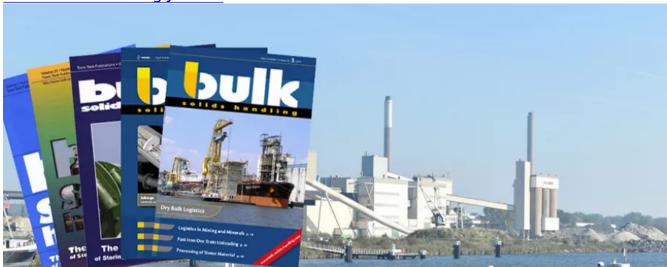Research Paper

Particle Degradation of ROM Coal and Washery Tailings up to 63 mm Size with Horizontal Hydrotransport

Edited by on 22. Oct. 2023

In the hydrotransport of materials with a wide range of particle sizes the degradation of the feed during transport is of paramount importance. The test rig at Bergbau-Forschung has been used to investigate a wide range of material and equipment parameters in their effect on the production of fines. This article reviews the progress of this research and describes some important findings.

The test rig for hydrotransport at Bergbau-Forschung was installed particularly for handling coarse solid matter up to a maximum particle size of 100 mm. The pipeline in service is of ON 250 type and has a length of 235m so that ROM coal and washery tailings up to 80 mm granular size can be put through. A pipeline diameter of 350 mm will be installed in a later extension phase. Details of the test rig design and of test performance will not be given here since they were comprehensively dealt with earlier (1, 2 3].

With the aforesaid wide range of sizes it goes without saying that when investigating the transport behaviour of these solids special emphasis has to be laid on particle degradation. This is because when assessing the economics of hydrotransport the costs of dewatering and water treatment are of critical

importance not only with suspensions to be conveyed over long distances, but also with coarse material transported over only short distances. These costs soar with decreasing granular sizes [4] which explains why enrichment of the slurry by fines < 0.63 mm plays an important part. Our main objectives, therefore, were to identify the parameters promoting the formation of fines and to try to find a way of keeping the proportion of fines within acceptable limits for hydrotransport.

Several test series were therefore carried out at Bergbau-Forschung to investigate particle degradation as a function of different parameters.