Sustainable Optimum acoustic Interior Design Solution For Renovation Speech Closed Spaces

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Abstract:

The speech closed interior spaces are distinguished from other closed interior spaces by almost the usual fixed positions of both the sound source and the listener (Ex: students classroom, conference room, lecture hall, etc). Thus, it is possible to acoustically help both the speaker and the listener through the usage of proper acoustic interior design for the space. The main acoustic defect which the listener in the speech closed indoor spaces always complain of is that speech intelligibility is particularly poor. This is normally due to the noise, the uncontrolled sound
direction and the reverberation time which is too long. As a result of factors these factors the speech intelligibility cannot often be met by all the seats. Also, in speech closed interior spaces, although the areas of acoustical treatment (reflective, absorptive and diffusive) were adequate, they might not be placed correctly in the ceiling, walls and floor and so not effective to reduce noise, control sound direction and addressing other acoustical issues arising in the interior space. Hence, speech closed spaces should be Architecturally designed according to the latest knowledge concerning the acoustical requirements. In the case of renovations, for various reasons, the acoustics of speech closed interior spaces often do not fulfill the acoustical requirements. A listener cannot be affected and convinced efficiently by what the speaker says if he/ she cannot hear the speaker clearly. So, the relationship between the speaker and the listener will be damaged. Acoustic interior design has a role concerning the proper management of such problem to improve such closed spaces. In this paper, to address this defect to improve intelligibility in speech closed interior spaces, the author considered new appropriate optimum acoustic interior design solution for the ceiling, walls and floor.

**Problem:** Difficult speech communication is considered a common issue in many speech closed spaces such as conference rooms, lecture halls, student’s class rooms, etc. Numerous listeners are suffering from poor speech intelligibility. The listener cannot be affected and convinced efficiently by what the speaker says if he cannot hear the speaker clearly, thus, the relationship between the speaker and the listener will be damaged, also The areas of some acoustical treatments using reflective, absorptive and diffusive materials to reinforce sound and decrease noise may not be placed correctly on the ceiling, walls and floor of the speech closed interior space and so they are not effective.

**Objective:** introduce an optimum acoustic interior design solution to improve speech intelligibility for speech closed spaces leading to a uniformly diffused strong sound field, free of any defects, arriving to all listeners, and thus a good acoustical environment and present a sustainable strategies to obtain efficient use of energy and efficient use of materials.

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