



Whitepaper

## **Pneumatic Ship Unloading Plants for Poorly Flowing Bulk Materials**

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The pneumatic discharge of free flowing materials has been realised for nearly a hundred years. The situation with respect to poorly flowing materials is rather more difficult; until recently manual labour was used to loosen the product in the region of the suction nozzle. The author considers two loosening systems offered by Bühler-Miag to overcome this problem and gives examples of their use.

During the second half of the last century the English engineer F.E. Duckham demonstrated the possibility of unloading grain from ships by means of suction the principles were contained in several patent specifications. As Port Director of London he erected the very first pneumatic discharger "Mark Lane No. 1" in 1893. Five years later in 1898, Messrs. Luther of Braunschweig constructed the first grain discharging plant on the Continent. The pneumatic conveying system was known as "Flight Conveying" and was suitable for all pourable materials. Fig. 1 shows an older steam discharging plant in operation. The situation with regard to non-pourable, "difficult" materials is not as simple and extensive problems arise when trying to unload these from ships using pneumatic conveying systems. This article considers these problems and some means of overcoming them.