# RIDE COMFORT EVALUATION OF VIBRATORY ROLLER UNDER DIFFERENT SOIL GROUND)

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TÓM TẮT:

Adam D Kopf F Bekker ISO2631-11997E

Abstract:

In realistic working conditions, a vibratory roller operates and moves on various kinds of soil ground and when it does vibration excitation sources, such as soil ground, drum and engine are transmitted to the driver through the isolation systems of the cab and seat, which has direct influence on the driver's health and their working efficiency. Thus, in order to evaluate the riding comfort of a vibratory roller under the different soil grounds, a nonlinear dynamics model of a single drum vibratory roller was established in this paper, based on the analysis of the contact physics of the wheel with different soil grounds. In order to describe the vertical excitation force acting on the front frame generated by a vibratory drum with elastic-plastic soil, a 3-DOF vibration model which describes vibratory drum operating is developed in this study, based on Adam D. and Kopf F's elastic-plastic soil model. Using Bekker's hypothesis of the soft soil ground, the tire- deformation soil surface contact model was established to analyze the vertical excitation force acting on the rear frame. Matlab/Simulink software was used to simulate the nonlinear dynamic models and calculate the values of the vertical weighted r.m.s acceleration responses of driver's seat and cab. The nonlinear dynamics model of the whole vehicle was analyzed according to the ISO 2631: 1997 (E) standard, the influence of noise and vibration to human health which evaluates the influence of the different road conditions, operating conditions, and vehicle speeds on the driver's ride comfort. The results showed that the rigid road surface roughness level has a greater influence on vibratory roller ride comfort that a driver subjectively feels is very uncomfortable when the vehicle moves on a poor road surface roughness. The deformation of the road surfaces dominate cab sloshing when a vehicle moves on relatively soft soil road surface. And in a low frequency region, vehicle ride comfort becomes worse when there are vibratory compacts and moves on elastic-plastic soil. The study can provide a reference for vibration roller

ride comfort design.
Key words: computer simulation, dynamic models, riding qualities, evaluation, vibratory roller, soil grou