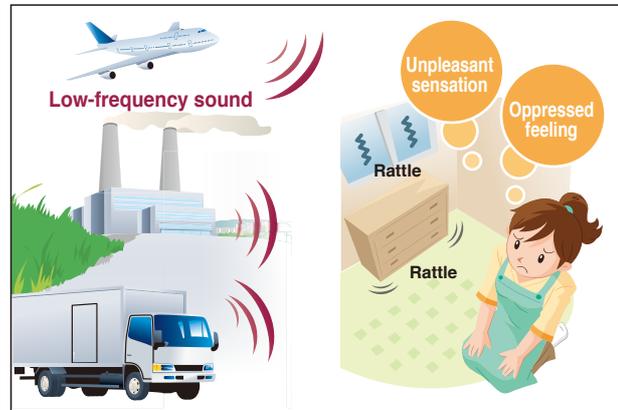


About low-frequency sound

What is low-frequency sound?

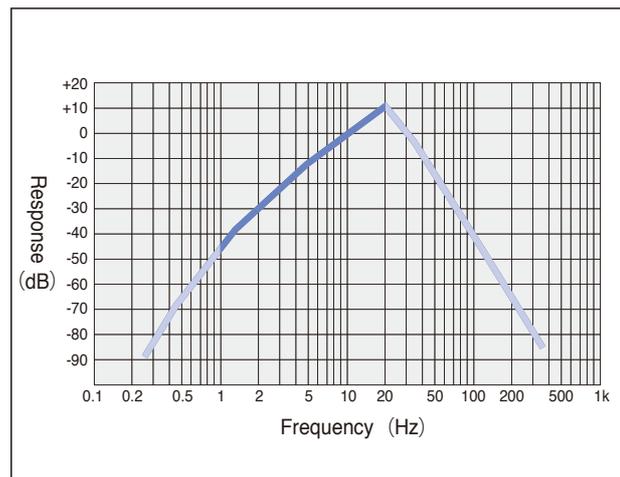
Low-frequency sound is usually taken to refer to acoustic energy in the frequency range from 1 to about 100 Hz. Within this category, the range from 1 to 20 Hz which is below the threshold of human hearing is called infrasound. The NL-62 is a sound level meter that covers not only the range of audible noise but also allows measurement of the entire low-frequency sound range. Commonly, noise as perceived by the ear is described using terms that refer to sensory perception, such as "loud" or "shrill". By contrast, low-frequency sound which often can hardly be perceived by ear is often described in psychological terms such as "oppressive" or "unpleasant". Generally, humans can recognize the presence of low-frequency sounds when their level exceeds 90 dB at 10 Hz or 80 dB at 20 Hz. At higher levels, the above mentioned psychological effects can occur and lead to complaints.



Example for low frequency sound waves causing rattle

What is G-weighting?

To evaluate the psychological and physiological effects of infrasound in the range from 1 to 20 Hz, the G-weighting curve was established as the ISO 7196 standard in March 1995. The curve is referenced to 10 Hz and uses the threshold values for human perception of infrasound. The principle is the same as that for A-weighting used in sound level meters, which uses 1 kHz as reference and simulates the characteristics of human hearing in the audible range. As can be seen from the illustration at right, the curve has a 12 dB/octave slope from 1 Hz to 20 Hz, with the 0 dB point being located at 10 Hz. Outside this range, at less than 1 Hz and more than 20 Hz, the attenuation is 24 dB per octave. Generally, when the G-weighting sound pressure level rises above 90 dB, it will register as low-frequency sound, which at higher levels has the potential for causing physiological phenomena (such as affecting sleep, breathing, or blood pressure), although studies have shown that there are considerable individual differences.



G-weighting

Why is frequency analysis necessary?

When low-frequency sound of a high intensity is present, it can directly affect the human body and cause unpleasantness, but there are also indirect influences. For example, window panes and other fixtures or furniture may rattle, which can be annoying. In fact, there is a close relationship between the low-frequency sound frequency components and the rattling phenomenon. By checking the sound pressure level of the various frequency components, one can determine whether there is a correlation between the perceived feeling of pressure and vibrations, the rattling phenomenon, and the low frequency sound. The NL-62 can make measurements both for the regular noise frequency range and for the low-frequency sound range, and it can also perform 1/3 octave band analysis (option).



1/3 octave band analysis screen