

**IMPLEMENTATION OF MODERN ACOUSTICAL INSULATION
MATERIALS IN HOTEL**

Matviyk A. M.

Sobin O.V

Senior Lecturer

National University of Food Technology, Kyiv, Volodymyrska 68,01033

Summary. In this work the tendencies and prospects of introduction of innovative technologies in hotel industry are investigated. The necessity of development and introduction of innovative acoustic technologies in hotels is confirmed.

Keywords: innovation, hotel, technology, acoustic insulation materials.

Introduction. For most modern hotels, providing a comfortable acoustic environment is currently one of the main functional requirements. Acoustic properties of the room significantly affect the nature of the sound reproduction in it.

One of the main criteria for assessing the acoustic quality of the room is the reverberation time (RT60). With its great meaning, the perception of music is distorted, the legibility of the language diminishes, with very little - there is the effect of "loneliness" of the room, "dryness" of the reproduced works. Ensure optimal reverb time (or adjust it) in most cases allow modern acoustic materials and designs, which help create additional sound absorption in the room.

To provide the necessary sound absorption, the greatest attention is paid to the ceiling space. That is why it is already quite long ago produced "acoustic" ceilings that absorb sound. In large rooms, where there is not enough ceiling space to improve acoustics, it is also recommended to use sound absorbing wall panels.

The technical characteristics of ceiling and wall sound absorbers include: acoustic and hygienic indicators, moisture resistance, fire performance, shock resistance, lighting performance and durability.

In accordance with these aspects, the aim was to consider the above-mentioned issues and present the results of research that determine the essence of innovation policy and innovative solutions in the field of tourism, identify the main trends of

development, directions of innovation policy and provide methodological tools for assessing the effectiveness of innovation policy.

Basic text. Safe noise levels in residential and public buildings are assumed to be 55 dB in the afternoon and 45 dB at night. The volume measurement procedure involves a rather complicated algorithm.

In the case of constant (background) noise it is necessary to understand the sound as waves propagating in the air with a certain frequency. Thus, in accordance with building codes SBN B.1.1 - 31: 2013, for each frequency band, the level of permissible sound pressure is determined. For simplicity of understanding otherwise the frequency of propagation of sound vibrations can be estimated as the height of sound.

Table 1

Permissible noise level

Building	Noise load level (dB) for frequency bands with average frequencies, Gz								Noise level, dB
	63	125	250	500	1000	2000	4000	8000	
Hotel	55	44	35	29	25	22	20	18	20
Territories adjacent to the hotel	59	48	40	34	30	27	25	23	35
Restaurant	75	66	59	54	50	47	45	43	55
Shop, gym	79	70	63	58	55	52	50	49	60

Noise-protection measures applied at enterprises are subdivided into collective defense (HRS) and personal protection (PPE) facilities.

First of all, we must use collective means that, in relation to the source of noise, are subdivided into means of reducing noise in the source of its origin, and means that reduce the noise in the way of its propagation from the source to the protected object. The most effective measures that lead to the reduction of noise in the source of its occurrence. Fighting noise after its occurrence is more expensive and often ineffective.

When conducting a questionnaire with the worldwide network of hotels "Hilton", it was discovered what kind of noise interferes with the rest of the most all clients of the hotel, fig.1

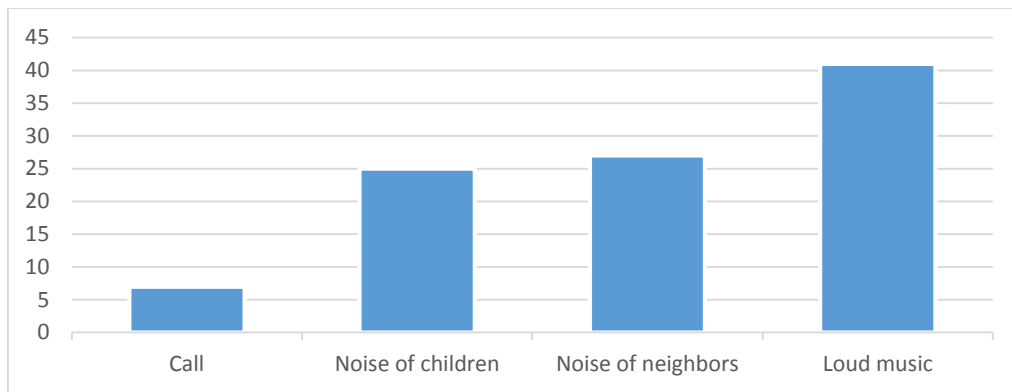


Figure 1. The noise that interferes most

Also, research was conducted on the favorable noise and found that the noise helps clients relax, fig. 2.

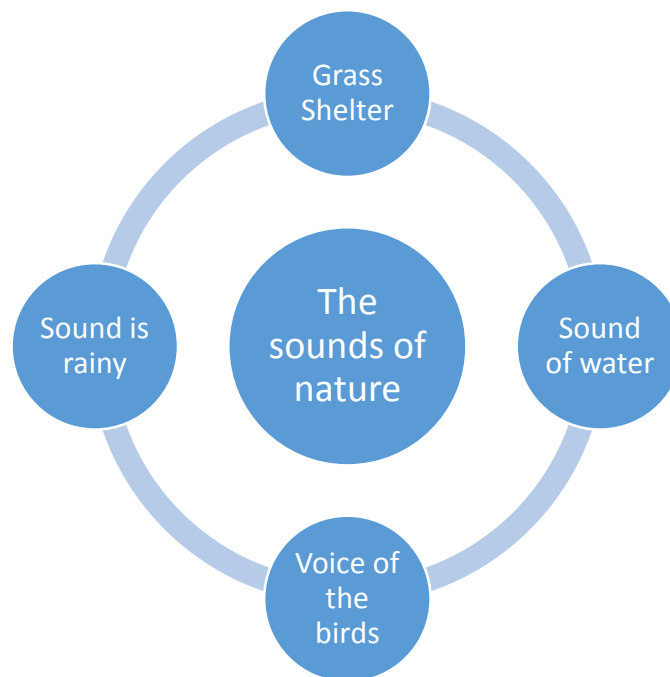


Figure 2. Favorable sounds for relaxation

The design hotel will use the latest developments in the field of acoustic insulation materials of the brand Rockwool (Denmark). This brand is today one of the best represented in the Ukrainian market.

The main components of such boards are Portland cement and fine-grained fillers (quartz sand, ash TPP, ground slag, wood flour). As a powder formulation, aluminum powder is used. The peculiarity of the technology for producing acoustic plates from aerated concrete is the creation of a high-porosity structure with combined pores, which is achieved by introducing an increased amount of gasifier and increasing the amount of water in the preparation of aerated concrete. As a result of such technological

operations, sound absorbing plates with an average density of 300-350 kg / m³, and a compressive strength of not less than 0.8 MPa are produced. Acoustic properties of aerated concrete plates are given in Tab. 2.

Table 2

Reverberation coefficient of sound absorption of aerated concrete slabs

Frequency, Gz	125	250	500	1000	2000	4000
Sound absorption coefficient	0,11 – 0,31	0,25 – 0,48	0,36 – 0,65	0,4 – 0,87	0,49 – 0,95	0,61 – 0,99

For the arrangement of the underlying floor in the hotels, a multilayer construction, consisting of 5 cm of foam, a leveling reinforcement with or without reinforcement, and a thin layer of self-leveling solution is most often used. This base is covered either with linoleum, laminate flooring or parquet. It is believed that such a design provides sufficient sound and thermal insulation of the ceiling and is the most optimal.

However, trials show that this is not always the case. As for the insulation, then no objections arise. In determining the same total reverberation coefficient it is established that its value for this design in the region of high frequencies does not exceed the value of 0.65. This indicates that the high-frequency sound oscillations are not sufficiently absorbed by foam plastic and, accordingly, the comfort in such rooms is deteriorating.

One of the reasons for our opinion is that foam, especially low grades, is easily deformed under the influence of external loads on the floor, with porosity and pore size decreasing. Thus, the analysis of the condition of the floor with foam has shown that after a year of operation in a room with a lot of heavy furniture, the thickness of the foam layer decreased by 25%. This, in turn, worsened the sound-insulating properties of such a design.

In order to achieve optimal acoustic effect when laying floors of inter-floor ceilings, the design hotel will combine soundproofing and sound absorbing materials.

So, when using foam, the floor should be "floating" and should consist of at least two layers of foam of different grades. This builder, as a rule, never adheres to, because of the complexity of manufacturing such a design. However, this hotel will be used in the design hotel.

When using sound insulation panels from aerated concrete, the design of the "floating" floor is simplified, there is no sinking in the layer of aerated concrete, effective absorption of sound is provided due to different density, dynamic modulus of elasticity and deformability when combined soundproof material - aerated concrete and sound absorbing - quartz sand.

Conclusion.

Consequently, on the basis of the foregoing, one can conclude that, at the present stage, the hotel business is characterized by a diversification of its activities and a creative approach. New technologies of building construction are rapidly developing, new segments of the market are emerging that satisfy the diverse demand of tourists. In the competitive struggle between hotels, the uniqueness and uniqueness of hotel facilities is of considerable importance.

Innovation is our future. Not all hotels today are adapted for the latest technical innovations, but all, regardless of the time of their construction, can find the opportunity to use a variety of innovative solutions. The main thing - to think about what you need or do not need your guest and that will work not only on economy, but also on the formation of a positive image of the hotel itself and the state as a whole.

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