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Analytical Survey of Acoustical Material's VOC Emission and its Installation in Auditorium

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Abstract

Human being is a social animal and from the ancient times, gathering spaces are playing an important role in our society. Indoor and outdoor spaces were built for social gatherings like open air theatres, multipurpose halls, auditoriums, religious places like temples, Mosques, Churches etc.

Auditorium is a hall or large building used for stage performances, public assembly or speeches. In auditorium there is need to get acoustical treatment properly. Basic acoustic criteria for all types of auditoriums are the same. It should have low ambient noise level from internal & external source, appropriate reverberation time, Avoid echoes, flutter etc. To full fill these criteria appropriate acoustical material for floor, ceiling & wall is necessary. Contemporary acoustical materials, paints & adhesive use for auditorium emit some amount of VOCs (Volatile Organic Compounds). High VOC content materials decrease productivity of occupant and also cause illness. Exposure to VOCs in indoor environment can causes indoor air quality related problems. It is essential to study VOC emission of different contemporary materials and suggest appropriate materials for floor, ceiling and wall of auditorium. In this paper, Acoustical materials along with VOC emission, Absorption coefficient for different frequencies & installation techniques have studied & analyzed various types of materials and installation techniques can be used for floor, wall & ceiling of auditorium.

Keywords; *Acoustical materials, VOC emission, Absorption coefficient, installation techniques*

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I. INTRODUCTION

Good acoustical design is a necessity in today's architectural environment. An auditorium is an essential one for Drama, performances and music programs. Acoustic comfort is necessity of such a building. Absorption coefficient means the amount of any incident sound energy which is absorbed by the surface. Energy can neither be created nor destroyed, but it can be changed from one form to another is the law of conservation of energy. Absorption converts sound energy into heat energy. Sound level within rooms can be reduced but not between the rooms. When sound energy incident on any material some amount energy absorbed by the material. The measurement of absorbed energy is

called the absorption coefficient. Ratio of absorbed energy to incident sound energy is the absorption coefficient. Ratio of reflect to incident sound energy is the reflection coefficient. A material with absorption coefficient zero reflects all sound incidents upon it. Absorption coefficient is one when material absorbs all sound energy incident upon it. All materials absorb some sound energy, so this is a theoretical limit '1'. Sound absorptive materials are widely used in a various of conditions. Sound absorptive materials exist in different forms. (Shiney A, March 2015)

The noise reduction coefficient (NRC) or sound absorption coefficient values are different for different materials.