



Speech Privacy

Noise, particularly that made by other humans, ranks as the number one distraction in the workplace. According to recent studies, 74 percent of workers say noise distractions are frequent and impair their ability to get work done. In general, speech is more disturbing than sounds coming from machines because humans are naturally attuned to man-made sounds. The popularity of open offices has exacerbated the problem. In a study by the University of California's Center for the Built Environment, workers in enclosed offices are happier and less likely to take sick days than those that work in open spaces.

STC

Sound Transmission Class (STC) values are commonly used in the building industry to measure how much sound a material will block. The STC values roughly indicate the number of decibels that a material will block within a given range of frequencies. The higher the STC rating, the higher the sound attenuation properties of the system. At STC 30, normal speech is audible but unintelligible; at 35 loud speech is audible but unintelligible; and at 42 loud speech is just a murmur.

Articulation Index

The Articulation Index was developed to provide a measure of the ability to understand words and sentences under various conditions. The ability to understand sentences, for example, can be equated to speech privacy. Computation of the Articulation Index considers many factors that influence the ability to understand spoken sentences that may not be familiar to the listener, including the level and frequency spectrum of the speaker's voice, and the level and frequency spectrum of the background sound surrounding the listener.

NIC

Noise Isolation Class (NIC) takes into account the entire system — not just through, but over, under and around. NIC incorporates three factors that affect articulation index within a closed room – (1) the attenuation of the common wall (transmission loss), (2) the area of the common wall and (3) the acoustical absorption in the room.

NIC is a better measure of acoustical performance than STC in a private office setting because it takes into account the entire system. However, often times the information required for accurate NIC ratings is not readily available in the design process. Therefore, STC is often used as a proxy with the understanding that in a typical field situation you should deduct 5- 8 points for NIC to achieve comparable privacy for solid dividing walls or 10 - 12 points for demountable glass office fronts with doors.

When specifying an NIC rating, a designer must also define how the specified NIC will be achieved. It begins with the STC of the basic wall construction and includes paths by which sound goes around a wall. Such paths may include: through air leaks in a wall, over a partial height wall (i.e., one that stops at the ceiling or penetrates the ceiling only slightly), flanking via HVAC ducts, structure borne noise, and other paths.

Procedures

American National Standards Institute (ANSI) S3.5, Methods for the Calculation of the Articulation Index, was used as the criterion for privacy. Transmission loss of a typical wall was based on an average of 22 STC tests of a typical wall consisting of one layer of 1/2 in. or 5/8 in. dry wall on each side of 3- 5/8 in. metal studs spaced 16 in. or 24 in. on center and containing acoustically absorbent material in the cavity. A speaking voice sound level from Table 8 of ANSI S3.5 was used as the sound source level. Articulation Index was calculated for a range of NIC and background levels in the receiving room. Background sound was the spectrum defined by the noted Noise Criteria (NC) curve. Both NIC and STC are given.

Table 1 Speech Privacy NIC

Degree of Privacy	Background NC Level				
	25	30	35	40	45
	NIC degree of privacy				
Confidential	39	34	29	24	20
Normal	34	29	24	19	-
Marginal	32	27	23	-	-

Table 2 Speech Privacy STC

Degree of Privacy	Background NC Level				
	25	30	35	40	45
	STC degree of privacy				
Confidential	47	42	37	32	28
Normal	42	37	32	27	-
Marginal	40	35	31	-	-



STC RATINGS

ALUR GLASS WALL	GLASS THICKNESS	AIR SPACE	STC VALUE
MONOLITHIC GLASS	1/2" Monolithic	N/A	36
LAMINATED GLASS	1/2" w/PVB Interlayer	N/A	38
	1/2" w/Sound Control PVB Interlayer	N/A	39
DUO GLASS WALL (SINGLE PANE)			
MONOLITHIC GLASS	3/8" Monolithic	N/A	34
LAMINATED GLASS	3/8" w/PVB Interlayer	N/A	36
	3/8" w/Sound Control PVB Interlayer	N/A	38
DUO GLASS WALL (DOUBLE PANE)			
MONOLITHIC GLASS	3/8" Monolithic + 3/8" Monolithic	2"	42
LAMINATED GLASS	3/8" PVB Interlayer + 3/8" Monolithic Glass	2"	45
	3/8" PVB Interlayer + 3/8" PVB Interlayer	2"	46
	3/8" Sound Control PVB Interlayer + 3/8" Monolithic Glass	2"	48
	3/8" Sound Control PVB Interlayer + 3/8" Sound Control PVB Interlayer	2"	52

NIC RATINGS

ALUR GLASS WALL	DESCRIPTION	NIC VALUE
MONOLITHIC GLASS	Single Glazed Office Front with Hinged Door/Posts	29
	Single Glazed Office Front with Pivot Door/Postless & Post	27
	Single Glazed Office Front with Sliding Door/Posts	26
	Single Glazed Office Front with Sliding Door/Postless	25
DUO GLASS WALL		
MONOLITHIC GLASS	Double Glazed Office Front with Pivot Door	31
	Double Glazed Office Front with Sliding Door	29