GEONOISE ASIA CO., LTD.
6/54-56 Thanon Poemsin Soi 42, O-Ngoen,
Sai Mai 10220 Bangkok
Thailand
(+66) 021214399
inquiries@geonoise.asia
www.geonoise.com

Acoustics Glossary

No.	Terminology	Description	Standard
1.	Sound Absorption (α)	Sound energy is 'absorbed', to some extent, by the different media that sound waves encounter, along their transmission path, from the source to the receiver. The formulation of Sabine $\alpha = \frac{E_a}{E_i}$ E_a= Energy absorbed E_i = Energy of sound wave propagation	ISO 354-2003 ISO 3744:2010
2.	A-*Weighted* SPL	Correction of SPL measurement results to get the value of sound perception by the human ear. There are several weights, namely A, B, C, D and Z	ISO 3741:2010
3.	*Background Noise Level*	Sounds that are not from the main sound or unwanted sound	ANSI/ASA S12.60-2010
4.	*Clarity* (C_{50})	The ratio between the incoming sound at the receiver's position at first 50 ms to the time after 50 ms $C_{50} = 10 \log_{10}\left(\frac{\int_0^{0,05} P^2(t)dt}{\int_{0,05}^{\infty} P^2(t)dt}\right)$ P(t): the pressure of the response impulse in the room t: time	ISO 3382-2:2008/Cor 1:2009
5.	*Definition* (D_{50})	The ratio between the sound energy between 0 to 50 ms with the total energy received. $D_{50} = \frac{E_{50}}{E\infty} = \left(\frac{\int_0^{0,05} P^2(t)dt}{\int_{0,05}^{\infty} P^2(t)dt}\right)$ The minimum syllable clarity is 85%.	ISO 3382-2:2008/Cor 1:2009
6.	*Early Decay Time* (EDT)	The time required for initial decay is 10 dB on the echogram curve which is the extrapolated to 60 dB	ISO 3382-2:2008/Cor 1:2009

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	Flanking Sound	Sound transmission from a source room to the receiving room through fields other than a separate partition. In practice, flanking noise is always present.	ISO 15186-2:2003
7.	*Impulse response*	Interaction between sound sources and the surface of the room displayed in the time sequence pattern of sound reflection, and reduction of sound energy at any time or any reflected sound information.	ISO 3382-2019 part 1
8.	*Impact Sound Pressure Level* (Li)	The average sound pressure level in the receiver room during impact noise testing. The average sound pressure level in a particular frequency band in the receiving room when the floor being tested with an impact sound source that complies with the standard.	IEC 801-31-41
9.	*Noise Criterion* (NC)	A standard that describes the relative loudness of an indoor room with a frequency range from 63-8000 Hz. The method used is based on measurements from the SPL.	ANSI S3.4 American National Standard Procedure for the Computation of Loudness of Noise
10.	*Noise Isolation Class* (NIC)	Calculated from noise reduction by comparing measurement data with reference using STC criteria calculation in two rooms.	ASTM E336 and ASTM E413
11.	*Noise Rating Curve* (NR)	To explain acceptable noise in an indoor environment for hearing and communication. NR is plotted with SPL at different frequencies, from 31.5 to 8000 Hz.	ISO 1973
12.	*Normalized Impact Sound Pressure Level* (Ln dan L'n)	The level of impact sound is normalized in the standard absorption area in the receiver room. $L_n = L_i + 10\log(A/A_0)$ A= Sound absorption area A_0= Reference absorbtion area	Lab: ISO 140/VI-1978 Field: ISO 140/VII-1978
13.	*Normalized Level Difference* (DN)	A quantity that used to measure differences in different compilation spaces to measure sound levels $D_n = D - 10\log(A/A_0)$ D= Level difference (dB) A= Sound absorption area A_0= reference absoption area	ISO 16283 (parts 1-3)

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14.	*Preferred Noise Criterion* (PNC)	A noise measurement system for continuous or ambient noise in indoor environments proposed by Leo Beranek in 1971. Generally, PNC is used to justify a background source of noise from an acceptable ventilation. PNC is a modified form of NC because it can be used at low frequencies.	ANSI S12.2-1995
15.	*Reverberation time* (T_{60}, T_{30}, T_{20})	The time it takes for a sound energy to decay up to one thousandth of its initial energy or sound pressure decays up to one thousandth of its initial sound pressure, which is 60dB Sabine: $T_{60} = 0{,}161\frac{V}{S\alpha}$ Norris- Errying $$T_{60} = -0{,}161\frac{V}{Sln(1-\alpha)}$$ V: Volume of space S: Surface area of space α: absorption coeffecient	ISO 3382-1:2009
16.	*Scattering*	Uneven surfaces that can cause reflected waves are not in accordance with the reflection equation.	ISO 17497-1
17.	- *Sound Pressure Level* (SPL) - *Sound Intensity Level* (SIL) - *Sound Power Level* (SWL)	SPL: The difference between the pressure caused by a sound wave and the ambient pressure of the media the sound wave is passing through, expressed in logarithms $$SPL\ (dB) = 20\log_{10}\left(\frac{P_{actual}}{P_{ref}}\right)$$ SIL: logarithm of the ratio of a given intensity of sound in a stated direction to the reference sound intensity. Such intensity level in decibels is ten times the logarithm to the base ten of the ratio and is also known as the sound energy flux density level. $$SIL(dB) = 10\log_{10}(\frac{I}{I_0})$$ $I_0 = 10^{-12}$ W/m^2 SWL: The total acoustic power radiated by a source, in all directions and measured in watts (W). $$SWL = 10\log\left(\frac{W}{W_0}\right)$$	ISO 3741:2010

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		$W_0 = 10^{-12}$ W	
18.	*Sound Reduction Index* (R)	Measurement of the sound insulation properties of materials or building elements in the frequency band. $R = 10\log(W_1/W_2)$ W_1: sound power incident on the element under test W_2: sound power at the other side For measurements using sound pressure, R, calculated by $R = L_1 - L_2 + 10\log(S/A)$ L_1: average sound pressure level in the source space L_2: sound pressure level in the receiver room S: Testing Area A: The sound absorption area of the receiving room	ISO 10140-2010
19.	*Sound Transmission Class* (STC)	Quantity that measures how well the building partition weakens the sound in the air and shows the performance of the acoustic insulation of the building blocks of the room. STC does not work at low frequencies. STC is used as a method for comparing different partitions of ceiling, floor, door and window walls. STC is calculated based on the value of the TL tested at frequencies from 125 to 4000 Hz and plotted on the graph. On the STC graph, each curve must not have a difference of more than 8 dB and the sum of all the differences between the curves must not be more than 32 dB.	ASTM International Classification E413 and E90
	Spectrum Adaption Terms (Ctr)	Standardized values on the reference curve on the weighting value of airborne sound insulation. Ctr is used in the spectrum for urban traffic noise.	ISO 717-1-2013
20.	*Speech Transmission Index* (STI)	Acoustic parameters that describe how the quality of sound transmission in a room. This parameter has a range from 0 to 1. The closer to 1 the better	BS EN 60268-16:2011

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		$STI = \frac{\sqrt{\left(\frac{S}{N}\right)_{app} + 15}}{30}$	
21.	*Sound Transmission Loss* (STL)	A quantity that calculates the difference in sound level (dB) between one side to another $\Delta L_{TL} = -10 \log \tau$ $\overline{L_r} = \overline{L_s} - \Delta L_{TL} = 10 \log \left(\frac{S_w}{R_r}\right)$ $\overline{L_r}$= SPL in the receiver room (dB) $\overline{L_s}$= SPL in the source room (dB) τ = The fraction is transmitted to the receiving room through the wall ΔL_{TL}= *Transmission loss* in *reverberant field* S_w= Transmission surface area (m^2) R_r= receiving room constanta (m^2) Sound lavel is calculated at a distance of $r \geq 0{,}63\sqrt{R}$ from the source and 1 m from highly reflective surface	Lab: ASTM E90 Field: ASTM E336 dan ISO 140/IV
22.	*Standardized Level Difference* (DnT)	Sound levels difference between a pair of room, in frequency band and standardized to reference of reverberation time is 0.5s $DnT = D + \log(T/T_0)$ D= level difference T= RT in the receiver room T_0= RT reference 0,5s DnT calculated the transmission path between spaces and provides a direct correlation with subjective impression of airborne sound insolation.	Between two rooms: ISO 140/IV-1978 facade: ISO 140/V-1978
23.	*Standardized Impact Sound Pressure Level* (LnT dan L'nT)	Standardized Impact Sound Pressure Level (Li) values for Reverberation Time reference of 0.5s. $LnT(dB) = Li - 10\log(T/T_0)$ T: Reverberation Time measurement (s) T_0 = 0,5 s	ASTM E 989 – 89

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24.	*Weighted Level Difference* (Dw)	A value representing the ratio between the spectrum measured with the standard at ISO 717 for airborne and impact insulation. Dw is usually used to characterize insulation between spaces in a building	BS EN ISO 717-1:2013
25.	*Weighted Normalized Impact Sound Pressure Level* (Ln,w)	Lab measurements to determine the sound performance of buildings in the floor area	ISO 140/VIII ISO 717-2:2013
26.	*Weighted Sound Reduction Index* (Rw dan R'w)	Has similar meaning to STC but has a wider frequency range.	ISO 140/III
27.	*Weighted Standardized Level Difference* (DnT,w)	The amount used to characterize airborne sound insulation between spaces in a building. The measurement result is the total transmission between rooms, not only partitions so it will involve flanking sound.	ASTM E-336-05 ISO 717-1:2013
29.	*Weighted Standardized Impact Sound Pressure Level* (LnT,w dan L'nT,w)	A quantity is used to characterized impact sound insolation in the floor based on LnT or L'nT measurement.	ASTM E 1007 – 04 ISO 717-2:2013
30.	*Weighted Standardized Level Difference with Spectrum Adaption Term* (DnT,w+ctr)	A quantity to characterized airborne sound insolation between space with *spectrum adaption term*	ASTM E-336-05 ISO 717-1:2013

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31.	%ALcons	Presentation of consonants lost during the conversation process caused by a reduction in the value that occurs during the sound wave transmission process. $$\%ALcons = \frac{200r^2T_{60}^2(1+n)}{V\ Q\ M}$$ The value of% ALcons is very related to STI, that is, if the value of% ALcons is 3%, then it indicates that STI is very good with a value of 0.75 to 1. If% ALcons is 100-33%, then it indicates that STI is very bad, namely 0 to 0.3	BS EN 60268-16-2011 ISO/TR 4870:1991

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