Sugar required the most modern handling system for fragile granular sugar and dextrose without any change to the product grain size or shape. Exacting degradation limits were established for pre-contact engineering.

The system satisfied all objectives with negligible degradation of the sugar granule or the dextrose material.



Basic data:

- Sugar, dextrose
- 3 low velocity conveying systems
- 2 to 5 reception points
- Ambient temperature
- 12-30 t./h.

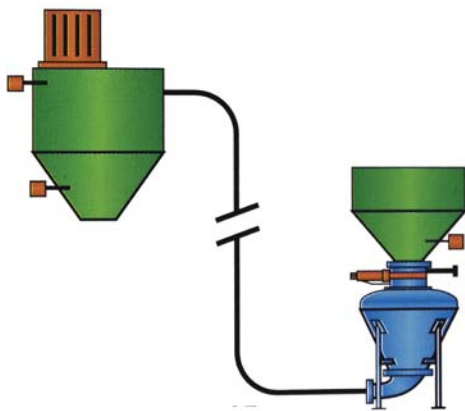
Examples of installations

➤ BRUNNER MOND

Objectives:

- . Minimum particle size degradation
- . Operating reliability

Customer manufactures sodium bicarbonate which is used for a wide range of individual and consumer products. The quality of the product depends upon the consistency of the particule size distribution with a severe limit on fines content. To satisfy these requirements, low material velocity is required, which was achieved by the pneumatic conveying system.



Basic data:

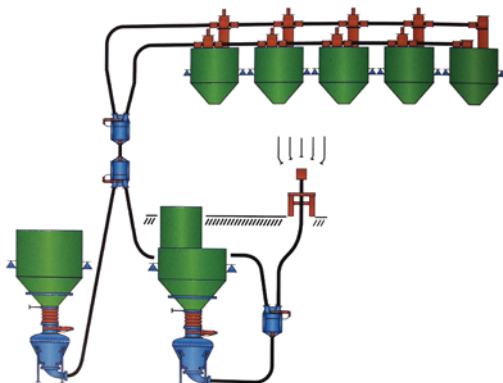
- Sodium bicarbonate
- 1 low velocity conveying system
- 1 reception point
- Ambient temperature
- 22 t./h.

➤ ACE HARDWARE

Objectives:

- . Operating reliability
- . Accurate weighment
- . Low operating cost

A loss-in-weight batch weighment control is provided at each transfer unit. Any of six different materials are introduced to the system for pre-weigh and transfer to any of six receiving bins. TiO₂ is an unusual material which exhibits cohesive characteristics from its grain shape even when dry and apparently free flowing.



Basic data:

- Titanium dioxide (TiO₂) and other materials
- 2 X low velocity conveying systems (150 mm)
- 6 reception points
- Ambient temperature
- 25 t./h.