SAIMM
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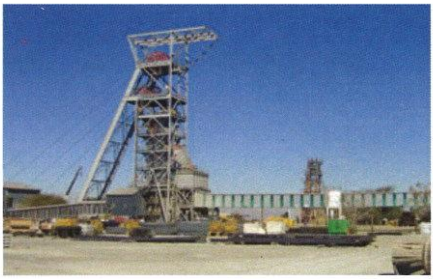
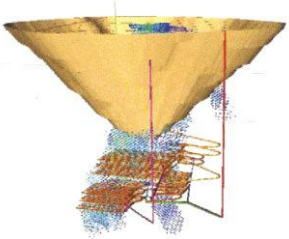
MPES 2015

'Smart Innovation in Mining'



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A review of diagnosis of steel cord conveyor belt cores condition, with applicability to puncture resistance and operations in Poland

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In the Belt Conveying Laboratory (LTT) at the Faculty of Geoengineering, Mining and Geology at Wroclaw University of Technology, research into conveyor belt resistance to punctures has been carried out for many years. The laboratory has developed its own methodology of research, because there are no standards governing the manner in which it should be conducted. Consequently, the results from different research centres are not comparable with each other. Despite this, the results of investigations of belts from different manufacturers and having different construction are valuable for producers and users, as they allow for better selection of belts for particularly harsh working conditions and to provide the longest trouble-free operation in such environment. Unfortunately, despite previous attempts at belt life prediction based on the designated boundary energy destroying belt covers and cords, a revised method for determining how differences in belt puncture resistance translate into differences in their durability have not been developed to date. Currently, for several years, the faculty has undertaken advanced research to develop an integrated diagnostic device allowing for assessment of conveyor belt condition during operation. This creates an excellent opportunity to compare different belts not only during static laboratory tests, but also in the course of damage formation on conveyors working in different conditions (with different length, belt speed, the type of ore, *etc*). Investigations of belt condition changes in different periods should allow for linking the results of belt resistance to puncture with their service life, and it is possible to assess whether belt design modifications as well as changes to the construction of transfer points entailing an increase in the cost will be recouped by reducing emergency stops due to belt failures and extending belt durability, thus reducing replacement costs. It should also lead to reliable prediction methods that take into account the influence of differences in belt resistance to punctures during their service life based on the observations of the actual process of their degradation during operation as determined by means of an integrated belt diagnostic system.