



Technical Article

Transport with large Conveyors in Surface Mines

Edited by on 18. Oct. 2023

[Published in bulk solids handling, Vol. 2 \(1982\) No. 1](#)

An attempt is made to differentiate between the criteria usually required for the design of conveyor systems under ordinary operating conditions and those with which open-pit planners will be increasingly concerned in the future. Based on the well-known relationship between lifting power requirements, the calculation of the power requirement for conveyor equipment is shown by calculating the local belt pull.

In the early fifties conveyors increasingly 'gained ground' in lignite open-cuts. They were not only used as stationary but also as shiftable systems for mining and dumping faces. In this way the typical conveyor characteristics of continuously transporting large bulk material masses up gradients, which until then had been considered too steep could be utilized. However, the special conveying condition of Individual flights over the length of a straight face had to be taken into consideration. Arrangement in curves, although possible in some cases, will not be dealt with in this connection.

By connecting conveyor flights into lines and combining these systems, the conveyor developed into a high capacity transport system which naturally led to a correspondingly complex distribution of mined material.

In lignite open-cuts, conveyor systems essentially displaced rail transport from its then dominating position; and in other open-cuts they became a challenge to

heavy truck transport owing to increasing mining depths and greater volumes of bulk material having to be handled. Finally, this situation also applies to hard rock open-cuts and not only to intermediate and discharge transport but also at the face itself.

From Fig. 1 it can be seen how the configuration of the deposit dictates the way of opening up a mine. It shows that considerable use of conveyor equipment is required where great quantities of overburden cannot be directly overthrown to the dump owing to the wide opening of the open-cut, or where the overburden has to be carried outside the mine in any case.

Lump size limitation for conveyor transport in hard rock open-cuts can be largely overcome by using crushers for "intermediate treatment".