Contents

RJAV

Romanian Journal of Acoustics and Vibration

A publication of the Romanian Society of Acoustics

Volume V, Number 1, June 2008

EDITORIAL

ARTICLES

Experimental research on the influence of wood species upon the frequency response of the lignocelluloses plates from the guitar construction

Mariana Domnica STANCIU
Transilvania University of Braşov, B-dul Eroilor nr. 29, Braşov 500036, Romania, Department of Strength of Materials and Mechanical Vibrations, mariana.stanciu@unitbv.ro

Nicolae CREȚU
Transilvania University of Braşov, B-dul Eroilor nr. 29, Braşov 500036, Romania, Department of Physic, cretu.c@unitbv.ro

Călin ROŞCA
Transilvania University of Braşov, B-dul Eroilor nr. 29, Braşov 500036, Romania, Department of Strength of Materials and Mechanical Vibrations, icrosca@unitbv.ro

Ioan CURTU
Transilvania University of Braşov, B-dul Eroilor nr. 29, Braşov 500036, Romania, Department of Strength of Materials and Mechanical Vibrations, curtui@unitbv.ro

This article presents the experimental results concerning the influence of wood species upon the modal shapes and the dynamic behaviour of the guitar plates. In order to perform the measurements were used plates (plywood and wood) from different wood species having the geometry of the guitar plates. These were supported on two soft foam blocks placed under the plates. The input force was provided by a mini shaker fixed on the bridge area. For each frequency generated there were determined: the modal shapes known as Chladni pattern and the frequency response of plates which was analyzed by means of the Fast Fourier Transform (FFT). It was noted that both wooden species and the main section of the wood influence the dynamic behaviour of the lignocelluloses plates at different frequencies.

Performance Requirements of the Elastic Supporting Systems intended for Construction Embedded Equipment

Polidor BRATU
Research Institute for Construction Equipment and Technology – ICECON S.A., 266 Pantelimon, 021652 Bucharest, Romania, icecon@icecon.ro

The paper deals with the performance concept that the vibration isolation systems should fulfil for the construction embedded equipment to be dynamically isolated from the structure. Thus, the rated and recommended values for the isolation degree in case of some noise and vibration- generating equipment connected with the structure of public interest buildings are presented.

Conformity Assessment in case of Construction Equipment concerning Noise Generated Inside and Outside the Cabin

Aurelia MIHALCEA
Research Institute for Construction Equipment and Technology – ICECON, Pantelimon, 021652 Bucharest, Romania, cinetic@icecon.ro

This paper presents experimental values for the noise generated by the engine, pumping group and working equipment, measured both outside and inside the cabin. Depending on the effective values of the noise level, the possibilities to frame within the permissible levels stated by the normative documents in force are evaluated.

A numerical approach of power analysis for the elastic mechanical systems with nonlinear damping

Nicuşor DRĂGAN
MECMET - Research Center for Mechanical Machines and Technological Equipment
"Dunărea de Jos" University of Galaţi, Engineering Faculty of Brăila
29 Calea Călăraşilor, 810017 Brăila, Romania, e-mail: ndragan@ugal.ro

This study is both a qualitative and a quantitative approach of the nonlinear vibrations of the mechanical elastic systems with polynomial damping. It gives the physical and mathematical modeling and numerical simulation of the dynamics of one degree of freedom mechanical systems and shows the diagrams of the curves of different characteristics (amplitude, displacement, power) function of the polynomial coefficients of damping. It also shows the variation of the same characteristics function of the frequency of the harmonic force of excitation. The numerical simulation has been done with the data of a real technological equipment: an industrial conveyor driven by inertial vibrator which has tested in site by the specialists of The Research Center of Machines, Mechanic and Technological Equipment – MECMET and those of The Research Institute for Construction Equipment and Technology- ICECON S.A..

Consideration to Show the Application of ANSYS Code at Percussive Action

Cristina OPRIŢESCU
ICECON Bucureşti-Research Department Timişoara, opritescucristina@yahoo.com

Mihai Ilie TOADER
ICECON Bucureşti-Research Department Timişoara, toader@mec.upt.ro

The analysis of the impacts of elastic bodies is topical and it has many applications, practical and theoretical, too. Efficiency of FEM concerning the numeric simulation supplants the experiment at the simple case pending the complex attempts. Therefore, in the presented paper, the situation of elastic collisions is put into evidence by the simulation by means of the program ANSYS.

Dynamic Behaviour Analysis of the Traction Systems in Interaction with Road - Approaches based on Single Freedom Degree Model

Adrian - Sorin AXINTI
University "Dunarea de Jos" of Galati, Research Center for Mechanics of the Machines and Technological Equipments, Calea Calarasilor 29, 810017, Braila, Romania, axinti@ugal.ro

Silviu NASTAC
University "Dunarea de Jos" of Galati, Research Center for Mechanics of the Machines and Technological Equipments, Calea Calarasilor 29, 810017, Braila, Romania, snastac@ugal.ro

Gavril AXINTI
University "Dunarea de Jos" of Galati, Research Center for Mechanics of the Machines and Technological Equipments, Calea Calarasilor 29, 810017, Braila, Romania, gaxinti@ugal.ro

This study deals with the numerical simulation of equipment with full hydrostatic driving system. Based on the classical single degree of freedom model, there was developed a new practical simulation model, named SYMTRAX-I, for the technological equipment with integral hydrostatic driving system. By means of this model there was simulated the kinematic excitation phenomenon generated by the road. The complexity of this analysis consists in the fact that specific dynamic phenomenon appears at the interaction between the system framed from the road, tire wheels drive devices and the equipment insulated on the tire wheels, and the rolling system, with traction transmission and the base machine engine. This paper presents the SYMTRAX-I model, the simulation hypothesis, the computational results, and the comparative analysis between the instrumental tests and the simulation results.

Dynamic Behaviour Analysis of Traction Systems in Interaction with Road - Approaches based on Two Freedom Degree Model

Adrian - Sorin AXINTI
University "Dunarea de Jos" of Galati, Research Center for Mechanics of the Machines and Technological Equipments, Calea Calarasilor 29, 810017, Braila, Romania, axinti@ugal.ro

Silviu NASTAC
University "Dunarea de Jos" of Galati, Research Center for Mechanics of the Machines and Technological Equipments, Calea Calarasilor 29, 810017, Braila, Romania, snastac@ugal.ro

Gavril AXINTI
University "Dunarea de Jos" of Galati, Research Center for Mechanics of the Machines and Technological Equipments, Calea Calarasilor 29, 810017, Braila, Romania, gaxinti@ugal.ro

This study deals with the numerical simulation of equipment with full hydrostatic driving system. Based on the classical two degree of freedom model and on the SYMTRAX-I single degree of freedom virtual prototype, it was developed a new complex simulation model, named SYMTRAX-II, for the technological

equipment with integral hydrostatic driving system. With the help of this model it was simulated the kinematic excitation phenomenon generated by the road. The complexity of this analysis consists in the fact that specific dynamic phenomenon appears at the interaction between the system framed from the road, tire wheels drive devices and the equipment insulated on the tire wheels, and the rolling system, with traction transmission and the base machine engine. This paper presents the SYMTRAX-II model, the simulation hypothesis, the computational results, and the comparative analysis between the instrumental tests and the simulation results. The concluding remarks contains also a comparative analysis between SYMTRAX-I and SYMTRAX-II virtual models.

Study of structural elements influence on acoustic absorption coefficient in the case of sandwich composite panels

Vasile MOGA
Phd. Reader - University "Politehnica" of Bucharest, ROMANIA

Marius DUMITRAŞ
Phd. Assistant - University "Politehnica" of Bucharest, ROMANIA

The article presents the variation of acoustic absorption coefficient when the honeycomb cells dimensional parameters are modified in the case of sandwich composite panels. Multifactorial mathematical models defined with the aid of response surface method applied on a group of acoustic absorption coefficient experimental values, are destined to establish the optimal specific dimensions attenuation of the incident sound wave.