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DC- SP- ETVS- Dynamic characteristics and screening performance of an equal-thickness vibrating screen

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Screening is the key unit in coal processing and utilization. Recently, equal-thickness screens characterized by a large capacity and high efficiency have been extensively used. Conventionally, equal-thickness screening is achieved by changing the inclinations of each stage or adjusting the exciting force. In this paper, a single-deck equal-thickness vibrating screen (ETVS) driven externally by an unbalanced two-axle excitation with a large span is proposed, and a set of dynamic equations governing the motion of the screen are also presented. The vibration data was obtained using a vibration test and analysis unit, and the bed stratification and particle behavior on the screen were obtained by image acquisition using a high-speed camera and data analysis unit. Screening experiments were conducted to evaluate the classification performance of the ETVS with a variable amplitude. The results showed that the amplitude of the vibrating screen driven by an unbalanced excitation with a large span showed a decreasing trend, and a constant bed thickness was obtained throughout the deck. The ETVS has advantages of a high screen deck utilization and an efficient classification. Compared to the normal vibrating screen (NVS), the screening efficiency of the ETVS increased by 3.05%–8.76%. The screening performance of the ETVS is obviously better than that of the NVS, especially when dealing with a large amount of materials and those with high moisture.

Biography

Jinpeng Qiao is a PhD candidate from China University of Mining and Technology (CUMT), and his major is Mineral Processing Engineering. His supervisior is Professor Duan Chenlong, an expert of Clean Coal Technology and Dry Separation Theory and Technology.

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