

How it WORKS

Vacuum Conveying for Soiled Bedding Removal

Problem: The cage wash is often located in excess of 500 feet from the loading dock. Manual, soiled bedding removal to a standard shared compactor requires significant material handling and exposure of building occupants to allergens and odors.

Solution: The VBRS 9400 poly phase vacuum conveying system from SMC-Roe with a continuous flow thru separating valve overcomes the distance limitations of conventional vacuum bedding removal systems and permits deposition of the spent materials into any conventional compactor.

Once adjusted to site conditions, poly phase vacuum conveying overcome issues that plague conventional systems arising from the highly variable properties of the spent caging materials presented at any given time.

Whereas conventional dilute phase vacuum conveying systems are dependent upon conveying air velocity to provide lift of individual particles to be conveyed, poly dense phase systems rely more on vacuum pressure than on conveying air velocity to move materials.

Dilute phase vacuum conveying systems employ relatively large 3" - 6" (75mm to 150mm) diameter conveying lines or tubes to allow free flow of air and are typically limited to 150' to 300' (50m to 100m) before the resistance of the tube walls cause a pressure drop and corresponding velocity decreases below critical saltation velocity; the velocity where particles fall from suspension in the tube.

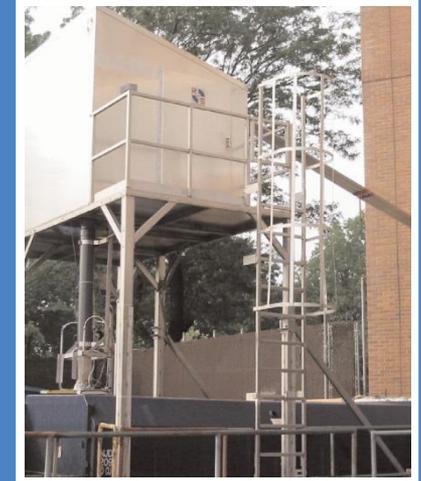
In poly dense phase systems, materials move below saltation velocity to form dunes and/or solid pistons in the conveying tube, but often border on the higher dilute phase velocities. As a result, conveying lines of 1.5" to 2" (40mm to 50mm) diameters transfer the same amounts of materials as dilute phase systems and require 70% less energy.

Spent caging materials and their properties vary considerably, making it difficult to project their conveying behaviors and confound standard designs. The selection of bedding materials to be used in facilities with dilute phase vacuum bedding systems have been limited to materials considered to have free flowing properties, such as corn cob and wood chip.

The poly dense phase conveying method, which is extensively used in the pharmaceutical and other industries, employs valved receivers. The limitation has been that bedding materials which are wet or cohesive have been considered incompatible with this approach.

The incorporation of a continuous flow thru separating valve in poly dense phase systems permits the handling of a wide variety of bedding products and conditions. Paper pulp and bedding products that have demonstrated to be beneficial to both the animal's welfare and research objectives tend to be friable and non-flowing. These bedding products which offer reproducibility and scientific validity of research findings can now be conveyed over long distances using this approach.

As a result, through careful empirical testing and design, and the addition of sophisticated state-of-the-art control and monitoring, soiled bedding removal systems with lines of 700 feet have been installed and are operational today.



▲ The VBRS 9400 poly phase vacuum conveying system serves two buildings with 700 foot removal line to ambient pressure, multi-purpose compactor.

For more information, visit www.smc-roe.com

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