

What is noise?

Noise includes sound waves, infrasound, ultrasound, oscillations, and vibrations.

Sounds are part of our everyday lives. It is mostly pleasant (e.g. music, bird chirping) and essential (e.g. language, risk recognition).

Noise, however, refers to unwelcome, irritating, or harmful sound levels. Noise does not have to be loud in order to disturb: Creaky floors, squealing noises of electronic gadgets, the neighbor's clattering, a dripping water faucet can all be disturbing just like jackhammers and chain saws.

Noise is subjective: What is music to the ears of a rock musician is torture to a classics fan. According to DIN 1320 of the German Standards Association, for example, noise is defined as sound within the frequency range of human hearing that disrupts silence or a desired sound event, or results in nuisance and impaired health. Noise is not only heard with ears, but also perceived and processed by the body and mind.



Sound Vibrations Humming



Sound - Vibration - Humming

Audible and Inaudible Noise

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What does building biology have to offer?

Building biology consultants of the BUILDING BIOLOGY ASSOCIATION (VB) are experts in identifying and reducing environmental risks in indoor environments.

They measure, analyze, and assess sound levels in addition to many other factors, including mold, indoor toxins, electromagnetic pollution, radioactivity, air quality, and indoor climate. They also give recommendations for remediations.

Building biology consultants help find and reduce disease-causing factors that often hide within our own four walls.

We are less interested in discussing or arguing about unreasonable exposure limits than in taking positive action.

Life is more satisfying when there are less stressors-as a precaution and to be on the safe side.

Your Building Biology Consultant
Member of the Building Biology Association e.V. (VB)

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The Building Biology Association (VB) follows the Standard of Building Biology Testing Methods SBM and works in cooperation with the Institute of Building Biology and Ecology IBN/Neubeuern (<http://www.baubiologie.de/site/english.php>). Comprehensive information on building biology can be found in Wolfgang Maes' book "Stress durch Strom und Strahlung" (German ISBN 3-923531-25-7).



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VERBAND BAUBIOLOGIE (VB)
Building Biology Association

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Where does noise come from?

A very high proportion of the total noise exposure is the result of human activities such as car driving, airplane operation, train riding, industrial noise, leisure activity noise,

chain saws, lawn mowing, leaf blowing, and neighbors (including yourself).

But technical installations in apartments and residences also cause noise, including e.g. refrigerators, transformers in electronic devices, exhaust fans, ventilation systems, air-conditioning systems, radios, and TVs.

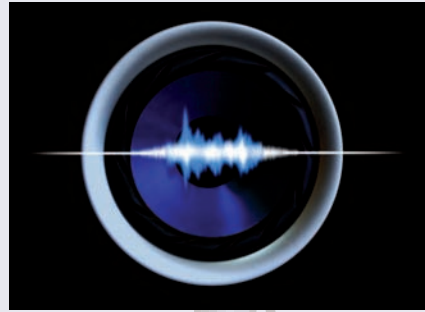
How do humans hear?

Ideally, a healthy person can hear frequencies from about 20 Hz to 20,000 Hz, at an advanced age more like 50 Hz to 10,000 Hz. Some people can hear more, some less. The noise which is “inaudible” to humans is called infrasound (frequencies below what a human ear can hear, i.e. below 20 Hz) or ultrasound (frequencies above what a human ear can hear, i.e. above 20,000 Hz).

What are infrasound and ultrasound?

These are the portions of the sound spectrum that are “inaudible” because they range above and below the frequencies which the human ear is able to detect. Infrasound and ultrasound can only be perceived as noise levels when at extremely high sound pressure levels of 100 dB and up. If it is infrasound, it is perceived as a kind of “hum in the belly,” a vibrating buzz, a sensation of being “under pressure.” If it is ultrasound, the sensations rather sound like hissing, whistling, or ringing, which should not be confused with tinnitus (sounds that are generated inside the ear). Often these scary sounds can only be detected by a person who is particularly sensitive to them and

possesses an individual resonance with the sound source; a less sensitive friend or spouse does not notice anything and, therefore, shows a disappointing lack of understanding.



How is sound measured?

The common measuring unit for sound is decibel as in dB(A). 0 dB cannot be detected acoustically, above 60 dB sound is perceived as loud, above 90 dB as unbearable, above 110 dB as painful, and above 130 dB as earsplitting noise. When the

sound level increases by 10 dB, the perceived sound volume doubles. Today the disturbing effect of noise can only be evaluated with the methods of psychoacoustics because it allows simulating human hearing with computer calculations. In most cases, noise protection guidelines (e.g. ISO, DIN, OSHA) are unable to describe the effect noise has on humans and animals.

Is humming also considered a noise?

Latest research shows that humming sounds in the infrared range take a particularly heavy toll on the human (as well as the animal) hearing organ. Against these types of hums, building structures and noise control installations can provide very little sound insulation-if at all. This is particularly devastating since many technical devices produce low sounds (e.g. heat pump, chest freezer, sump pump, diesel motor, elevators... steel concrete bridges, mobile phone base stations), which usually are completely underestimated by measurements.

What causes vibrations?

Infrasound and vibrations are closely linked; one can be the result of the other. When noises are conducted across sound bridges in building structures in such an unfortunate way that the latter go into resonance, the resulting vibrations can be perceived as much worse two floors down than directly next to the sound source. Infrasound and mechanical oscillations can cause nerve-racking vibrations.

Does noise impact human health?

Noise causes a wide range of effects in the autonomic nervous system. In many people, humming may trigger fear, anxiety, and tension. Some people are extremely sensitive to the vibrations of their environment, becoming nervous, anxious, and sick. The following conditions can all be the result of noise exposure: stomach and intestinal ulcers, cardiovascular disorders, autonomic nervous system and neurological disorders, sleep and concentration problems, stress symptoms and high blood pressure, ringing ears and deafness, headaches and nausea, depression and behavioral problems, blood vessel constriction and digestive problems.

What can I do about it?

The capacity to hear is always active, even during deep sleep. In contrast to our eyes that can-at least at night-find rest. Noise adaptation is deceptive. Not just the ears but also the entire body is exposed to noise day and night. It can harm us even if we are convinced that we are tolerating it quite well. Traffic noise shows severe effects, especially in children. Too much noise diminishes the ability to learn and perform (in classrooms as well).

How can I minimize health effects?

Avoid noise wherever and whenever possible-especially in sleeping areas. In noisy workplaces, employers must be asked to provide a low-noise environment or appropriate hearing protection must be used.

You should also do your part in reducing noise levels! Simply do not purchase noisy products. Check your own lifestyle as to whether you slam entrance and car doors, leave radios and TV sets blaring loudly, have the dog bark endlessly, or take the car for each single errand. Other people may have to relax, sleep, or focus on their work while you run your day.

