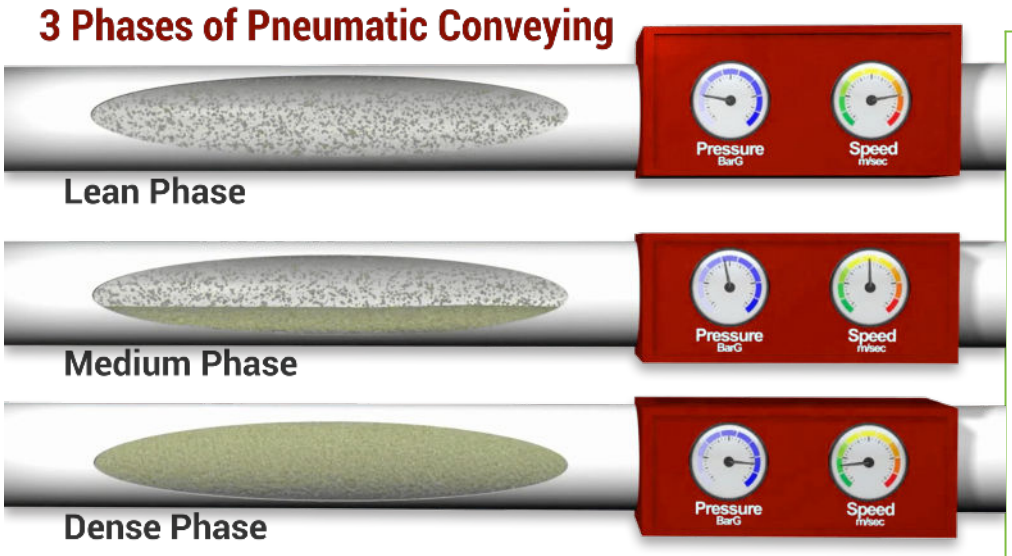
Pneumatic/Vaccum Conveyors vs Cable Conveyors

Types of Pneumatic Conveying:

Dilute Phase: In the dilute phase, high-velocity low-pressure air carries the product along suspended in the air stream. The space inside the tube contains mostly air, and there is only a small amount of product moving along with it in a steady stream. This does not require high-pressure because it is not using air to push the product, the product is being carried within the air. These systems are well-suited to conveying small amounts of product per unit air compared to dense phase systems.

Dense Phase: Using high-pressure air behind the product to push it along, a thick slug of material moves through the tube. It moves much more slowly, and the majority of the product is only in contact with more product.



Vaccum: Vacuum conveying systems are similar to the dilute phase. The primary difference is where the blower exists. On a dilute phase conveyor, the blower is forcing air into the pipe away from the blower, creating a positive pressure difference at the start of the conveyor. A vacuum conveyor creates a negative pressure at the end of the conveyor, causing a stream of high-velocity air moving toward the blower. These systems are well-suited to conveying small amounts of product compared to dense phase systems. Vacuum systems, because they use negative pressure, are less likely to leak, but if there is a leak, contaminants can be pulled into the system.

Cleanability

The pneumatic conveying systems are somewhat cleanable because of the high velocity of the products moving through the system but they do not have the ability to wipe down the inside of the pipe like a Cablevey does.

A Cablevey system has the ability to be cleaned in place (CIP), which is a simple design for cleaning. It is difficult, if not impossible, to use a CIP system in pneumatic conveyors because there are rotary airlocks that have to be taken apart, dust collectors, filters at the other end of the system, and the bags that have to be removed and washed.

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Energy

Depending upon the type of pneumatic conveyor (dilute or dense phase), the air has to be moving at a very high velocity or very high pressure. This requires up to 19 times as much power as tubular drag conveyor.

The volume of air required to move product and the tendency of the product to be in the air-stream (actually by design in the dilute type) requires larger dust collection systems to separate the product from the conveyance air at the destination point. This requires yet more power.

This chart below compares our most commonly used motor, 5.4 HP... compared to other common means of conveying – like chain conveyors – using 2.5x more energy, to the use of pneumatic conveyors often using 10x more power.

Energy Efficient

Electric Motor Operating Costs (Cablevey uses 1 to 7.5 HP Drive Units)

Horsepower/ Kilowatts1	Full Load AMP	NEMA Efficiency	Annual Cost*
1	1.6	85.50%	$419
5.4	7.2	89.50%	$2,160
7.5	9.5	91.70%	$2,928
12	16	91.70%	$4,684
25	31.7	91.70%	$9,758
50	63.4	91.70%	$19,517

Products:

Products of a large particle size or high bulk density do not convey well in dilute phase systems, as the particles do not remain suspended in the air stream well. In a dense phase system, the high-pressure air may blow through the spaces between the particles leaving the product unmoved. More speed or more pressure would be required, meaning more power.

Sticky or wet products have a tendency to build up in the pipes.
Combustible dusts in a pneumatic system will become airborne by design. This poses a risk of explosion if an ignition source is present.