

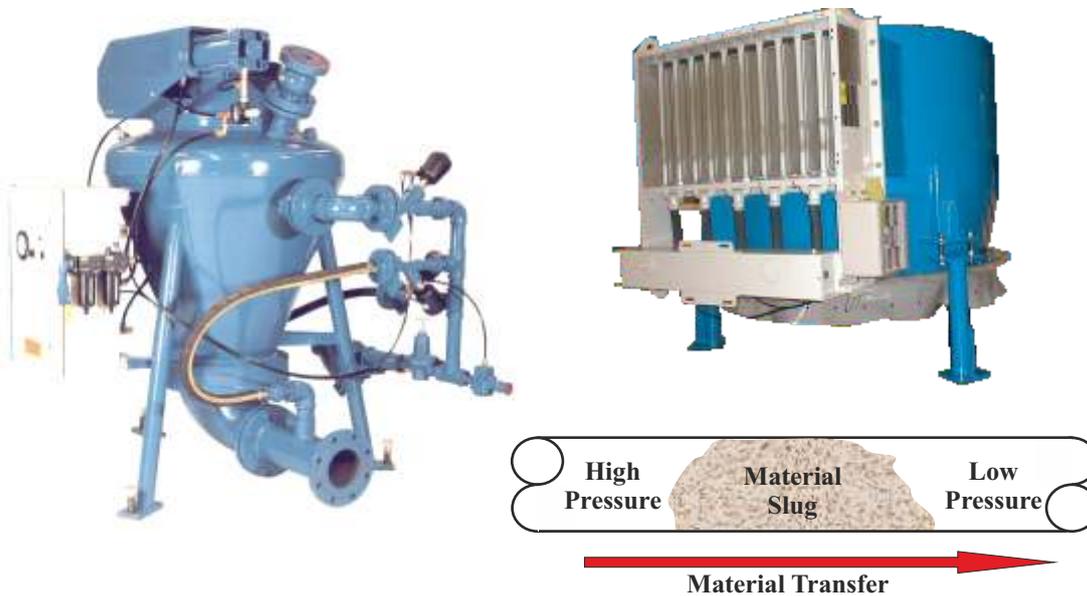
Pneumatic Conveying Systems

Dense Phase Pneumatic Conveying

Dense phase pneumatic conveying systems transfer product as a slug of material at slow speed under high pressure. Dense phase systems normally operate as a batch transfer system where a batch of materials is weighed and discharged into a pressure vessel. The vessel is then pressurised and the discharge valve opened therefore forcing the material along the conveying pipe line. This type of conveying system causes less damage to delicate materials which are susceptible to degradation when transferred at higher speeds.

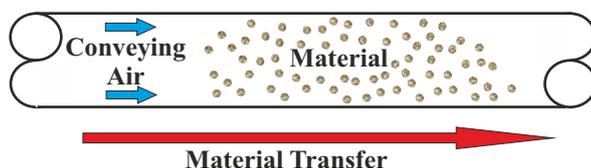


Material is transferred to the receiving vessel which is fitted with a reverse jet filtration system which separated the transferring air from the material via a series of filter cartridges. The cartridge are automatically cleaned between batches using reverse air jets.



Lean Phase Pneumatic Conveying

Lean phase pneumatic conveying systems transfer product as a stream of material travelling at high speed but under low pressure. This type of transfer system can be utilised for both batch and continuous production and uses a blower unit to force conveying air along a pipe line into which the material is introduced. Material is generally fed from a discharge station or a weigher into the conveying line via a rotary valve which not only delivers material at a constant rate but also separates the upstream equipment from the conveying pressure.



Vacuum Conveying

Vacuum conveying systems operate in reverse to a lean phase system where material is transferred from source to destination via a vacuum pump or inverse blower. Air is sucked out of the transfer pipe line which causes a vacuum and therefore pulls the material along. This type of transfer system can also be utilised for both batch and continuous production systems.

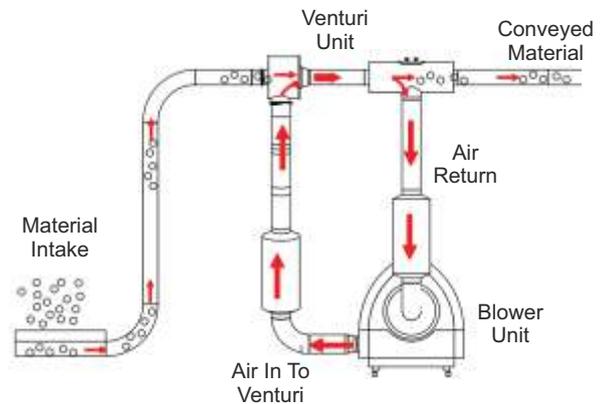


Vacuum transfer systems generally utilise rotary valves or similar feeding system to control the flow of material into the line and normally incorporate a filter or cyclone unit on the receiving vessel to separate transferring air from material.



Venturi Systems

Venturi systems use the principles of fluid dynamics to create both negative and positive conveying pressures. A negative pressure is created upstream of the unit and a positive pressure is created downstream. Such systems are therefore very effective in sucking material from its source and supplying it to the destination under pressure. These systems convey materials using lean phase technology and utilise either a cyclone or filter unit at the destination to separate conveying air from conveyed product.



The venturi system works by creating a constriction within the pipe (classically a hourglass shape) that varies the flow characteristics of the gas travelling through the tube. As the velocity in the throat is increased a consequential loss in pressure occurs. This drop in pressure therefore creates a vacuum effect which can be used to draw material into the conveying pipeline. On the downstream side of the venturi unit the material is conveyed using the positive pressure air flow.

C J Waterhouse company are a UK distributor for Kongskilde, a leading supplier of venturi systems around the world. Their extensive experience within material conveying using fluid dynamic principles has led them to provide a unique system which vastly reduces air consumption and reduced end of line filtration requirements due to their air return system. This system removes a portion of the air that is supplied to the venturi to create the vacuum and returns it back to the blower unit to be recycled.