

Reverberation/Acoustic Control Specifications



There are basically two methods of arranging desired reverberation control: movable and immovable. Immovable techniques include carpeted walls and floors, permanent sound clouds, and wall or ceiling mounted acoustical panels. Immovable techniques must of necessity be planned for either a particular use (i.e.: always vocal music, or always small orchestra, etc.) or must be arranged for a "happy medium" which generally makes no-one really happy.

Movable methods include movable sound clouds, partitions, or free-standing structures, which can be re-arranged and "tuned" to the particular sounds in use or desired. Such systems may be ideal but budget problems and space limitations prevent their more general use in the typical school, as do the time and manpower to re-arrange for each differing use.

LuXout Acoustical Draperies offer an economical easy-to-use reverberation control system for school music suites and other areas such as TV studios. These attractive 25-oz cotton velour draperies are available in a wide range of standard or custom colors, are treated to be flame resistant to NFPA 701 standards, and offer decided sound absorption qualities.

Results of ASTM C423-09a Standard Test for Sound Absorption

Frequency (Hz)	125	250	500	1000	2000	4000
Absorption Coefficient	0.20	0.57	0.91	0.95	1.02	1.05

(Based on report of Riverbank Acoustical Laboratories. Complete report on request)

Hertz rang for instrumental music is generally in the higher range. For example, piccolo music is from 512 cps to 4608 cps; violin is from 192 cps to 3072 cps. A bass tuba ranges from 42 cps to 340 cps. For vocal music, a bass will range from 80 cps to 340 cps, and a soprano from 240 cps to 1200 cps. These are approximate ranges.

Typical Absorption Coefficient of Other Materials

Frequency (Hz)	125	250	500	1000	2000	4000
Unglazed Brick	.03	.03	.03	.04	.05	.07
Heavy Carpet on 40-oz foam	.08	.24	.57	.69	.71	.73
Coarse Concrete Block	.36	.44	.31	.29	.39	.25
Ordinary Window Glass	.35	.25	.18	.12	.07	.04
Asphalt, Rubber or Cork Tile on Concrete	.02	.02	.03	.03	.03	.02

(Absorption Coefficient is the fraction of impinging sound that does not return.)

Reverberation means multiple reflections within the room. Where reduced reverberation is needed, increased areas of acoustical materials are beneficial. but, where increased reverberation is desired, acoustical absorption should be reduced.

In general, vocal music, drama and speech require less reverberation than instrumental music. Therefore, an absorption system that produces less reverberation for vocal music would not necessarily be desirable for best results for instrumental music. What is needed for multi-purpose areas that adjust not only to the requirements of the specific activity, but also to the varying number of people in the room for differing activities, since the human body is in itself a sound absorption device. A school music room used for a small vocal group activity will have different reverberation characteristics than the same room used for a large instrumental group, even without any absorption control system in use, because of the difference in number of people in the room.

LuXout Acoustical Draperies provide this flexible system. The draperies are available in any size, and utilize a "grommet pleating" heading with all the features of regular LuXout stage curtains. The draperies should be installed on a double-track system for best adjustability, but a single track or even a three-track system is available, utilizing the #1400 Studio Track and accessories.

The advantage of multi-track systems is that drapery panels can be placed wherever needed along the track run, and even "doubled-up", by placing one panel behind another, for maximum control. Or, they can all be moved out of the way for storage at the end of the track.

Draperies can be extended or stacked to produce desired sound effects quickly and without great effort. LuXout Acoustical Draperies assist in "tuning" a multi-purpose room to multi-function, and assist the instructor to strike a balance between conditions desired for a vocal group, with higher absorption and shorter reverberation, and an orchestra, with less absorption and longer reverberation.

(*by "tuning" we refer to adjusting the reverberations within the room to the number of people in the room and the desired reverberation rate.)

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