

عنوان مقاله:

Vibration and Noise Reduction Optimization Design of Mine Chute with Foam Aluminum Laminated Structure

محل انتشار:

ماهنامه بین المللی مهندسی، دوره 33، شماره 8 (سال: 1399)

تعداد صفحات اصل مقاله: 9

نویسندگان:

K. Yang - College of Mechanical Engineer and Automation, Liaoning University of Technology, Jinzhou, China

J. Zou - College of Mechanical Engineer and Automation, Liaoning University of Technology, Jinzhou, China

J. Shen - College of Mechanical Engineering, Liaoning Technical University, Fuxin, China

خلاصه مقاله:

The mining chute is an important equipment in the process of coal transportation and coal screening preparation. During the working process, the mining chute will generate a lot of vibration and noise because of constantly friction and impact of gangue and coal blocks. In order to reduce the vibration and noise during the operation of the chute, a new type of foam aluminum laminated structure is used to manufacture the mining chute. According to the characteristic of chute, the laminated structure is optimization designed by taking the vibration amplitude as the objective function, the thickness of the steel plate and the foam aluminum core plate as the design variables. And then, the vibration and noise reduction performance of two type chutes are carried out by using experiment and finite element simulation method. The results show that the using of foam aluminum laminate structure to manufacture the chute can obviously increase the damping ratio of the system, which can effectively reduce the vibration amplitude of the chute. And the average sound insulation performance of foam aluminum laminated chute is better than prototype chute, especially in the middle and high frequency section, which can be reduced by about 7.1 dB on average comparison with prototype chute. So, it can be seen that the foam aluminum laminated structure chute has a more significant sound insulation and vibration reduction effect than the prototype chute.

کلمات کلیدی:

Chute, foam aluminum, Vibration Reduction, Noise Reduction, experimental research

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1040933>

