Contents

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EDITORIAL

ARTICLES

Dynamic Analysis for Damping Systems Designated to Insulate Noise and Vibration in Case of Tram Rail

Polidor BRATU
Universitatea "Dunarea de Jos" din Galati
Facultatea de Inginerie din Braila
Calea Calarasilor 29, 810017 Braila, Romania
email: bratu.polidor@ugal.ro

This paper is focused on the main static and dynamic characteristics in case of rubber elements designated to damp the vibrations transmitted by means of the railway to the surrounding buildings. Thus, the experimental methods performed on a stand having harmonic excitation in case of actual loading under dynamic regime both stationary and transient attaining the resonance point are presented. Basing on this the system dynamic parameters such as: dynamic rigidity, critical damping fraction, dissipation coefficient (histeresys), can be determined. Aiming this the free damped vibration method and the controlled excitation method with monotone increasing variation for the excitation frequency have been determined. In this way can comparatively be determined both the rigidity and the damping dynamic characteristics of the rubber for various manufacturing receipts taking into account the chemical composition as well as the manufacturing process. Finally, the paper presents experimental results obtained by our research institute ICECON during the works carried out for the tram rails in Bucharest, Romania.

Analysis of Polyharmonic Spectral Composition of the Vibrations Transmitted to Human Body

Aurelia MIHALCEA
Universitatea "Dunarea de Jos" din Galati
Facultatea de Inginerie din Braila
Calea Calarasilor 29, 810017 Braila, Romania
email: cinetic@icecon.ro

This paper deals with the behavior of nonlinear elastic systems whose dynamic response is characterized by polyharmonic vibrations while subjected to given (kinematic) harmonic excitations. Under this conditions, beginning with the stage of equipment conception, the numerical evaluation for the system response is necessary in order to determine the subharmonic and overharmonic components related to the excitation frequency. Basing on this, the level of the vibrations transmitted to human body could be assessed allowing to adopt the appropriate protection measures. This paper underlines that this approach can also be used in case the linear elastic system becomes nonlinear during operation. This results in changing of the response spectrum with negative impact upon human health and safety. The present paper presents actual cases of spectrum changing for the vibrations transmitted while operating the vibrating construction machinery where the additional subharmonic or overharmonic components exceed the rated level and affect the human body exposed to vibrations during the working process.

The Dynamic Study Reunited for Inertial Vibrating Screens and for Vibrating Mills Having the Vibration Generator Axial Mounted

Cristian PAVEL
Amelitta LEGENDI
Department of Technical Mechanics and Mechanisms
Faculty of Technological Equipment
Technical University of Civil Engineering
Calea Plevnei 59, 010223, Sector 1, Bucharest ROMANIA
Tel. +40 21 315 82 00

This paper focuses the proposal of one single dynamic model of theoretical study both in inertial vibrating screens' case and in the vibrating mills' case, the last ones having the vibration generator set coaxial with the mill's tube. This proposal is based on established similarities concerning the working mode of both outfits.
Using this unified dynamic model valid for both outfits, there have been established the motion's differential equations.
Next step was the experimental analyse of both vibrating outfits' dynamic answer that confirmed the concordance between the operating values experimentally determined and those analytically established, the existing differences being in permissible limits.

The Simulation of Flood and Relaxation Using Burgers Visco-Elastic Model

Cornel MARIN
VALAHIA University of Târgovişte, ROMANIA,
Adress: B-dul Libertatii, Bl. C3, ap.41, Targoviste 130018
email: marin_cor@yahoo.com

The ideal viscous-elastic continuous medium presents both elastic and viscous properties which can be pointed out using flood and relaxation experiments. The flood is the phenomenon of slow, progressive viscous-elastic medium deformations, when the test-piece is submitted to a constant load, which cause a tensile stress in the material. In the first moment an instant elastic strain under the action of this load, then a plastic strain occurs, which in time tends to a limit value called delayed strain. The phenomenon of relaxation of force means the progressive decrease of the load applied to the test-piece, respectively, the tensile stress, after the specific strain occured in the test-piece, keeping the strain constant. The present paper presents the results of flood and relaxation simulation using BURGERS visco-elastic model, which were both analitical obtained and using the simulation medium MATLAB SIMULINK

On the Natural Frequencies of Timoshenko Type Beams

Nicolae HERIŞANU
Polytechnic University of Timişoara, Department of Mechanics and Vibration,
1 Bd.M.Viteazu,300222 Timişoara,
herisanu@mec.utt.ro

Vasile MARINCA
Polytechnic University of Timişoara, Department of Mechanics and Vibration,
1 Bd.M.Viteazu, 300222 Timişoara, Romania,
vmarinca@mec.utt.ro

The present paper deals with the frequency equation and normal modes for six common types of simple finite beams. The solutions of motion of Timoshenko beams are obtained for two complete differential equations. The frequencies of Timoshenko beams are compared with the frequencies of Bernoulli-Euler beams.