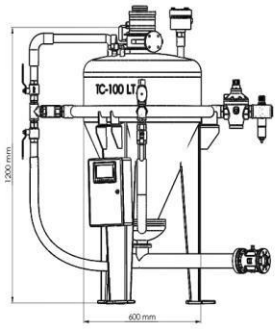
TEKNOCONVEY

PNÖMATİK TAŞIMA VE PNÖMATİK TRANSPORT SİSTEMLERİ



DENSE PHASE
PNEUMATIC TRANSPORT UNIT

TeknoConvey **pneumatic transport** dense phase conveying pot use to load and highpressure air to convey. During the loading cycle, feeding buterfly valves open to allow material to flow by gravity into the tank from one or more sources, such as hopper and storage silos. When the tank is full, the feding inlet butterfly valves switch off to stop the flow of material inside to pot. Many point injection then pressurizes the tank to the discharge set point and the discharge valve opens, **transporting** the material to enter the convey line pipes to feed feding point. When the pot or tank is empty, the conveying air is shut off and the pressure which remaining in the tank clears the remaining slug of material from the convey pipes.

Avarage Spesifications Pneumatic Transport Unit

Model	Effective standard tank capacity	Conveying air capacity	Standard capacity
		m^3/min	Ton/hr
TC100	100 lt	0.14～0.46	0.6 / Ton

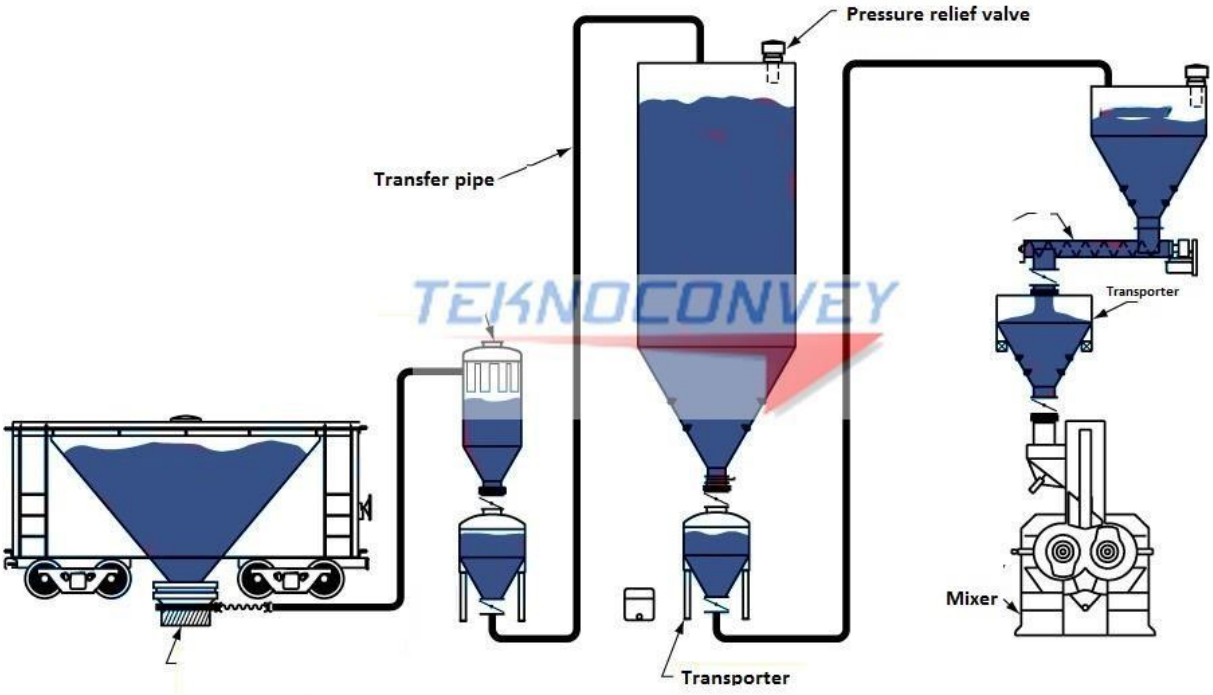
About TC100 Pneumatic Transport Unit

Pneumatic transporter dense phase uses high pressure air to convey at extremely low line velocities (120 m/min) and the highest material to air ratio (135-140).

For control TeknoConvey using programmable logic controls (PLC) allow the easy control and supervision of the operation.

TeknoConvey can produce specify carbon, stainless steel or epoxy coated.

TeknoConvey all dense phase **pneumatic transport** tank suitable to mount has multiple inlets and load cells also customer can use as weighing hopper our pressure tank.



Applications:

Powder loading and unloading, in-plant transfer, transfering of batchs. The best material-to-air ratios and lowest convey line velocities for the biggest rate with slighty handling

Below are given a sample dense phase **pneumatic transport calculations** for sand (calculation of pneumatic dense phase transports) All values can be changed according to your products spesification, capacities and your sizes… For your products values please contact with TeknoConvey engineers.

TECHNICAL SPESIFICATION	
Pipe dimentions	50mm
Pot volume	100 lt
Max convey rate	650 kg
Total vertical piping	25 mt
Total horizontal piping	20 mt
Number of 90 degree elbows	4 pcs
Product coefficient of friction	0,4 mue
Pipe materials (al / ss / cs)	Cs
Air temp	80 C
Desired air velocity at pick-up	3 m/s
Ambient press	1 Bar
Minimum conveying gas flow	21 m3 / Hour
Total airflow required	23 m3 / Hour
Average HP at convey pr.	0,1
Materials bulk density	1300 kg/ m3
Particle diameter	1mm
Feed pipe diameter	100mm
Materials flow factor (slow-fast)	Fast
Valve switching time	45s
Batch weight	128 Kg
Allowable cycles/hr, aver.	5
Allowable sec/cycle, (total)	771 s
Time to convey	667s

Dense Phase "**Pneumatic Transport**" System High Pressure - Low Velocity

TeknoConvey dense phase **pneumatic tranport** systems are the best when conveying products highly abrasive products Dense phase **pneumatic transporting** uses high pressure air combined with so low velocity to convey product and can be supplied for various conveying capacities up to 200 tonnes per hour over distances up to 500 metre.

TeknoConvey high qualities pressure vessels designed to long time using the high pressure differential requirement rather than an rotary feeder as used on dilute phase **pneumatic transport** systems. There is some limited number of moving parts give the dense phase conveying a big advantages over a rotating device and any mechanical trasport sytem such us bucket elevator or belt conveyor.

TeknoConvey" ***Pneumatic Transport*** " Pressure Vessels has specific characteristics:

Suitable for abrasive and friable all type products

Dense phase conveying combined with big-bag discharge unit

Capacities up to 200 tonnes per hour

High pressure low conveying velocities

Conveying velocity 2 - 8 m / sec

Conveying pressure up to 5 bar

Batch conveying

Minimal product damage the any meachanical transport systems

More longer conveying distances

Notes of our experiences;

Dense phase conveying system design

Design of dense phase **pneumatic transport** system

The pressure drop in a dense phase **pneumatic transport** system is highly dependent on a number of physical properties of the bulk material itself. The properties of the material influence the frictional losses within the convey line. Of course, the surface roughness of the convey line plays a role in this. With most materials, smoother pipes will reduce the friction coefficient and reduce pressure. There can be exceptions to this rule, but will be with some powder applications only. Once a specific material is conveyed and the friction coefficient is calculated, the friction coefficient will remain constant . Our engineers can give very accurate results for predicting pressure drops and airflow requirements for a dense phase system, especially when the product friction coefficient has been determined first.

The friction coefficient value can be slightly different for the same material. One noted observation is that when the horizontal line length is very short (<15 mtr) or the vertical distance is more than the horizontal distance, the value of the coefficient often will be some what higher and is at the upper end of the range specified for a particular material. This phenomenon can be explained by the sensitivity of the energy balance equation with these parameters. It typically is not a problem because the system is normally designed for some longer pipe run. The pressure drop

associated with a short pipe run (for example, a blending operation) is normally not critical to the entire system design.

Material temperature may have a significant influence on the product friction coefficient. Many plastics fall into this category. It is important to know what the softening temperature of the material is in order to predict, or select a coefficient from our engineers.

Pneumatic Transporting Pipe sizes: Our engineers will allow you to select up to pipe sizes ranging from 2 inch to 14 inch in diameter. Alsıo we will select a single convey line size and the desired internal pipe diameter, the desired material convey rate, the piping distances, and the quantity of 90 degree elbows. Notes: Two 45 degree elbows are equal to one 90 degree elbow.

Pneumatic Transport Convey rate is the desired instantaneous product transfer rate. If a pressure pot vessel will be used in the system design, then it may be necessary to perform the "pressure pot sizing calculation" prior to performing this calculation with our engineers

Velocity leave the pick-up air at 120 mtr/min unless you are familiar with the minimum pick-up velocity of the material. This is a good starting point for most pelletted materials.

Ambient pressure is important for obtaining the correct airflows. The airflows are converted to standard conditions so there is no confusion later as to the correct requirement for the mass flow of air.

If the terminal velocity is more than 450 mtr /min, you must consider with our engineers the next larger line size.

If the pressure drop is greater or equal to your proposed supply pressure, increase the pipe size.

Pneumatic Transport **Convey line stepping**

There are a number of reasons for stepping the convey line piping. Typically, there will be no advantage in doing so unless the total line length is more than about 15 mtr. Here are the main reasons for stepping the convey line:

The product is extremely fragile and line velocities must be kept to a minimum.

One line size is too small, but the next size seems too large.

Terminal velocities exceed 450 mtr /minute.

Energy consumption is critical to the system design.

Choose right pressure pot or vessel sizing

The pressure pot sizing calculated by our engineer to give the customer a "working volume" for the pressure vessel in order to achieve an average product convey rate. All pressure pot designed **pneumatic transport** systems have some dead time. Dead time is referred to as the time necessary for valve switching, and pressurizing, depressurizing, and filling of the vessel. During these times, there is no transfer of material. In order for the "average" transfer rate to be realized, a greater "instantaneous" feding rate must be produced. It is typical for the system designer to design the convey line for an instantaneous feeding rate at 1.5 times the average rate. The physical dimensions of the vessel can vary due to installation restrictions, product type, etc.

A calculation is made which approximates the flow of products through a hopper with a specific discharge flange opening diameter. The necessary product input parameters for the calculation are: bulk density, particle diameter, angle of repose, opening diameter, and material flow factor. Entering the above values will provide a solution for estimating the fill rate (in kg/hr) and the time (in seconds) necessary to fill the vessel to the working volume. NOTE: The vessel volume can be minimized by keeping the fill pipe as large as possible.

For the best theory and design of dense phase *pneumatic transport* systems please contact with TeknoConvey.

Our Aplications for *pneumatic transport* dense phase systems;

PLASTIC PELLETS, HDPE, LDPE, LLDPE, NO SLIP, LLDPE, WITH LOW SLIP, LLDPE, WITH HIGH SLIP, ULDPE, HMWPE, UHMHPE, PP-HOMO POLY, PP-CO POLY, PET, ABS, , PA, NYLON, PVC, PIGMENTS, ORGANIC, PIGMENTS, INORGANIC, OXIDE, METALLIC, TITANIUM, OXIDE, METALLIC, IRON, OXIDE METALLIC, ZINC, OXIDE, METALLIC, LEAD, OXIDE, METALLIC, CHROMIUM, OXIDE, METALLIC, NICKEL, CENTRIFUGE CAKE, FLUOROCARBONS, SLUDGES POWDER, SOY BEAN MEAL, COTTON SEED, HIGH-FAT BAKERY ,CALCIUM CARBONATE, DISPERSION RESIN, WOOD CHIPS, SAWDUST, PLASTIC REGRIND, ASBESTOS FIBERS, FIBERGLASS STRANDS, CHOPPED PAPER, CHIPS, STEEL, BRASS, ALUM, BAGASSE (AGRI RESIDUE), PTFE, PC, COATED PRILLS, SILICA SAND, DRY SALT, PELLETIZED MATERIALS, IONEXCHANGE RESIN, LIMESTONE, FLUORSPAR, PULVERIZED MINERIAL

ORE, SODA ASH, FINE SILICA SAND, GROUND COKE, MEDIUM-GRADE SUGAR, POTASH, HYDRATED LIME, CEMENT, SILICA GEL, STARCH, CLAY, POLYMER POWDERS ,CARBON BLACK, PEARLITE, BAKING FLOUR, BARYTES, COKE FINES, SUGAR, POWDERED, FLY ASH, ALUMINA, CALCINED COKE, CALCINED LIME, PHOSPHATE, LEAD OXIDE