

SOFTWARE ANALYSIS OF INFLUENCE OF ITEMS OF PROCESS MACHINERY PRODUCED ONTO ACOUSTIC CHARACTERISTICS OF INDUSTRIAL PREMISES

The authors argue that irregular geometrical patterns of industrial premises and items of the process machinery installed in industrial premises cause redistribution of the acoustic energy and its essential acoustic properties, including the average free path length, the reverberation time, and the average sound absorption coefficient. Any failure to take account of the above influence causes errors in identification of the sound pressure intensity and in assessment of efficiency of design and acoustics-related actions aimed at noise reduction that incorporate sound-proof facing.

The authors present the results of simulation of acoustic processes in the premises that have items of process machinery installed, and analyze their influence on the sound absorption intensity. The software developed on the basis of the beam tracing method is designated to assess the influence of patterns of arrangement of items of equipment onto acoustic parameters of premises. The software comprises independent modules designated for the simulation of acoustic processes in different premises that demonstrate different acoustic properties. The results of the research demonstrate that the software simulation of noise processes on the basis of the method of beam tracing is an effective tool that may be effectively applied in the analysis of noise patterns inside industrial premises. The software may be employed to identify integrated acoustic patterns inside industrial premises with account for the influence of dimensions of premises, characteristics of items of process machinery capable of disseminating sounds, etc. and other factors of significance in terms of the distribution of reflected sound energy. Presently, advanced software is being developed on the basis of the proposed method of noise assessment in the premises that have irregular geometrical patterns.

Key words: average free path length, reverberation time, sound absorption coefficient, industrial premises.

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