

Defining Pneumatic Conveying System Regimes

Defining Low Velocity, Dense Phase and Dilute Phase Pneumatic Conveying Systems

Many people do not agree on the definition of the dense phase and dilute phase mode of pneumatic conveying. Some people define the conveying mode or regime based on the material to air ratio with dense phase having a mass loading of 15-100 to 1. The current definition of whether a system is dense phase or dilute phase is based on whether the superficial air velocity in the system is above or below the saltation point of the material. Systems with velocities below the saltation point are designed and calculated as a dense phase system.

To further complicate the definition of the various conveying modes, low velocity conveying systems are offered. A low velocity conveying system is a dense phase system with the superficial air velocity substantially below the saltation point.

Figure No. 1 shows examples of four pneumatics-conveying regimes with an illustration of the flow of the air/solids mixture in a horizontal pipe. If you have any questions, please feel free to contact us at 570-546-3165 or by e-mail at mktinfo@younginds.com.

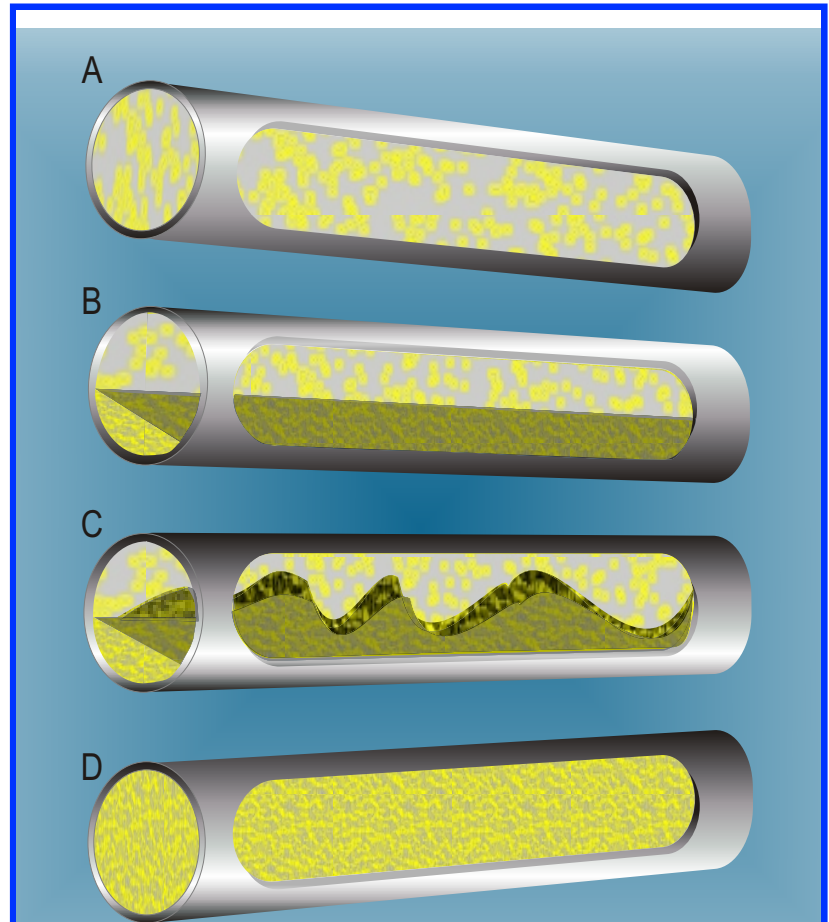


Figure No. 1
Examples of four pneumatic conveying regimes

A "TransVair" dilute phase conveying regime: velocity above the saltation velocity 3800 to 8000 ft./min velocity unsuitable for abrasive and fragile materials- for long distances up to 700 ft.

B "Multi-Phase" true dense phase conveying regime: highest velocity below the saltation velocity 1400 to 4500 ft./min. velocity suitable for powder and narrow particle size distribution may not be optimum design for fragile or abrasive materials- for long and very long distances up to 8000 ft.

C "Multi-Phase" low velocity discontinuous or plug flow dense phase conveying regime: Low material velocity 700 to 2300 ft./min velocity Material moves in dune-like fashion good for fragile or abrasive materials short or long distances up to 1200 ft.

D "Multi-Phase" low velocity solid dense phase conveying regime: very low material velocity 200 to 1400 ft./min velocity - pipeline almost full of material - excellent for fragile or abrasive materials for short distances up to 300 ft.