



The dense phase conveying system operates on the principle of high pressure, low velocity and a high solids-to-air ratio: material advances through the pipeline as a plug or dune flow at a velocity far lower than dilute phase, resulting in minimal pipe wear and little material degradation — ideal for abrasive, friable materials and for long-distance, high-tonnage applications. Conveying rates reach above 100 t/h, conveying distances can extend several kilometres, and air supply pressure can exceed 8 bar.

Operating Cycle: The inlet valve opens and material enters the pressure vessel by gravity, while the vent valve equalizes vessel pressure to ensure smooth filling. Once full, the inlet and vent valves close and seal, and compressed air fluidizes the material at the vessel base while pressure builds. When the set pressure is reached the discharge valve opens and material is conveyed as a dense-phase plug along the pipeline to the target silo, where air-material separation is completed by the dust collector on the receiving silo. After conveying, purge air clears residual material and the valves reset for the next cycle — all under automatic PLC control.

Key Features

- ◆ Low-velocity dense-phase conveying — minimal pipe wear, little material degradation, no segregation
- ◆ High solids-to-air ratio, low air consumption, reduced load on terminal dust collection, economical energy use
- ◆ Pressure vessel designed to pressure-vessel codes; single-vessel intermittent or twin-vessel continuous conveying options
- ◆ Top-discharge / bottom-discharge / mid-discharge conveying pump options to suit different materials and discharge methods
- ◆ Abrasive materials can be handled with wear-resistant ceramic composite pipes and pipe-assisted air injection to prevent blockage and wear
- ◆ Suits powders with high bulk density, particle size ≤ 5 mm, moisture $\leq 3\%$ and instantaneous temperature ≤ 200 °C, with single-point or multi-point discharge

Typical System Composition



Key Specifications

Conveying capacity: up to 100 t/h and above; conveying velocity: low speed 1–10 m/s; conveying distance: long distance (equivalent distance ≤ 1000 m, vertical rise ≤ 60 m); air source: screw / Roots / piston compressor, pressure up to 8 bar and above.

◆ Selection notes: please provide material name, bulk density, particle size, abrasiveness and flowability, conveying volume, conveying distance and lifting height, and the number of receiving points. Our engineers will determine the vessel volume and air supply configuration.