

INFORMATION CARD

NOISE



Sound is a longitudinal wave produced by alternating compressions and retractions of an elastic media such as water or air. A loud, unpleasant sound is called noise.

Speed of sound

$v = d/\Delta t$ [m/s] (d : distance from the source; Δt : time interval)

air: $v = 343$ m/s; water: $v = 1482$ m/s; rubber: $v = 54$ m/s

Intensity of sound:

Energy in a certain time interval (power P) per surface area of 1 m^2 [W/m^2]

Range of human acoustic threshold: 20 Hz to 20,000 Hz

0 dB: audible level

120 dB: pain threshold (source World Health Organization)

180 dB: not tolerable sound

Wave propagation in an open field

$$I_1/I_2 = d_2^2/d_1^2$$

(I : Intensity, d : distance to source)

Level of acoustic pressure L [dB]

$$L = 10 \log I + 120$$

Level of acoustic pressure L [dB] for n sources

$$L = 10 \log n + 10 \log I + 120$$

	I [W/m^2]	L [dB]
conversation	$3.2 \cdot 10^{-6}$	65
busy restaurant or traffic	$3.2 \cdot 10^{-5}$	75
shout	$3.2 \cdot 10^{-4}$	85
disco	$1.0 \cdot 10^{-2}$	100
concert	1.0	120

REMEMBER!!!! Noise exposure can affect physical (sleep disturbance, hearing impairment) psychological (somatic and behavioural effect) and cognitive areas.

If you want to measure noise levels with your smartphone check iStage 2.