Audio Engiennering lectures - lexicon

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Symbol	**Designation**	**Unit**
$P_{tot}(\vec{r}, t)$	total instantaneous pressure at position $\vec{r}$ and time t	Pa
P_0, P_s	static (atmospheric) pressure	Pa
$p(\vec{r}, t)$	instantaneous acoustic pressure at position $\vec{r}$ and time t	Pa
$\tilde{p}(\vec{r})$ or $p_{rms}(\vec{r})$	root mean square acoustic pressure at position $\vec{r}$	Pa
p_0	rms sound pressure at the hearing threshold at 1kHz	Pa
$\vec{v}(\vec{r}, t)$	particle velocity	m.s^{-1}
$\vec{\xi}(\vec{r}, t)$	displacement (/elongation) at position $\vec{r}$ and time t	m
$\vec{q}(\vec{r}, t)$	(volume) flow velocity at position $\vec{r}$ and time t	m^3.s^{-1}
$\vec{I}(\vec{r}, t)$	acoustic intensity	W.m^{-2}
W or Pa	acoustic power	W
$w(\vec{r}, t)$	volumic energy density	J.m^{-3}
$\vec{F}_p$	pressure force	N
L_p	sound pressure level	dB (re. 20 μPa)
L_I	sound intensity level	dB (re. 10^{-12} W.m^{-2})
L_W or L_{Pa}	sound power level	dB (re. 10^{-12} W)
L_N	loudness level	phone
N	loudness	sone
HL	Hearing Level	dB (re. to hearing threshold)
d	position on the Cochlea mapping a given frequency	Bark
$HRTF$	Head-Related Transfer Function	
L_{day}	Daytime average sound level	dB (re. 20 μPa)
$L_{evening}$	Evening average sound level	dB (re. 20 μPa)
L_{night}	Night-time average sound level	dB (re. 20 μPa)
L_{den}	"Day-Evening-Night" average sound level	dB (re. 20 μPa)
K	correction factor	dB (re. 20 μPa)
L_A	A-weighted sound pressure level	dB(A)
L_{eq}	equivalent level	dB (re. 20 μPa)
L_{em}	mean energetic level	dB (re. 20 μPa)
$\tilde{p}_A$	A-weighted sound pressure	Pa
$E_{A,T}$	noise dose during period T	Pa^2.s
c or c_0	sound celerity	m.s^{-1}
ρ or ρ_0	mass density of the medium	kg.m^{-3}
Z_c	characteristic impedance of the medium	Pa.s.m^{-1}
Z_{ac}	characteristic **acoustic** impedance of the medium	Pa.s.m^{-3}
Z	specific impedance ($\equiv \frac{p}{v}$)	Pa.s.m^{-1}
R_s	specific resistance	Pa.s.m^{-1}
X_s	specific reactance	Pa.s.m^{-1}
Z_a	acoustic impedance ($\equiv \frac{p}{q}$)	Pa.s.m^{-3}
R_a	acoustic resistance	Pa.s.m^{-3}

C_a	acoustic compliance	$m^5.N^{-1}$
M_a	acoustic mass	$kg.m^{-4}$
Z_m	mechanical impedance ($\equiv \frac{F}{v}$)	$N.s.m^{-1}$
R_m	mechanical resistance	$N.s.m^{-1}$
C_m	mechanical compliance	$m.N^{-1}$
M_m	mass	kg
z	normalized impedance ($\frac{Z}{Z_c}$)	-
β	normalized admittance ($\frac{Z_c}{Z}$)	-
R	reflection coefficient	-
α	absorption coefficient	-
T	period	s
f	frequency	Hz
ω	angular frequency / pulsation	$rad.s^{-1}$
λ	wavelength	m
k	wave number	$rad.m^{-1}$
f_n	eigenfrequency	Hz
ω_n	eigenpulsation	$rad.s^{-1}$
δ_n	damping ratio	-
MT_{60}	modal decay time	s
τ	dispersion of the first reflections	s
D	Definition index	-
C_{80}	Clarity index	-
T_s or T_{60}	Sabine reverberation time	s
T_{20}	Sabine reverberation time estimated on the first 20 dB drop	s
T_{30}	Sabine reverberation time estimated on the first 30 dB drop	s
α_s	Sabine absorption coefficient	-
A or A_s	equivalent sound absorption area	m^2
L_d	direct sound level	dB (re. 20 μPa)
L_r	reverberated sound level	dB (re. 20 μPa)
δ or Δ	directivity factor	-
d_c	critical distance	m
r_h	critical radius	m
$I_m(\vec{r})$	intensity of a monopole at distance $\vec{r}$	$W.m^{-2}$
$I_d(\vec{r},\theta)$	intensity of a dipole at distance $\vec{r}$ and angle θ	$W.m^{-2}$
$p_m(\vec{r})$	sound pressure radiated by a monopole at distance $\vec{r}$	Pa
$p_d(\vec{r},\theta)$	sound pressure radiated by a dipole at distance $\vec{r}$ and angle θ	Pa
$D(\theta)$	directivity (function of angle θ)	-
S_d	sound source area / cross-section	m^2
a	radius of a vibrating piston	m
P_{aS}	acoustic power of a sound source	W
Z_{ar}	acoustic radiation impedance	$Pa.s.m^{-3}$
R_{ar}	acoustic radiation resistance	$Pa.s.m^{-3}$
X_{ar}	acoustic radiation reactance	$Pa.s.m^{-3}$
M_{ar}	acoustic radiation mass	$kg.m^{-4}$
R_{mr}	mechanical radiation resistance	$N.s.m^{-1}$
X_{mr}	mechanical radiation reactance	$N.s.m^{-1}$
M_r	(mechanical) radiation mass	kg
M	microphone sensitivity	$V.Pa^{-1}$
L_M	microphone sensitivity in dB	dB (re. 1 $V.Pa^{-1}$)

Δ	directivity factor	-
L_Δ	directivity index	dB
U or E	voltage (E relates to the back-emf of a moving coil)	V
R_e	electrical resistance (eg. of a coil)	Ω
L_e	electrical inductance (eg. of a coil)	H
f_d	cut-off frequency of a piston in a screen	Hz
$B\ell$	force factor of an electrodynamic transducer	N.A^{-1}
L_s	equivalent inductance of a mechanical compliance (electrodynamic)	H
C_s	equivalent capacitance of a mechanical mass (electrodynamic)	F
R_s	equivalent resistance of a mechanical resistance (electrodynamic)	Ω
f_s	resonance frequency of a (mechanical) resonator	Hz
Q_e	electrical quality factor	-
Q_m	mechanical quality factor	-
Q_t	total quality factor	-
Z_{HP}	loudspeaker input electrical impedance	Ω