GUSTAFS
DESIGNED FOR EYES AND EARS

ALPHABETIC ACOUSTIC GLOSSARY

Absorption Class
Classification of sound absorbers into Sound Absorption Classes A-E, according to EN ISO 11654, including frequencies 200-5000 Hz.

"Acoustics" is the term for the study of sound and how sound is experienced. The field of acoustics is divided into several specialist areas. The word acoustics comes from the Greek akoustikos ("to do with hearing") and akouo ("to hear").

Background noise (dB)
For example, speech, scraping chairs, humming ventilation, traffic, machinery and equipment, sound from corridors, adjoining rooms, playgrounds. Increased background noise can have long-term negative effects, such as illness, fatigue, decreased productivity and efficiency. Therefore it is not recommended to attempt to obtain better daily speech privacy by increasing the ventilation noise, or use other sound masking systems. Another thing to bear in mind is that people are differently sensitive to sound and noise in general. Privacy and seclusion in open plan spaces can only be solved satisfactory by creating separate rooms for confidential discussions and work tasks needing higher concentration.

Flutter echo
Occurs when noise bounces between parallel surfaces in a room.

Frequency
Stated in Hz (hertz). The higher the value, the lighter the tone (bass – treble). The frequency of speech lies primarily between 125 and 8000 Hz, while audible sound lies between 20 and 20 000 Hz. The frequency range which can normally be heard by humans lies between 20 and 20,000 Hz.

Noise
Unwanted sound. Noise can often be the individual perception of a particular sound.

Noise Reduction Coefficient (NRC)
Single value for sound absorption according to ASTM C 423, derived as the mean value of 4 frequencies in the range 250-2000 Hz.

Rapid Speech Transmission Index (RASTI)
RASTI is an objective way of measuring speech intelligibility. It is measured at two frequencies, 500 and 2000 Hz, by placing a loudspeaker, which transmits sound from the location of the person speaking, and a microphone where the listeners are situated. (See also STI).

Reverberation time, (T or RT)
The time it takes for the sound pressure level to fall by 60 dB after the sound has been turned off. Measuring the reverberation time allows us to calculate the total sound absorption. The reverberation time varies according to the frequency.

Sabine
The physicist Wallace Clement Sabine (1869-1919) created in Riverbank, west of Chicago, the well known Sabine formula (T=0,16V/A), showing the relationship between reverberation time (T s), room volume (V m^3) and the amount of absorption (A m^2).

Signal to noise ratio (S/N)
Another important parameter influencing speech intelligibility is the background noise level or, more specifically, the signal to noise ratio (S/N). This is the ratio between signal (e.g. speech) and background noise (e.g. ventilation noise). To achieve good speech intelligibility a signal is considered to be at least 15 dB above noise level. For hearing- impaired people the need is even greater; a ratio of at least 20 dB is often referred to.
On the other hand, if the signal to noise ratio is much less, or if the signal is lower than the noise, the signal will be partly masked. Thus some privacy can be achieved.

Sound absorbers
Materials and structures with the ability to take up sound energy and convert it into other forms of energy. They improve room acoustics by removing sound reflections, thus reducing the noise and the reverberation time.

Sound absorption
Means that sound energy is converted into mechanical vibration energy and/or heat energy. Sound absorption is expressed as the sound absorption coefficient α or the sound absorption class (A-E) according to EN ISO 11654 or NRC/SAA according to ASTM C 423.

Sound Absorption Average (SAA)
Single value for the sound absorption according to ASTM C 423, including the third octaves in the frequency range 200-2500 Hz.

Sound Absorption Class
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Sound insulation
The ability of a building element or building structure to reduce the sound transmission through it. The sound insulation is measured at different frequencies, normally 100-3150 Hz. Airborne sound insulation is expressed by a single value, Dn,f,w, Rw or R'w. Impact sound insulation is expressed by a single value Ln,w or L'n,w.

Sound pressure level (dB)
The pressure variations caused by sound waves in air are called sound pressure. The lowest sound pressure level which can be heard is 0 dB, known as the hearing threshold. The highest level which can be tolerated is called the pain threshold and is around 120 dB.

Sound strength (dB)
Measured in dB (deciBel). dB is measured at different frequencies.
dB(A) (or LpA) is a single-figure value used to describe the total sound strength for all frequencies in a way similar to the sensitivity of the ear.
dB(C) (or LpC) particularly focuses on low frequencies and better reflects how a sound is perceived by people with impaired hearing.

Speech intelligibility
Speech intelligibility is directly dependent on the level of background noise, reverberation time and the shape of the room. Different methods are used to evaluate speech intelligibility, the most common ones are RASTI, STI and %-Alcons.

Speech Transmission Index (STI)
Similar to the RASTI method but a more complete form of measuring speech intelligibility by measuring all octave bands in the frequency range 125-8000 Hz.