

# Guide for Sufficient Diffusion for Reverberation Time Testing of Unoccupied and Unfurnished Gymnasium or Modular Classrooms

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## Definition:

*Reverberation Time (RT) – an indication of the persistence of sound in a room, measured in seconds. RT is dependent on the volume of the space and the sound absorptive properties of the room surface.*

A large discrepancy between the commissioning test results for reverberation time (RT) compared to design expectations has been discovered in unoccupied and unfurnished K-12 school gymnasium and modular classrooms (test procedure outlined within ASTM E2235 – 04e1). Furthermore, the spaces where this phenomenon is occurring typically do not have evenly distributed, high NRC, acoustical surface treatment throughout the space. For example, all room surfaces are hard except for the high NRC ceiling (and perhaps some minimal upper wall absorption).

These unexpected reverberation time results are being primarily influenced by the lack of diffusion when measurements are conducted. To more accurately assess the RT criterion it is important to add diffusion in an appropriate amount to simulate the diffusion that would be provided by a classroom or gymnasium in realistic circumstances. The following procedures outline the way in which a minimum acceptable amount on diffusion can be introduced into these environments during reverberation time testing:

## Modular Classrooms (Unoccupied and Unfurnished):

Add 4, 4'x8' sheets of plywood (standard thickness such as 16mm to 19mm) evenly distributed through the room. The plywood should be positioned so that the long side is angled slightly (approx. 20 degrees) from vertical by simply leaning it against walls. Stagger the plywood so that sheets are not directly across from one another on adjacent walls.

Gymnasium (Unoccupied and Unfurnished): This can be accomplished by adding seven, 4x8 sheets of 16 mm - 19 mm plywood distributed throughout the gym. The plywood should be positioned so that the long side is angled slightly (approx. 20 degrees) from vertical by simply leaning it against walls and posts. Five sheets should be located against walls and two sheets should be located centrally. At least one sheet of plywood should interrupt perpendicular lines between each measurement location and the gym walls.

For more information assistance with this Guideline, please contact:

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