

Semi-dense phase pneumatic conveyors

Safe and efficient transport of abrasive or friable materials



Our semi-dense phase pneumatic conveyors are the ideal solution for medium-speed conveying of abrasive or friable materials, such as cement or ash.

Semi-dense phase pneumatic conveying, as the name suggests, has characteristics that fall between dilute and dense phase. During conveying, the air velocity, which is between that used in dilute phase and dense phase systems, allows only the lightest particles of the product to be suspended, as in dilute phase conveying, while heavier particles are transported in "blocks." The system is configured like dense phase conveyors, but uses pressure vessels with fluidized bottoms. This allows it to handle semi-abrasive powders and powders that require prior aeration before being discharged into the conveying line.

Operating principle of semi-dense phase pneumatic conveying

Semi-dense pneumatic conveying moves materials at speeds of less than 10 meters /second, and the vacuum generated within the system is particularly high, approximately 800 mbar.

These performances allow for the transport of materials, both suspended and compacted, and in blocks in contact with the pipeline.



Characteristics and performance in semi-dense phase

- Solids concentrations greater than 20% by volume
- High air speeds (<20 m/s)
- Pressure losses per unit length (< 20 mbar/m)
- Volatile particles are and carried by the air while heavier suspended viscous particles are carried in blocks.
- System limited to medium range
- Ideal for continuous transport of solids and viscous materials
- Suitable for flow rates of approximately 20 tonnes/h



Semi-dense phase transport types



Semi-dense phase transport in suction
The semi-dense phase suction conveying mode allows for the extraction and conveying of **medium-fine powders** with a dual effect: the lighter particles move quickly through the pipeline, while the heavier ones compact and are transported in "packets."
This way, the product is handled gently, preventing it from being crushed.

Semi-dense phase transport under pressure

The semi-dense pressurized phase conveying method is used with **powders that have a low specific weight** and are not mixtures.
At the beginning of the system, the blower motor introduces a large amount of air into the pipeline where the material to be conveyed or "pushed" toward one or more destination points is introduced.



Main sectors of use of semi-dense phase conveyors

Builder, Food, Cosmetic & Chemical

Food industry

One partner, an entire ecosystem of solutions

The food industry is a key sector for FR Sistemi. From the very beginning, we have collaborated with food companies to develop and provide pneumatic conveying and industrial suction solutions specifically tailored to meet the needs of this sector.

The products and technologies we provide to small and large food production companies meet every stage of the food industry's production process:

- transportation of raw materials,
- mixing
- weighing
- suction and recovery of waste in the packaging phase

The range of FR Sistemi solutions for the food industry

Our range of industrial vacuum cleaners and conveyors is among the widest and most diverse on the global market, thanks to our extensive experience working with food manufacturing companies to design increasingly efficient and precise solutions that are increasingly focused on energy savings and environmental protection.

Today, in addition to the purely structural and mechanical aspects, we equip our products with the latest digital and connected technologies to allow you to monitor machine operation at every stage of the process, even remotely.

Pasta, confectionery, coffee, tea, legumes, powdered milk, and even hundreds of spices or types of rice: we process each product with technologies that preserve its nature and composition as we move it to processing machines. We are even more careful to ensure that these products do not release dust into the environment, protecting every operator.