

RETHINKING POWDER HANDLING IN CRITICAL MINERALS PROCESSING: DESIGNING FOR ROBUSTNESS AND VALUE RETENTION

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ABSTRACT

The increasing demand for critical minerals, encompassing lithium, nickel sulphate, rare earths, graphite, and vanadium, underscores the importance of overcoming operational hurdles in mineral refineries. Effective powder handling at the end of the production stream is essential to maintaining the integrity of these valuable products and ensuring consistent plant operation.

Conveying systems play a central role in the quality of the final product. Impurities in the input materials and suboptimal conditions during mineral processing can lead to sizeable and expensive complications, including agglomeration, surface deposition, and moisture problems, potentially disrupting operations and impacting the quality of the final product.

To mitigate these risks, a shift in design philosophy is required, from anticipating optimal conditions to preparing for worst-case scenarios. Incorporating strategies in the process, such as redundancy lines, inline material conditioning, non-stick coatings, and strategic maintenance measures, can significantly enhance plant resilience. Furthermore, acknowledging powder handling as an integral part of the process, rather than an ancillary concern, is vital for ensuring robust and efficient operations.

The stakes are high, considering the commercial value of these critical minerals. Any compromise in product integrity due to structural damage, contamination, or operational disruptions can lead to major financial losses. Investing in resilient plant design and robust powder handling systems contributes to maximising returns while safeguarding both the integrity of these valuable mineral products and the continuity of refinery operations.

This presentation delves into downstream processing, highlighting the critical role of innovative, industrial powder handling systems to ensure value retention and operational reliability in the processing of critical minerals.

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