Advanced Developments in Battery Materials Conveying Systems

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ABSTRACT

One of the highest priorities in battery materials conveying is avoiding ferrous metal contamination in a "parts per billion" concentration range. The consistencies of critical battery materials vary significantly between powder like materials (i.e. Lithium, Graphite) on one side and high density, crystalline materials (NiSu, CoS, etc) on the other end of the spectrum. The requirements for a gentle, low-degradation conveying method are same for these product categories.

The Aero-mechanical Conveyor (AMC) is a unique material handling conveyor system for dry powders and granules. Its specific operation method makes it particularly suited for a battery metal conveying requirement. The working principle of the technology can be described as follows:

A small shaft-mounted gearmotor drives an internally circulating rope assembly within the conveying tubes at high speed. Due to the high-speed movement, air within the tubes slips past the polymer discs mounted to the rope assembly. This creates a turbulent flow low-pressure pocket behind each disc which suspends the bulk material while it is conveyed rapidly but gently to a collection point. The AMC's fluidizing technology, low wear rate, fully sealed design and a host of other distinctive attributes make it the perfect materials handling solution for hazardous or environmentally sensitive materials. The construction methodology is adaptable to a range of product-contact materials, further reducing the risk of ferrous contamination.

The presentation includes results of simulations as well as demonstrations of practical battery material conveying examples.