

Acoustics 2

Data:

Frequency:	63	125	250	500	1000	2000	4000	8000	Hz
dBA correction	-26	-16	-9	-3	0	+1	+1	-1	dBA

- 1 An office 4m wide by 5m long by 2.8m high has a carpeted floor, plaster walls containing in one case a 3m² window and a suspended ceiling with acoustic tiles. Calculate the reverberation time at the three octave frequencies for which absorption coefficients are listed.

Absorption coefficients			
Frequency	125	500	2kHz
Carpet	0.1	0.5	0.6
Plaster	0.03	0.04	0.44
Glass	0.3	0.1	0.07
Acoustic tiles	0.35	0.4	0.8

0.79sec, 0.44sec, 0.28 sec

- 2 A rectangular auditorium with a floor area of 30m² is required for speech use. The preferred reverberation time is 1 second. If we assume that a) the people will effectively occupy all the floor area and that they have an absorption coefficient of 0.9, and b) acoustic absorption by the walls and ceiling can be ignored, what is the optimum ceiling height.

5.63m

- 3 Using the mass law figure provided, how thick should a concrete floor slab be in order to provide a Sound Reduction Index of 51 dB. The density of concrete is assumed to be 2170 kg/m³.

230mm

- 4 If it is necessary to drill a hole in a massive wall of area 8m² but the resulting transmission loss of the wall must not be less than 35dB, what size can the hole be if it is square.

50x50mm