



Maximizing Bulk Material Handling Efficiency with Curved Conveyors

September 1, 2021

Mining operations require the transport of raw materials over significant distances. From the extraction of valuable minerals and other geological materials from the earth, through various processes of crushing, smelting,

filtration, tailings and overburden disposal, and rail car or ship loading, the distances can easily exceed ten to twenty miles. Frequently requiring the traverse of rough, mountainous and fragmented terrain with extreme differences in height, crossing creeks, roads, private property and populated areas, the transport of these raw materials demands a high level of planning and engineering, long-term costing and environmental management that can pose a significant challenge for mining operators.

Sponsored content by:



How to move bulk materials from the mine to downstream processes and shipping is, of course, a vital facet of plant engineering. Every mine has to assess its own requirements and circumstances relating to the transport of these bulk materials. But for overland movement of raw materials over sizable distances of miles to tens-of-miles, two options are prevalent – trucking and overland belt conveying.

Although trucking has been a method of overland transport used widely in mining, in rough terrain the movement of raw materials by truck involves difficult routes with tough topographical challenges, requiring significant effort and costs. Concerns over environmental impact increasingly weigh against trucking as an overland option largely because of CO2 emissions.

Transport of bulk materials over significant distances via [overland belt conveyors](#) can provide an extremely cost-efficient solution when compared to trucks for moving these materials from point to point. Advances in overland conveying technology have improved efficiency, reduced capital and operating costs, and made the conveying process more environmentally friendly and sustainable. One important metric that supports this is the cost for transporting material, which is \$2 – \$3 less per ton using overland conveying compared to trucking, factoring in capital expense and operating

costs. These factors have made overland conveying a considerably more attractive and economically feasible option versus trucking.

Photo: Beumer

CURVED OPEN-TROUGHED OLBCS

Since their introduction almost 50 years ago by [BEUMER Group](#), curved open-troughed overland belt conveyors (OLBCs) have evolved into being the most reliable and proven method to transfer mined raw materials like ores, waste rock and overburden, over long distances and challenging topography. Design improvements in OLBC technology like drone mapping, 3D planning/animation and IIoT connectivity, have enabled increased routing flexibility, tighter curve radii, longer conveyor distances, increased throughput rates, reduced energy usage and minimized environmental impact. Today, state-of-the-art OLBCs are critical systems supporting mining efforts worldwide, delivering high process reliability at low operating costs per ton.



Curved, open-troughed overland belt

conveyors are suitable for conveying any type of bulk material that must be transported quickly across vast distances and through, but not limited to, rough terrain. With extremely tight curve radii and large center distances, these systems enable very high throughput and high tonnage flows of heavy bulk materials. Different materials can be conveyed in the upper and lower strands of the conveyor at the same time, making OLBCs particularly flexible and efficient.

Mining operators require material handling equipment that is designed to fit their specific requirements, capable of handling higher capacities, and reliably operate 24/7/365 at the lowest possible costs. Supporting this, OLBCs can deliver conveying capacities of 500 to more than 10,000 tons per hour, at throughput speeds up to 7.0 meters per second, with nominal failure rates and long system durability, ensuring compliance with the highest quality standards.

Curved, open-troughed OLBCs, because of their size and critical function in the mining supply chain, are designed to embrace these factors to the extreme, fulfilling the most demanding specifications by employing the latest technology, and utilizing fewer components that require minimal maintenance.

SEEING THE BIG PICTURE

The most successful OLBC systems are those that most closely approximate the needs of mining companies, with low investment costs and short amortizations, while operating with maximum uptime and throughput, at the lowest cost per ton.



To achieve a highly successful curved, open-troughed OLBC, however, requires a comprehensive perspective on the entire performance of the project, from the very beginning. This needs to encompass a thorough system profiling including surveying and right-of-way consulting; through the highly-specialized analytics to determine belt tension and curve radii; to maximizing energy savings; minimizing noise reduction; and implementing systems to standardize components and streamline system maintenance.

The best option to achieving this expectation is with a singular, [dedicated partner](#) with considerable experience who can guide the process through every step to ensure sound decisions.

Only then can mining executives expect to realize a totally integrated OLBC system that operates with the above performance expectations.

This page was produced by North Coast Media's content marketing staff in collaboration with BEUMER. NCM Content Marketing connects marketers to audiences and delivers industry trends, business tips and product information. The Pit & Quarry editorial staff did not create this content.