

BULK

I N T E R N A T I O N A L

Powder handling solutions



...for conveying, discharging, weighing, filling or blending.

Whatever your requirements, Spiroflow can design a system to meet your precise needs.

- ✦ Experienced application engineers
- ✦ Full test facilities
- ✦ Advanced design and manufacturing
- ✦ A wealth of experience with poor flowing products
- ✦ Dedicated after-sales service and technical back-up

With over 25 years of experience and thousands of successful installations worldwide, you can be confident that Spiroflow can supply the right equipment for your needs.

KEEPING YOUR PRODUCTS IN FULL FLOW

SPIROFLOW

POWDER HANDLING SYSTEMS

Spiroflow Ltd., Lincoln Way, Clitheroe, Lancashire BB7 10G

tel 01200 422525 • fax 01200 429165

web: www.spiroflow.com • email: info@spiroflow.com



FLEXIBLE
SCREW
CONVEYING



AERO MECHANICAL
CONVEYING



VACUUM
CONVEYING



FILLING
BULK BAGS



FILLING SACKS

HANDLING

CONVEYING SUPPLEMENT

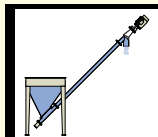
Choosing the

Andrew Dean of **Spiroflow** explains the selection criteria for flexible screw, aero-mechanical, and vacuum and pneumatic conveying techniques.

Spiroflow now offers three solutions for the conveying of powder and granular materials. None can be considered the best in the absolute sense as each type of conveyor fits a particular role.

Selecting the ideal conveyor can become a daunting task for the buyer who may not be aware of the advantages of the individual types.

A product feasibility test is always advisable to determine the most suitable conveyor for the material concerned, the distance involved and the throughput required. However, the following guidelines can be used as a starting point.



Flexible Screw Conveyor

The simplest and low-cost solution is the flexible screw type, comprising a stainless steel spiral rotating within an UHMWPE food-grade tube. This type of conveyor suits materials with a bulk density up to 2.5kg/l and can carry material to a maximum distance of 20m, although multiple units can extend to greater distances as required. Maximum throughput rate is 20,000kg/hr.

The term flexible means that the tube and the spiral within it can be curved to some extent. This creates installation flexibility to convey around any obstacles between the inlet and outlet.

The spiral itself has a round cross section in most applications, but a flat version can be used for cohesive or fine materials.

It is desirable to have a generous head of material in the feed hopper, as this assists the elevation of material when starting.



ABOVE: Flexible screw conveyors at Farley Health Products.

Flexible screw conveyors in action

Flexible screw conveyors are used at Farley Health Products in Cumbria.

The plant is maintained at full pharmaceutical levels demanding very stringent operating standards. An Intermediate Bulk Container (IBC) containing blended product is placed above a sealed hopper designed by Spiroflow. Once in place, the valve of the IBC is opened allowing the product to flow into the hopper without any risk of atmospheric contamination or escape of dust.

The conveyor then carries the product at a very steep angle to a packing system. The system fulfils the very highest levels of hygiene and dust containment, despite strict operating parameters.

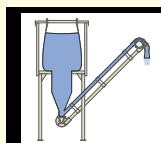
Also, the conveyor is designed to run full of material; empty running will lead to excessive noise and wear. The main advantage of the flexible screw type is its simplicity. This results in short installation times and low maintenance. USDA 3A-accepted designs for pharmaceutical use are

available, and the whole system can be stripped down for cleaning in minutes.

Wear is a problem only with abrasive products, and life with other materials is almost indefinite. Tubes and spirals can be easily replaced.



right conveyor



Aero-mechanical Conveyor

The aero-mechanical conveyor has the alternative and more descriptive name of a rope and disc conveyor. The continuous rope is looped and travels through a tube with a series of equally spaced discs secured to it.

This type of conveyor is applicable to vertical conveying up to 20-25m. A major advantage is that degradation to the material is almost negligible with this type of conveyor. This is because it creates a moving current of air in which the material is borne, similar to the effect of a vacuum or pneumatic system. However, the aero-mechanical conveyor does not need a cyclone or filter to separate the product from the air.

Furthermore, the air carrying the material is not expelled at the outlet. The material is separated from the air that carries it, and the unloaded air current is directed down the return section of the tube. It is therefore retained in the tube circuit.

Typical maximum rates of throughput are: oats, 40 tonnes/hr; milk powder (26% fat), 20 tonnes/hr; and granulated sugar, 80 tonnes/hr. If installed vertically, the throughput of the aero-mechanical is unaffected, and material can be lifted at the above-stated rates of throughput to 20 or 25m.

Throughput of the flexible screw conveyor, on the other hand, will diminish the steeper the angle at which it operates. The extent of this depends on the nature of the material. The problem is caused by fall-back of material back through the center of the spiral, which can be checked by the provision of a central core or tube. Single flexible screw conveyors of 6 to 8m in length can then be used in the vertical.

An aero-mechanical conveyor should always be started empty and stream fed. In some cases a controlled feed device such as a screw or flexible screw conveyor will have to be used.

Maintenance needs are moderate to high. The rope must be tensioned occasionally. Rope life depends on conveyor length, the number of starts and stops, solids loading, and whether routine inspection and tensioning are properly performed.

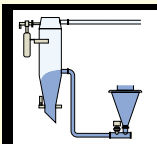


ABOVE: Bulk bag discharge system incorporating an aero-mechanical conveyor for the handling of titanium oxide.

Aero-mechanical conveyors in action

Spiroflow has developed a new bulk bag discharge system which incorporates an aero-mechanical conveyor for the handling of titanium dioxide and other poor flowing, cohesive products.

The system comprises a bag support dish with tensioned side arms to retain the bag in a taut position, insuring total emptying of bag contents. A number of dust control features are included in the system. Product from the bulk bag discharger feeds into the aero-mechanical conveyor via a rigid screw which serves to regulate flow.



Vacuum Conveyor

A pneumatic conveyor uses air to convey materials through an enclosed pipeline. It provides a solution for any user requiring a system that is easy to route, has few moving parts, is dust-tight in operation and completely empties the system of product with minimum residue. Most systems are derivatives of three basic technologies employing some common equipment in terms of filtration, pipeline fittings, blowers or compressors.

Vacuum conveying is made under negative pressure, but its use is usually restricted to throughputs of around 10 tonnes/hr over 50m. The motive air force is provided by either a roots pump or side-

channel high-efficiency fan sited at the receiving end of the system. Air powered venturi systems are also used for low-capacity conveying, however despite their comparative low capital cost they can prove more expensive to run.

Vacuum systems are regularly used to transfer material from sack dump units, open containers, drums, silos and big bag dischargers where longer transfer distances and excellent route flexibility is required.

Variants of all the above types of conveyor can be produced in mobile forms for processors who require transfer of materials at several locations.

Spiroflow Ltd.,
Lincoln Way, Clitheroe,
Lancashire BB7 1QG
Tel: 01200 422525
Fax: 01200 429165
email: info@spiroflow.com
website: www.spiroflow.com

Spiroflow Systems, Inc.,
2806 Gray Fox Road,
Monroe, NC 28110, USA
Tel: (704) 291-9595
Fax: (704) 291-9594
email: info@spiroflowsystems.com
website: www.spiroflowsystems.com



Bulk storage and packing line feed system installed at a major tea and coffee processor.

Vacuum conveyors in action

Wherever materials need to be transferred, vacuum conveying offers distinct advantages in terms of good product flow rates and low maintenance costs.

The main advantage for this type of conveyor is the fact that the product will only come into contact with air throughout the conveying line. Coupled with their dust-free operation and easy-to-clean features, this makes them particularly suitable for transferring food and pharmaceutical materials where the most rigid standards in hygiene and containment need to be met and maintained.

The product range for these materials is virtually unlimited and is used for salt, sugar, flour, starch, spices, yeast granules, glucose, talc and paracetamol. Other major users include the chemical, plastics, water and minerals industries.