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American National Standard Letter Symbols and Abbreviations for Quantities Used in Acoustics

Sponsor

IEEE Standards Coordinating Committee 14 on Quantities, Units, and Letter Symbols

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Abstract: Letter symbols for physical quantities used in the science and technology of acoustics are covered. Abbreviations for a number of acoustical levels and related measures that are in common use are also given. The symbols given in this standard are intended for all applications.
Keywords: abbreviations, acoustical levels, acoustics, infrasound, letter symbols, physical quantities, sound, sound levels, symbols, ultrasound, units, vibration

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Introduction

(This introduction is not a part of ANSI/IEEE Std 260.4-1996, American National Standard Letter Symbols and Abbreviations for Quantities Used in Acoustics.)

This revision was prepared under the auspices of the IEEE Standards Coordinating Committee on Quantities, Units, and Letter Symbols (SCC14) by its Subcommittee on Acoustics (SCC14.5). At the time of approval of this standard, the membership of Subcommittee 14.5 was as follows:

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American National Standard Letter Symbols and Abbreviations for Quantities Used in Acoustics

1. Overview

This standard covers letter symbols[1] for physical quantities[2] used in the science and technology of acoustics; it also covers abbreviations for a number of acoustical levels and related measures that are in common use.

The science and technology of acoustics include sound, ultrasound, and infra-sound in all media: gases, especially air; liquids, especially water; and solids are examples of media with which acoustics is concerned. There are many specialties in acoustics, a few of which are speech, hearing, music, noise control, vibration, shock, and sonar.

The symbols given in this standard are intended for all applications, including use in text and equations; in graphs and diagrams; and on panels, labels, and nameplates.

"General principles of letter symbol standardization" common to SCC14 standards are given before the more specialized "principles applicable to letter symbols and abbreviations for quantities used in acoustics." These are followed by the "introduction to the tables" and a "bibliography."

2. References

This standard shall be used in conjunction with the following publication. When the following standard is superseded by an approved revision, the revision shall apply.

ANSI/IEEE Std 268-1992, American National Standard for Metric Practice.[3]

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[1]"Letter symbol" as a technical term does not have the same meaning as either "name" or "abbreviation." An abbreviation is a letter or a combination of letters (plus sometimes an apostrophe or a full stop, i.e., a period) that by convention represents a *word* or a *name* in a particular language; hence, an abbreviation may be different in a different language. A symbol represents a *physical quantity* or a *unit* and is therefore independent of language. Example: For electromotive force, the symbol is *E*, whereas the abbreviation is emf in English, fem in French, and EMK in German. The unit names "ampere" and "second" have sometimes been abbreviated amp and sec, respectively, but this usage is now deprecated. The standard unit symbols for ampere and second are A and s, respectively.

[2]As used in this standard, the term *physical quantity* means a measurable attribute of phenomena or matter. Examples are length, mass, and time.

3. General principles of letter symbol standardization

3.1 Letter symbols

Letter symbols include symbols for physical quantities (quantity symbols) and symbols for units in which these quantities are measured (unit symbols).

A quantity symbol is, in general,[4] a single letter (for example, *I* for electric current) specified as to style of type font (e.g., bold, italic) and modified when appropriate by one or more subscripts or superscripts. In a given work the same letter symbol should appear throughout for the same physical quantity, regardless of the units employed or of special values assigned.

A unit symbol[5] is a letter or group of letters (for example, mm for millimeter), or in a few cases a special sign, that may be used in place of the name of a unit.

3.2 Alphabets and typography

Letter symbols are mainly restricted to the English and Greek alphabets. Greek letters that are easily confused with English letters shall be avoided. The type families that are used for text in modern book and journal publishing all include italic (oblique) type faces and related roman (upright) faces. The former are used for quantity symbols, and the latter, for unit symbols. The distinctions are discussed more fully in the following paragraphs. (In the context of this standard, the term *roman* is used simply to mean upright in contrast with oblique and carries no connotation regarding serifs, line widths, or the like.) In situations where roman and italic fonts are not both available, care shall be taken to avoid confusion between quantities and units. For example, an underline is frequently used to indicate italic type, and where an underline can be provided, as in manual typewriting, this practice is often helpful.

Unconventional type faces should generally not be used for letter symbols. Script and Old English faces, for example, are not appropriate for unit symbols. Such special faces have seen limited use for quantity symbols, but good modern practice avoids them.

Symbols for physical quantities, mathematical variables, indexes, and general functions[6] are printed in italic type. For example:

A	area
e	elementary electric charge
x, y, z	Cartesian coordinates
i, j, k, n	indexes
$f(x)$	function of x

Symbols for units of measurement, mathematical constants, specific mathematical functions, operators, and numerals used as indexes are printed in roman type. For example:

cm	centimeter

[3]IEEE publications are available from the Institute of Electrical and Electronics Engineers, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA.

[4]Symbols composed of two letters are sometimes used for numerical transport parameters, such as *Re* for Reynolds number.

[5]Unit symbols have sometimes been treated in the same manner as general abbreviations, but the recommendations of the International Committee for Weights and Measures (CIPM), and of many other international and national bodies concerned with standardization, emphasize the symbolic character of these designations and rigidly prescribe the manner in which they shall be treated. This concept of the unit symbol is therefore adopted in this standard.

[6]The term *general functions* is here used to contrast with *specific mathematical functions*, for which roman type is to be used.

e	base of natural logarithms
sin x	sine of x
$\mathrm{J}_2(z)$, $\mathrm{J}_n(z)$	Bessel functions
d*x*	differential of *x*

Subscripts and superscripts are governed by the preceding principles. Those that are letter symbols for quantities or for indexes are printed in italic type, while all others are printed in roman type. For example:

C_p	heat capacity at constant pressure *p*
a_{ij}, a_{45}	matrix elements
I_i, I_o	input current, output current
x_av	average value of *x*

For indicating the vector character of a quantity, boldface italic type is used. For example:

F	force
H	magnetic field strength

Ordinary italic type is used to represent the magnitude of a vector quantity. It is also commonly used for a vector quantity when there is no need to draw attention to the vector character of the quantity.

When tensor quantities of second or higher order are to be represented by a single letter, sans serif type should be used (for example, ***A, B***).

3.3 Remarks concerning quantity symbols

Quantity symbols may be used in mathematical expressions in any way consistent with good mathematical usage. The product of two quantities *a*, *b*, is indicated by writing *ab.* The quotient may be indicated by writing

$$\frac{a}{b},\ a/b,\ \text{or}\ ab^{-1}$$

If more than one slash (/) is used in any algebraic term, parentheses shall be inserted to remove any ambiguity. Thus, one may write *(a/b)/c*, or *a/(b/c)*, but not *a/b/c*.

Subscripts and superscripts are widely used with quantity symbols. Several subscripts and superscripts, sometimes separated by commas, may be attached to a single letter. But, so far as logical clarity permits, subscripts and superscripts should not be attached to other subscripts and superscripts. A symbol that has been modified by a superscript should be enclosed in parentheses before an exponent is attached.

Conflicts that occur because different quantities are assigned identical symbols in the same or different standard symbol lists should be resolved in one of the following ways:

a) By use of a reserve symbol (alternative symbol) if one is listed
b) By use of a subscript or superscript selected by the author for one or more of the conflicting requirements
c) By use of uppercase letters as variants for lowercase letters and vice versa, but only if no ambiguity results

3.4 Remarks concerning unit symbols

A roman (upright) type font shall be used for unit symbols, even when the surrounding text is in an italic font. In general, unit symbols are lowercase letters, except for a very few that use special signs (such as ° for degree). If, however, the symbol is for a unit whose name is derived from a proper name, uppercase roman type is used for the first letter.[7]

As a further exception to the general rule, the symbol L is used for liter to avoid confusion between the lowercase letter l and the numeral 1. Some additional exceptions arise in the special cases where symbols are joined, as in eV, the symbol for electronvolt, and in mmHg, the symbol for conventional millimeter of mercury, a unit of pressure. The distinction between uppercase and lowercase letters shall be followed, even if the symbol appears in applications where the other lettering is uppercased. The form of unit symbols is the same for both singular and plural, and they are not followed by a period except at the end of a sentence.

In the complete expression for a quantity, a space should be left between the numerical value and the unit symbol. For example, write 35 mm, not 35mm, and 2.371 m, not 2.371m. When the quantity is used in an adjectival sense, a hyphen is often used in lieu of a space between the number and the unit name or between the number and the symbol.

Examples:

A 3-meter pole. . . . .The length is 3 meters.

A 35-mm film. . . . .The width is 35 mm.

EXCEPTION: No space is left between the numerical value and the symbols for degree, minute, and second of plane angle.

When a compound unit is formed by multiplication of two or more other units, its symbol consists of the symbols for the separate units joined by a raised dot (preferred) or separated by a space (for example, N·m or N m for newton meter). The dot may be omitted in the case of familiar compounds, such as watthour (symbol Wh), if confusion is unlikely. Hyphens should not be used in symbols for compound units. Positive and negative exponents may be used with the symbols for units.

When a compound unit is formed by division of one unit by another, its symbol is constructed in one of the following forms:

$\mathrm{m/s}$ or $\mathrm{m \cdot s^{-1}}$ or $\frac{\mathrm{m}}{\mathrm{s}}$

In simple cases use of the slash is preferred, but in no case should more than one slash, or a slash followed by a product, be used in the same expression

unless parentheses are inserted to avoid ambiguity. For example, write:

$\mathrm{J/(mol \cdot K)}$ or $\mathrm{J \cdot mol^{-1} \cdot K^{-1}}$ or $\mathrm{(J/mol)/K}$

but *not* J/mol/K or J/mol·K

In complicated cases, negative powers should be used.[8]

[7]Many units are derived from proper names. Examples include the ampere, for which the letter symbol is A, and the kelvin, for which the letter symbol is K. Prefixes are considered separately (see 3.5).

[8]The notation for products and quotients of unit symbols is intentionally made more explicit than that given in 3.3 for quantity symbols because some unit symbols are composed of more than one letter.

Letter symbols and mathematical notation should not be mixed with unit names in the same expression. For example, write joules per kilogram or J/kg. Do not write joules/kilogram or joules/kg or J/kilogram.

3.5 The International System of Units (SI)

In this standard, some units are identified as SI units. These units belong to the International System of Units (Système International d'Unités), which is the name given in 1960 by the General Conference on Weights and Measures (Conférence Générale des Poids et Mesures) to the coherent system of units built upon the base units in table A.

Table A—SI base units

Unit	Physical quantity
meter	length
kilogram	mass
second	time
ampere	electric current
kelvin	thermodynamic temperature
mole	amount of substance
candela	luminous intensity

This standard uses the spellings *meter*, *liter*, and *deka* in accordance with common US usage. The alternative spellings *metre*, *litre*, and *deca* may also be used.[9]

The prefixes in table B are used to indicate decimal multiples or submultiples of SI units.

Compound prefixes, formed by the juxtaposition of two or more SI prefixes, are not to be used. For example, use

nm, *not* mµm
pF, *not* µµF

For historical reasons, although the SI unit of mass is the kilogram (kg), the SI prefixes are attached to the gram (g). Thus, milligram (mg), *not* microkilogram (µkg).

If values are required outside the range covered by the prefixes, they should be expressed using powers of ten applied to the unit in question. Thus, 10^{-34} J.

An exponent attached to a symbol containing a prefix indicates that the multiple or submultiple of the unit (the unit with its prefix) is raised to the power expressed by the exponent. For example:

$$\mathrm{cm}^3 \quad \triangleq \quad (10^{-2}\ \mathrm{m})^3 \quad = 10^{-6}\ \mathrm{m}^3$$

[9]The spelling of some unit names varies from language to language. One of the principal advantages of unit symbols is that they are language invariant.

Table B—SI prefixes

Multiple	SI prefix	Symbol
10^{24}	yotta	Y
10^{21}	zetta	Z
10^{18}	exa	E
10^{15}	peta	P
10^{12}	tera	T
10^{9}	giga	G
10^{6}	mega	M
10^{3}	kilo	k
10^{2}	hecto	h
10	deka	da
10^{-1}	deci	d
10^{-2}	centi	c
10^{-3}	milli	m
10^{-6}	micro	µ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a
10^{-21}	zepto	z
10^{-24}	yocto	y

$$\mathrm{ns}^{-1} \quad \underline{\Delta} \quad (10^{-9}\ \mathrm{s})^{-1} = 10^{9}\ \mathrm{s}^{-1}$$
$$\mathrm{mm}^{2}/\mathrm{s} \quad \underline{\Delta} \quad (10^{-3}\ \mathrm{m})^{2}/\mathrm{s} = 10^{-6}\ \mathrm{m}^{2}/\mathrm{s}$$

where $\underline{\Delta}$ indicates equality by definition.

For further information concerning metric practice and the SI, refer to ANSI/IEEE Std 268-1992.[10]

3.6 Usage

The use of unit symbols in place of full names of the units is frequently desirable where space is restricted. Their use presupposes that the reader will find them intelligible. When an unfamiliar unit symbol is first used in text, it should be followed by its name in parentheses or the name should be given with the symbol in parentheses; the symbol may be used alone thereafter. Explanatory notes or keys should be included where appropriate on drawings and in tabular matter.

[10]Information about references can be found in clause 2.

Attachment of letters to a unit symbol as a means of giving information about the quantity under consideration is incorrect. Thus MWe for “megawatts electrical (power),” Vac for “volts ac,” and kJt for “kilojoules thermal (energy)” are not acceptable. For this reason, no attempt should be made to construct SI equivalents of the abbreviations “psia” and “psig,” so often used to distinguish between absolute and gage pressure. If the context leaves any doubt as to which is meant, the word pressure has to be qualified appropriately. For example:

“...at a gage pressure of 13 kPa” or
“...at an absolute pressure of 13 kPa”

When space limitations make it necessary to juxtapose information about the quantity being measured with the unit name or unit symbol, such information shall be separated from the unit symbol by a space, by a comma followed with a space, or the equivalent. Thus, the following examples are appropriate for use on nameplates, gage scale plates, table headings, graph labels, etc.:

rating—115 V ac
kPa, gage
kPa (abs)

On the other hand, letters may be attached to a unit symbol where needed to identify properly the unit involved. In such symbols as inHg, mmHg, and ftH_2O, the suffixes are needed to identify the units, which are units of pressure, not of length. Similarly, it is proper to write Btu_{IT}, cal_{th}, gal_{US}, etc., to distinguish from the related but different units Btu_{60}, cal_{15}, gal_{UK}, etc.

3.7 Unit symbols to be used with limited character sets

Refer to clauses 6.1 through 6.6 of ANSI/IEEE Std 260.1-1993 for a detailed discussion. Topic headings include: Character Set Lacks Greek Letters (6.1); Character Set Lacks Superscript Symbols (6.2); Character Set Lacks Superscript Numerals (6.3); Character Set Lacks Raised Dot (6.4); Character Set Limited to a Single Case (6.5); Examples of Symbols for Limited Character Sets (6.6).

4. Principles applicable to letter symbols and abbreviations for quantities used in acoustics

4.1 Time-varying quantities

When subscripts are used to denote various values associated with a time-varying quantity, the subscripts (for the values indicated) shall conform with the following list:

	Preferred	Reserve
instantaneous value	i	I
peak value	pk, k	PK
average value	av	AV
root-mean-square value	rms	RMS
maximum value	max, m	MAX, M
minimum (valley, nadir) value	min, n	MIN, N

When no subscript appears, the symbol is understood to represent the root-mean-square value. The subscript “eff” has been adopted for root-mean-square (rms) value by the IEC, but it is not recommended in this standard.

4.2 Average values

The average value of a quantity with respect to time may be indicated by a superscript bar, e.g., $\bar{p}$. Likewise, the spatial average may be indicated by enclosing the symbol in elbow brackets, e.g., <w>.

4.3 Quantities per unit volume, area, or length

It is recommended that quantities per unit volume, area, or length be represented, where practical, by lowercase letters corresponding to the uppercase letters that represent the total quantities, or by the uppercase letter with the subscript v, a, or l, except for those quantities for which this standard gives a specific symbol for the quantity per unit volume, area, or length.

4.4 Sequence for double subscripts to multiplying operators

The sequence of double subscripts to the multiplying coefficients (mutual impedances, resistances, transconductances, etc.) that occur in systems of equations is to be determined as follows. The first subscript in the symbol shall agree with the subscript of the quantity resulting from the multiplication, and the second subscript shall agree with that of the multiplicand.

Example:

$$V_1 = Z_{11}I_1 + Z_{12}I_2 + Z_{13}I_3$$

4.5 Remarks concerning levels

A level is treated like any other quantity and may be represented by a quantity symbol with a subscript, as listed in tables 8, 9, and 10. The name "level," by itself, is incomplete because there are many different kinds of levels, e.g., voltage level, power level, and A-weighted sound level. Moreover, the statement of the value of a level is incomplete unless the reference quantity is known to the reader. Levels in decibels are generally expressed as ten times the logarithm of a power or an energy ratio. For field quantities (such as voltage or force, for which the square is proportional to power or energy), levels in decibels are commonly expressed as twenty times the logarithm of a field quantity ratio. For quantities (such as impedance or admittance, which sometimes are proportional to an energy and other times to a field quantity), the use of "level" is deprecated.

4.5.1 Notation for expressing the reference of a level

A level representing a quantity x with a reference quantity x_{ref} may be indicated by:

$$L_x \text{ (re } x_{\text{ref}}) \text{ or } \qquad L_{x/x_{\text{ref}}}$$

Examples:

The statement that a certain sound pressure level in air is 15 dB above the level corresponding to a reference pressure of 20 μPa can be written as

$$L_p \text{ (re 20 μPa)} = 15 \text{ dB} \qquad \text{or} \qquad L_{p/20\ \mu\text{Pa}} = 15 \text{ dB}$$

The statement that the level of a current is 10 Np below 1 A can be written as

$$L_I \text{ (re 1 A)} = -10 \text{ Np}$$

The statement that a certain power level is 72 dB above 1 pW can be written as

L_W (re 1 pW) = 72 dB

in a situation where the reserve symbol L_W is needed to avoid confusion.

The statement that a certain electric field strength level is 50 dB above 1 μV/m can be written as

L_E (re 1 μV/m) = 50 dB

In presenting data, particularly in tabular form or in graphical symbols, a condensed notation is often needed for identifying the reference value. Then the following condensed form, illustrated by application to the above examples, may be used:

15 dB (20 μPa)
–10 Np (1 A)
72 dB (1 pW)
50 dB (1 μV/m)

Note that there is a space before the parentheses.

In the expression of a reference quantity, the “1” is sometimes omitted. This is not recommended because confusion may occur.

When a constant reference quantity is explained in the text and used repeatedly in a given context, the reference quantity need not be restated at each subsequent use.

4.5.2 Indication of the weighting of a level

Frequently in acoustics, a sound pressure level or a sound power level is said to be weighted according to the A, B, C, D, or other frequency weighting curve. These are commonly called weighted levels, but they properly should be called levels of weighted pressure or power. With any weighted level, the unit of measurement is unchanged. It is still the decibel, or bel, or neper. The practice of indicating weighting by attaching letters to dB, as in dBA or PNdB, has led to the incorrect belief that weighted levels are measured on a different scale, or by a frequency weighted decibel. *Such attachments are incorrect, and are strongly deprecated*.

The designation PNdB is deprecated for any use, whether to mean perceived noise level or a nonexistent perceived noise decibel.

The decibel itself is never weighted. The symbol dB is a unit symbol, and it is neither a quantity symbol nor an abbreviation for level.

Any qualification of a level should be indicated, not by attaching letters to the unit symbol dB or B or Np, but by attaching appropriate subscripts to the quantity symbol *L*, or by an appropriate abbreviation, as shown in tables 8, 9, and 10. An example is L_{AF} for fast, A-weighted sound level. In a limited context, where it has been made clear what kind of weighting is concerned, the symbol *L* may be used without a subscript.

4.5.3 Sequence of subscripts for a level

A succession of subscripts on *L*, the quantity symbol for a level, identifies the kind of level and the frequencywise and timewise modifications of it. For example, $L_{P\,\mathrm{A}}$ first of all represents the level of a power, for which the symbol is *P*; secondly, the A signifies that A-frequency weighting was applied.

In acoustics, the absence of a first subscript for the kind of level is an indication that the symbol *L* stands for a sound pressure level. The subscripts signify modifications of sound pressure level. For example, L_{AS} represents the level of A-frequency weighted, squared sound pressure followed by slow exponential time averaging.

As another example, L_{C8h} represents an 8-h average, C-weighted sound level; the C-frequency weighting was applied to the sound pressure signal; next, the sound pressure was squared; then the arithmetic mean of the squared sound pressures was taken during 8 h; finally, the level was obtained.

Sound level is understood to mean A-weighted sound pressure level if no frequency weighting is specified. Hence, in a context in which only sound level is involved, L represents (A-weighted) sound level, and L_{av8h} or simply L_{8h} represents an 8-h average sound level. The usual unit of all these levels is the decibel.

Maximum tone-corrected perceived noise level is a special frequency-weighted sound pressure level with nominally "slow" time averaging. The quantity symbol is L_{PNTmax}. The first two subscript letters PN signify the somewhat involved "perceived noise" frequency weighting; the subscript T signifies a further frequency weighting for prominent tonal components; after the slow exponential time average, another time weighting identified by max is applied by selection of the greatest tone-corrected perceived noise level that occurs during (for example) the flyover of an aircraft.

4.6 Remarks concerning abbreviations

An abbreviation is a shortened form of a word or phrase, used to represent the complete form. The shortened form is obtained by omission of some letters, even all of the letters of some words. The abbreviations recommended in this standard use capital letters.

4.6.1 Use of abbreviations

Abbreviations are to be used only where necessary to save space and time. The time saved by a writer who uses an abbreviation is often less than the time lost by each reader who has to find its meaning. An abbreviated term should be spelled out in full at its first appearance in text, followed by the abbreviation in parentheses. In addition, a glossary may be provided for the convenience of the reader.

Abbreviations for the names of quantities are used as nouns because the names they stand for are nouns or noun phrases. They may also be used as adjectives, as for example: "the day-night average sound level limit" may be abbreviated to "the DNL limit." As a further example, the statement, "The limit is 92 decibels, fast, A-weighted sound level at 15 meters" can be shortened to "The FA limit at 15 m is 92 dB."

Abbreviations should not immediately follow a unit symbol. For example, instead of "92 dB FA," use "FA: 92 dB."

4.6.2 International use

Abbreviations should be carefully considered, and perhaps especially avoided, in publications and drawings that are intended for circulation internationally because they are formed from words that often differ from one language to another. In this respect, abbreviations stand in contrast to letter symbols for quantities and units that are standardized internationally.

4.6.3 Mathematics

Abbreviations should not be used in mathematical formulations. Letter symbols should be used instead.

4.6.4 Sequence of letters in an abbreviation

The original sequence of letters in the words and of words in any phrase is to be maintained in an abbreviation. As an example, day-night average sound level is abbreviated to DNL; the single letter L in this context serves as the abbreviation for average sound level. LDN or Ldn is not a correct abbreviation for day-night average sound level because LDN or Ldn is not a shortened form of the full phrase.

In phrases and abbreviations in this standard for oscillating quantities, the averaging time is stated first, the limiting frequency band second, the kind of variable next, and, finally, the level. For example, 8HL is the abbreviation for 8-h average sound level; much of the abbreviation is feasible because sound level unmodified has the connotation of sound pressure level within the frequency band delimited by the A-frequency weighting. As a longer example of the sequence, slow octave-band sound pressure level centered on 125 Hz may be abbreviated to SOBSPL at 125 Hz.

4.6.5 Invariance of form

The form of an abbreviation shall be invariant. Syntactical endings shall not be used. For example, an “s” shall not be added to indicate plural.

4.6.6 Subscripts

Subscripts shall not be used in or with abbreviations.

4.6.7 Punctuation

Except as shown in abbreviations in this standard, punctuation marks shall not be used as part of an abbreviation. However, a period may be placed at the end of any abbreviation that spells an English word if the omission of such a period could result in confusion.

4.6.8 Additional abbreviations

For abbreviations of terms other than those in this standard, refer to ANSI Y10.1-1972 [B3].[11]

5. Introduction to the tables

Tables 1 through 10 list quantities, grouped in several categories, and give quantity symbols for each. In addition, tables 8 through 10 give standard abbreviations for the quantities listed. (Abbreviations are usually not appropriate for the quantities listed in tables 1 through 7.) Only abbreviations are given for some quantities that are not operated on mathematically and that therefore do not require letter symbols. To aid in identifying the quantities, their units based on the International System of Units (SI) and their standard unit symbols are included.

A quantity shall be represented by the standard symbol appearing in the tables, regardless of the units in which it is expressed. Those quantity symbols that are separated by a comma are alternatives on equal standing. A symbol enclosed in parentheses is a reserve symbol to be used only when there is a specific need to avoid a conflict.

Tables 1, 2, 3, and 5 contain quantities of interest in acoustics, many of whose symbols have already been standardized for broad fields of application. These have been copied from ANSI Y10.5-1968 [B4] and the same item numbers retained with conversion to all-numeric designation. For example, items 3.14.1, 3.14.2,

[11]The numbers in brackets preceded by the letter B correspond to those of the bibliography in clause 6.

3.14.3, and 3.14.4 were formerly 3.14a, 3.14b, 3.14c, and 3.14d. Those items of more recent interest in acoustics, including most of table 4, have been copied in part from the corresponding section of ISO 31: 1992 [B14]. Consequently, there are intentional gaps in the item numbers to make it easier to compare ANSI Y10.5-1968 [B4], ANSI Y10.11-1984, and ISO 31: 1992 [B14] with the present standard. A few items not in ANSI Y10.5-1968 [B4] have been added and given numbers.

Tables 6 through 10 contain quantities of interest primarily in acoustics and bear no particular relation to ANSI Y10.5-1968 [B4]. Table 6 has been compared to the section on acoustics of ISO 31: 1992 [B14] to reduce differences between them, but it does not necessarily eliminate these differences completely. The coverage in table 6 is the more extensive.

Quantity symbols and abbreviations are listed alphabetically in tables 11 and 12 for ready reference. Finally, all quantities, together with variants of their names, are listed in table 13.

6. Bibliography

[B1] ANSI S1.1-1994, American National Standard for Acoustical Terminology.

[B2] ANSI S3.14-1977 (Reaff 1986), American National Standard Rating Noise with Respect to Speech Interference.

[B3] ANSI Y10.1-1972 (Reaff 1988), American National Standard Glossary of Terms Concerning Letter Symbols.

[B4] ANSI Y10.5-1968, American National Standard Letter Symbols for Quantities Used in Electrical Science and Electrical Engineering.

[B5] ARI 275-1984, Application of Sound Rated Outdoor Unitary Equipment.

[B6] *ASHRAE Handbook: Fundamentals, SI Edition*, 1993.

[B7] IEC 27-3 (1989), Letter symbols to be used in electrical technology—Part 3: Logarithmic quantities and units.

[B8] IEC 50-801: 1994, International Electrotechnical Vocabulary—Chapter 801: Acoustics and electroacoustics.

[B9] IEEE Std 100-1992, The New IEEE Standard Dictionary of Electrical and Electronics Terms (ANSI).

[B10] IEEE Std 152-1991, IEEE Standard for Audio Program Level Measurement (ANSI).

[B11] IEEE Std 176-1987, IEEE Standard on Piezoelectricity.

[B12] ANSI/IEEE Std 260.1-1993, American National Standard Letter Symbols for Units of Measurement (SI Units, Customary Inch-Pound Units, and Certain Other Units).

[B13] IEEE Std 319-1990, IEEE Standard on Magnetostrictive Materials: Piezomagnetic Nomenclature (ANSI).

[B14] ISO 31: 1992, Quantities and units.

NOTE—May also be listed by its separate parts, e.g., Part 7: Acoustics.

[B15] ISO 532: 1975, Acoustics—Method for calculating loudness level.

[B16] ISO 717: 1982, Acoustics—Rating of sound insulation in buildings and of building elements.

[B17] Beranek, Blazier, and Figwer, *Journal of the Acoustical Society of America*, vol. 50, no. 1223, 1971.

[B18] Peterson, *Handbook of Noise Measurement*, 9th ed. GenRad, Inc., 1980.

Table 1—Space and time: symbols for quantities

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
1.1	angle, plane	$\alpha, \beta, \gamma, \theta, \phi, \psi$	radian, (numeric)	rad	Other Greek letters are permitted where no conflict results.
1.2	angle, solid	Ω, (ω)	steradian, (numeric)	sr	
1.3	length	l, L	meter	m	
1.4	breadth, width	b	meter	m	
1.5	height	h	meter	m	
1.6	thickness	d, δ	meter	m	
1.7	radius, distance from source	r, R	meter	m	
1.8	diameter	d, D	meter	m	
1.9	length of path, line segment, distance	s	meter	m	
1.10	wavelength	λ	meter	m	
1.12	circular wave number, angular wave number	k	radian per meter	rad/m	$k = 2\pi/\lambda$
1.13	area	A, (S)	square meter	m^2	
1.14	volume	V, v	cubic meter	m^3	
1.15	time	t	second	s	
1.16	period, time of one cycle	T	second	s	
1.17	time constant	τ, (T)	second	s	
1.18	frequency	f, (ν)	hertz	Hz	1 Hz is the frequency of a periodic phenomenon of which the period is 1 s.
1.18.1	bandwidth	B	hertz	Hz	
1.19	speed of rotation, rotational frequency	n	revolution per second	r/s	
1.20	angular frequency	ω	radian per second	rad/s	$\omega = 2\pi f$
1.21	angular velocity	ω	radian per second	rad/s	

Table 1—Space and time: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
1.23	angular acceleration	α	radian per second squared	rad/s^2	
1.24	velocity	v	meter per second	m/s	
1.25	speed of sound	c, (c_a)	meter per second	m/s	Not always equal to the phase velocity.
1.25.1	phase velocity	c_ϕ	meter per second	m/s	
1.25.2	group velocity	c_g	meter per second	m/s	
1.26	acceleration (linear)	a	meter per second squared	m/s^2	
1.27	acceleration of free fall, gravitational acceleration	g	meter per second squared	m/s^2	Standard value, g_n = 9.80665 m/s^2 (exact; see ISO 31-1: 1992 [B14]).
1.28	damping coefficient	δ	neper per second	Np/s	1 Np = 8.686 dB. If $f(t) = A\ e^{-\delta t} \sin(2\pi t/T)$, then δ is the damping coefficient.
1.29	logarithmic decrement	Λ	neper, (numeric)	Np	$\Lambda = T\delta$, where T and δ are as given in the equation for Item 1.28.
1.30	attenuation coefficient	α	neper per meter	Np/m	See Item 6.70.
1.31	phase coefficient	β	radian per meter	rad/m	Same as Item 6.71.
1.32	propagation coefficient	γ	reciprocal meter	m^{-1}	$\gamma = \alpha + j\beta$. See Item 6.72.

Table 2—Mechanics: symbols for quantities

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
2.1	mass	m	kilogram	kg	
2.2	(mass) density	ρ	kilogram per cubic meter	kg/m^3	Mass divided by volume.
2.3	momentum	p	kilogram meter per second	kg·m/s	1 kg·m/s = 1 N·s
2.4	moment of inertia	I, J	kilogram meter squared	kg·m^2	
2.5	second (axial) moment of area	I, I_a	meter to the fourth power	m^4	Items 2.5 and 2.6 should be distinguished from Item 2.4. They have often been given the name “moment of inertia.”
2.6	second (polar) moment of area	J, I_p	meter to the fourth power	m^4	
2.7	force	F	newton	N	
2.8	moment of force	M	newton meter	N·m	
2.9	torque	T, (M)	newton meter	N·m	
2.10	pressure	p	pascal	Pa	1 Pa = 1 N/m^2
2.11	normal stress	$\sigma, \sigma_{ii}, (\boldsymbol{T}_{ii})$	pascal	Pa	The reserve symbols in Items 2.11 to 2.16 are recommended for use in the context of piezoelectricity and piegzomanetism (magnetostriction).
2.12	shear stress	$\tau, \sigma_{ij}, (\boldsymbol{T}_{ij})$, where $i \neq j$	pascal	Pa	
2.13	stress tensor	$\sigma, (\boldsymbol{T})$	pascal	Pa	
2.14	linear strain	$\varepsilon, \varepsilon_{ii}, (\boldsymbol{S}_{ii})$	(numeric)		
2.15	shear strain	$\gamma, \varepsilon_{ij}, (\boldsymbol{S}_{ij})$, where $i \neq j$	(numeric)		
2.16	strain tensor	$\varepsilon, (\boldsymbol{S})$	(numeric)		
2.17	volume strain	θ	(numeric)		See Item 6.67.
2.18	Poisson’s ratio	μ, ν	(numeric)		Lateral contraction divided by elongation.

Table 2—Mechanics: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
2.19	Young's modulus, modulus of elasticity	E, (c_{qq})	pascal	Pa	$E = \sigma/\varepsilon$ See remark in Item 2.11.
2.20	shear modulus, modulus of rigidity	G, (c_{qp})	pascal	Pa	$G = \tau/\gamma$ See remark in Item 2.11.
2.21	bulk modulus	K	pascal	Pa	$K = -p/\theta$
2.22	work	W	joule	J	
2.23	energy	E, W	joule	J	U is recommended in thermodynamics for internal energy and for blackbody radiation.
2.23.1	potential energy	V, E_P	joule	J	
2.23.2	kinetic energy	T, E_K	joule	J	
2.24	energy (volume) density	w	joule per cubic meter	J/m^3	
2.25	power	P	watt	W	1 W = 1 J/s
2.26	efficiency	η	(numeric)		

Table 3—Heat: symbols for quantities

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
3.1	absolute temperature, thermodynamic temperature	T, (Θ)	kelvin	K	In 1967, the CGPM voted to give the name *kelvin* to the SI unit of temperature, which was formerly called *degree Kelvin*, and to assign it the symbol K (without the symbol °).
3.2	temperature, Celsius temperature	t, (θ)	degree Celsius	°C	The symbol °C is printed without space between ° and the letter that follows. The word *centigrade* has been abandoned as the name of a temperature scale. The degree Celsius is a special name for the kelvin for use with Celsius temperature and temperature intervals.
3.14	specific heat capacity	c	joule per kelvin kilogram	J/(K·kg)	Heat capacity divided by mass.
3.14.1	specific heat capacity at constant pressure	c_p	joule per kelvin kilogram	J/(K·kg)	
3.14.2	specific heat capacity at constant volume	c_v	joule per kelvin kilogram	J/(K·kg)	
3.14.3	ratio of specific heat capacities	γ	(numeric)		$\gamma = c_p / c_v$
3.14.4	heat capacity per unit volume	c_V	joule per kelvin cubic meter	$J/(K \cdot m^3)$	$c_V = c \cdot \rho$

Table 4—Radiation and light: symbols for quantities

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
4.6	velocity (speed) of electromagnetic waves in vacuum	c, c_o	meter per second	m/s	c = 299 792 458 m/s (exact; see ISO 31-6:1992 [B14]). When it is necessary to make a distinction between phase velocity in a medium and phase velocity in vacuum, c is used for the former and c_o for the latter.
4.7	radiant energy	Q, W, (U, Q_e)	joule	J	Energy emitted, transferred or received as radiation.
4.10	radiant power, radiant energy flux	P, Φ, (Φ_e)	watt	W	
4.13	radiant intensity	I, (I_e)	watt per steradian	W/sr	
4.15	radiant exitance	M, (M_e)	watt per square meter	W/m	Emitted radiant energy flux per unit area; formerly called radiant emittance.
4.16	irradiance	E, (E_e)	watt per square meter	W/m^2	Incident radiant energy flux per unit area.
4.21.1	emissivity	ε	(numeric)		Ratio of radiant exitance of a body to that of a black body at the same temperature.
4.29	luminous intensity	I, (I_v)	candela	cd	The candela is the luminous intensity, in a given direction, of a source that emits monochromatic radiation of frequency 540×10^{12} Hz and that has a radiant intensity in that direction of 1/683 W/sr.
4.30	luminous flux	Φ, (Φ_v)	lumen	lm	1 lm = 1 cd·sr
4.32	luminance	L, (L_v)	candela per square meter	cd/m^2	Luminous intensity per unit of projected area.
4.33	luminous exitance	M, (M_v)	lumen per square meter	lm/m^2	Emitted luminous flux per unit area; formerly called luminous emittance.
4.34	illuminance	E, (E_v)	lux	lx	Incident luminous flux per unit area; 1 lx = 1 lm/m^2.
4.36.1	luminous efficacy	K	lumen per watt	lm/W	$K = \Phi_v/\Phi_e$

Table 4—Radiation and light: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
4.40.1	spectral absorption factor, spectral absorptance	$\alpha\ (\lambda)$	(numeric)		Ratio of absorbed luminous flux to incident luminous flux.
4.40.2	spectral reflection factor, spectral reflectance	$\rho\ (\lambda)$	(numeric)		Ratio of reflected luminous flux to incident luminous flux.
4.44	refractive index	n	(numeric)		
4.51	numerical aperture	NA	(numeric)		A characteristic of an optical waveguide in terms of its acceptance of impinging light.

Table 5—Electricity and magnetism: symbols for quantities

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
5.1	electric charge, quantity of electricity	Q	coulomb	C	
5.3	surface density of charge	σ	coulomb per square meter	C/m^2	
5.5	electric field strength	E, (K)	volt per meter	V/m	
5.6	electrostatic potential, potential difference	V, (ϕ)	volt	V	
5.8	voltage, electromotive force	V, E, (U)	volt	V	
5.10	electric flux density, (electric) displacement	D	coulomb per square meter	C/m^2	
5.11	permittivity, absolute permittivity, capacitivity	ε	farad per meter	F/m	Of vacuum, ε_o
5.12	relative permittivity, dielectric constant, relative capacitivity	ε_r, κ	(numeric)		$\varepsilon_r = \varepsilon/\varepsilon_o$
5.18	(electric) current	I	ampere	A	
5.21	magnetic field strength	H	ampere per meter	A/m	
5.23	magnetomotive force	F, F_m	ampere	A	
5.24	magnetic flux	Φ	weber	Wb	1 Wb = 1 V·s
5.25	magnetic flux density, magnetic induction	B	tesla	T	$1\ T = 1\ Wb/m^2$
5.26	magnetic flux linkage	Λ	weber	Wb	
5.29	(magnetic) permeability, absolute permeability	μ	henry per meter	H/m	Of vacuum, μ_o
5.30	relative (magnetic) permeability	μ_r	(numeric)		$\mu_r = \mu/\mu_o$
5.35	magnetization	M	ampere per meter	A/m	$M = (B/\mu_o) - H$, where $\mu_o = 4\pi \times 10^{-7}$ H/m is the magnetic constant.
5.38	capacitance	C	farad	F	1 F = 1 C/V
5.40	(self-) inductance	L	henry	H	

Table 5—Electricity and magnetism: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
5.45	number of turns (in a winding)	N, n	(numeric)		
5.46	number of phases	m	(numeric)		
5.47	turns ratio	n, n_*	(numeric)		
5.47.1	transformer ratio	α	(numeric)		Square root of the ratio of the secondary to the primary self-inductance. Where the coefficient of coupling is high, $\alpha = n_*$
5.48	resistance	R	ohm	Ω	
5.49	resistivity, volume resistivity	ρ, ρ_e	ohm meter	Ω.m	
5.50	conductance	G	siemens	S	$G = \text{Re}\,Y$; the siemens was formerly called the mho.
5.51	conductivity	γ, σ, σ_e	siemens per meter	S/m	$\gamma = 1/\rho$; the symbol σ is used in field theory, as γ is used there for the propagation coefficient. See remark for Item 5.50.
5.52	reluctance	R, R_m	reciprocal henry	H^{-1}	Magnetic potential difference divided by magnetic flux.
5.53	permeance	P, P_m	henry	H	$P_m = 1/R_m$
5.54	impedance	Z	ohm	Ω	$Z = R + jX$
5.55	reactance	X	ohm	Ω	
5.58	quality factor	Q	(numeric)		$Q = 2\pi$ (peak energy stored)/(energy dissipated per cycle). For a simple reactor, $Q = \|X\|/R$.
5.59	admittance	Y	siemens	S	$Y = 1/Z = G + jB$ See remark for Item 5.50.
5.60	susceptance	B	siemens	S	$B = \text{Im}\,Y$ See remark for Item 5.50.
5.62	active power	P	watt	W	
5.63	reactive power	Q, (P_Q)	voltampere, var	VA, var	The special names “var” and symbol “var” are adopted by IEC for the SI-derived unit for reactive power.
5.64	apparent power	S, (P_S)	voltampere	VA	$S = P + jQ$

Table 5—Electricity and magnetism: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
5.65	power factor	F_P	(numeric)		$F_P = \cos \phi = P/S$
5.66	reactive factor	F_Q	(numeric)		$F_Q = \sin \phi = Q/S$
5.73	resonance frequency	f_r	hertz	Hz	
5.73.1	antiresonance frequency	f_a	hertz	Hz	
5.74	critical frequency, cutoff frequency	f_c	hertz	Hz	
5.74.1	cutoff frequencies, band limits	f_1, f_2	hertz	Hz	$f_1 < f_2$
5.74.2	(geometric) midband frequency	f_o	hertz	Hz	
5.75	resonance angular frequency	ω_r	radian per second	rad/s	
5.76	critical angular frequency, cutoff angular frequency	ω_c	radian per second	rad/s	
5.76.1	cutoff angular frequencies	ω_1, ω_2	radian per second	rad/s	$\omega_1 < \omega_2$
5.76.2	(geometric) midband angular frequency	ω_o	radian per second	rad/s	
5.77	resonance wavelength	λ_r	meter	m	
5.78	critical wavelength, cutoff wavelength	λ_c	meter	m	
5.82	phase angle, phase difference	ϕ, θ	radian	rad	

Table 6—Acoustics: symbols for quantities

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
6.1	static pressure	p_s	pascal	Pa	1 Pa = 1 N/m^2 = 10 μbar
6.2	sound pressure	p	pascal	Pa	
6.3	sound pressure spectral density	p_f^2	pascal squared per hertz	Pa^2/Hz	Also called sound pressure spectrum density.
6.4	spectral sound pressure	p_f	pascal per square root of hertz	Pa/Hz$^{1/2}$	
6.5	pressure impulse	p_I	pascal second	Pa·s	
6.6	pressure impulse spectral density, pressure impulse spectrum density	p_If^2	pascal squared second per hertz	Pa^{2}s/Hz	This quantity is derived from energy spectral density instead of power spectral density.
6.7	spectral pressure impulse	p_If	pascal square root of (second per hertz)	Pa(s/Hz)$^{1/2}$	
6.8	linear displacement	x, ξ_x, (s)	meter	m	Of a mechanical vibrating system.
6.9	rotational displacement	ϕ	radian	rad	
6.10	sound particle displacement	ξ	meter	m	For Items 6.10 to 6.18, the *x*, *y*, and *z* components of vector quantities may be designated by appropriate subscripts.
6.11	sound particle displacement spectral density	ξ_f^2	meter squared per hertz	m^2/Hz	
6.12	spectral sound particle displacement	ξ_f	meter per square root of hertz	m/Hz$^{1/2}$	
6.13	sound particle velocity	u, v	meter per second	m/s	
6.14	sound particle velocity spectral density	u_f^2, v_f^2	(meter per second) squared per hertz	(m/s)^2/Hz	
6.15	spectral sound particle velocity	u_f, v_f	(meter per second) per square root of hertz	(m/s)/Hz$^{1/2}$	
6.16	sound particle acceleration	α	meter per second squared	m/s^2	

Table 6—Acoustics: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
6.17	sound particle acceleration spectral density	α_f^2	meter squared per (fourth power of second) times hertz	$m^2/(s^4Hz)$	
6.18	spectral sound particle acceleration	α_f	meter per second squared times square root of hertz	$m/(s^2Hz^{1/2})$	
6.19	volume velocity	q, U	cubic meter per second	m^3/s	
6.20	volume velocity spectral density	q_f^2, U_f^2	meter to sixth power per second squared times hertz	$m^6/(s^2Hz)$	
6.21	spectral volume velocity	q_f, U_f	cubic meter per second times square root of hertz	$m^3/(sHz^{1/2})$	
6.22	volume displacement	V, (ΔV)	cubic meter	m^3	
6.23	strength of a simple source	Q_o	cubic meter per second	m^3/s	
6.24	velocity potential	ϕ	square meter per second	m^2/s	
6.25	sound intensity	I, (J)	watt per square meter	W/m^2	
6.26	sound power	P, (W)	watt	W	
6.27	sound energy	E	joule	J	Use subscripts P and K to denote potential and kinetic energy. See Items 2.23a and 2.23b.
6.28	sound energy density	w, (e)	joule per cubic meter	J/m^3	
6.29	sound exposure at x dB per halving of duration	E_x	pascal to the $6/x$ power times hour	$Pa^{6/x}h$	$E_x = \int_0^t p^{6/x} dt$ The sound pressure may be frequency weighted.
6.30	sound exposure at 3 dB per halving of duration	E, (E_3)	pascal squared times hour	Pa^2h	1 Pa^2h is the exposure for 8 h at 85 dB re 20 μPa.

Table 6—Acoustics: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
6.31	sound exposure at 5 dB per halving of duration	F, (E_5)	pascal to the 1.2 power times hour	$Pa^{1.2}h$	1 $Pa^{1.2}h$ is the exposure for 8 h at 79 dB re 20 µPa.
6.32	characteristic imped-ance of a medium	Z_c, (z)	pascal second per meter	Pa·s/m	$Z_c = \rho c$
6.33	specific acoustic impedance	Z_s	pascal second per meter	Pa·s/m	$Z_s = p/u$
6.34	specific acoustic admittance	Y_s	meter per pascal second	m/(Pa·s)	$Y_s = 1/Z_s$
6.35	acoustic impedance	Z_a	pascal second per cubic meter	$Pa{\cdot}s/m^3$	$Z_a = Z_s/A = R_a + jX_a$
6.36	acoustic resistance	R_a	pascal second per cubic meter	$Pa{\cdot}s/m^3$	
6.37	acoustic reactance	X_a	pascal second per cubic meter	$Pa{\cdot}s/m^3$	$X_a = m_a\omega - K_a/\omega$
6.38	acoustic mass, acoustic inertance	m_a	pascal second squared per cubic meter	$Pa{\cdot}s^2/m^3$	$m_a = X_a/\omega$ $1\ Pa{\cdot}s^2/m^3 = 1\ kg/m^4$
6.39	acoustic stiffness	K_a	pascal per cubic meter	Pa/m^3	$K_a = -\omega X_a$
6.40	acoustic admittance	Y_a	cubic meter per pascal second	$m^3/(Pa{\cdot}s)$	$Y_a = 1/Z_a = G_a + jB_a$
6.41	acoustic conductance	G_a	cubic meter per pascal second	$m^3/(Pa{\cdot}s)$	
6.42	acoustic susceptance	B_a	cubic meter per pascal second	$m^3/(Pa{\cdot}s)$	
6.43	acoustic compliance	C_a	cubic meter per pascal	m^3/Pa	$C_a = 1/K_a$
6.44	mechanical impedance	Z_m	newton second per meter	N·s/m	$Z_m = AZ_s = F/v = R_m + jX_m$
6.45	mechanical resistance	R_m, (c)	newton second per meter	N·s/m	Also called damping coeffi-cient, but that is deprecated for this purpose. See Item 6.69.
6.46	mechanical reactance	X_m	newton second per meter	N·s/m	$X_m = m_m\omega - K_m/\omega$
6.47	dynamic mass	m_m	kilogram	kg	$m_m = X_m/\omega$

Table 6—Acoustics: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
6.48	dynamic stiffness	K_m, k	newton per meter	N/m	$K_m = -\omega X_m$
6.49	mechanical admittance	Y_m	meter per newton second	m/(N·s)	$Y_m = 1/Z_m = v/F = G_m + jB_m$
6.50	mechanical conductance	G_m	meter per newton second	m/(N·s)	
6.51	mechanical susceptance	B_m	meter per newton second	m/(N·s)	
6.52	mechanical compliance	C_m	meter per newton	m/N	$C_m = 1/K_m$
6.53	rotational impedance	Z_r	newton meter second per radian	N·m·s/rad	$Z_r = T/\omega = R_r + jX_r$
6.54	rotational resistance	R_r	newton meter second per radian	N·m·s/rad	
6.55	rotational reactance	X_r	newton meter second per radian	N·m·s/rad	
6.56	rotational inertance	m_r	kilogram meter squared per radian	kg·m^2/rad	$m_r = X_r/\omega$
6.57	dynamic torsional stiffness	K_r	newton meter per radian	N·m/rad	$K_r = -\omega X_r$
6.58	rotational admittance	Y_r	radian per newton meter second	rad/(N·m·s)	$Y_r = 1/Z_r = G_r + jB_r$
6.59	rotational conductance	G_r	radian per newton meter second	rad/(N·m·s)	
6.60	rotational susceptance	B_r	radian per newton meter second	rad/(N·m·s)	
6.61	rotational compliance	C_r	radian per newton meter	rad/(N·m)	$C_r = 1/K_r$
6.62	average (mass) density	ρ_o	kilogram per cubic meter	kg/m^3	
6.63	instantaneous density	ρ	kilogram per cubic meter	kg/m^3	
6.64	condensation	s	(numeric)		$s = (\rho - \rho_o)/\rho_o$

Table 6—Acoustics: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
6.65	parameter of nonlinearity	B/A, Λ	(numeric)		$B/A = (\rho_o/c_o^2).(\partial^2 p/\partial\rho^2)$
6.66	coefficient of nonlinearity	β	(numeric)		$\beta = 1 + B/(2A)$ For gases, $\beta = (1 + \gamma)/2$
6.67	dilatation	θ, (Δ)	(numeric)		$\theta = \mathrm{d}V/V$; same as volume strain; see Item 2.17.
6.68	logarithmic decrement	Λ	neper	Np	l Np = 8.686 dB. The bel is the base SI unit. The decibel is a commonly used submultiple.
6.69	damping coefficient, decay rate	δ	neper per second, decibel per second	Np/s dB/s	See Items 6.68 and 6.45. See ISO 31-1992 [B14].
6.70	attenuation coefficient	α	neper per meter decibel per meter	Np/m dB/m	Same as Item 1.30; see Item 6.68. In a plane sound wave traveling along x, the amplitudes of pressure, displacement, and velocity are proportional to $e^{-\alpha x}$, while the energy, power, and intensity are proportional to $e^{-2\alpha x}$.
6.71	phase coefficient	β	radian per meter	rad/m	Same as Item 1.31.
6.72	propagation coefficient	γ	reciprocal meter	m^{-1}	If α is in nepers per meter, $\gamma = \alpha + j\beta$.
6.73	field quantity dissipation coefficient	ζ	(numeric)		$\zeta = 1/(2Q)$
6.73.1	energy dissipation coefficient	2ζ, (ψ)	(numeric)		The factor 2 is needed because energy dissipation is proportional to the square of field quantity dissipation.
6.74	energy reflection coefficient	ρ	(numeric)		
6.75	amplitude reflection coefficient	r	(numeric)		$r = \rho^{1/2}$
6.76	energy transmission coefficient	τ	(numeric)		$\delta + \rho + \tau = 1$
6.77	amplitude transmission coefficient	t	(numeric)		$t = \tau^{1/2}$
6.78	index of refraction	n, n_{ij}	(numeric)		From medium i to medium j.

Table 6—Acoustics: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
6.79	absorption coefficient at incidence angle θ	α_θ	(numeric)		
6.80	statistical absorption coefficient, random incidence energy absorption coefficient	α	(numeric)		$\alpha + \rho = 1$
6.81	reverberation time	T_{60}, T	second	s	For 60 dB decay.
6.82	Sabine absorption	A	metric sabin	Sa	See ANSI S1.1-1994 [B1]. $A = 24$ (ln 10) (dB)$V/(cT_{60})$ 1 Sa = 1 (dB)·m^2. The metric sabin is not an SI unit.
6.83	Sabine absorption coefficient	a, (α_{Sab})	metric sabin per square meter	Sa/m^2	
6.84	mean free path	l	meter	m	
6.85	collision frequency	ν	reciprocal second	s^{-1}	$\nu = c/l$
6.86	room constant	R	square meter	m^2	$R = \alpha S/(1 - \alpha)$
6.87	porosity	Y	(numeric)		Volume of voids per total volume.
6.88	specific flow resistance	R_{f}	pascal second per meter	Pa·s/m	
6.89	flow resistivity	σ	pascal second per square meter	Pa·s/m^2	Flow resistance per unit length.
6.90	flare coefficient of a horn	m	reciprocal meter	m^{-1}	
6.91	beamwidth at -3 dB	θ_3, $\Delta\theta_3$	radian, degree	rad °	
6.92	beamwidth at -6 dB	θ_6, $\Delta\theta_6$	radian, degree	rad °	
6.93	beamwidth at -10 dB	θ_{10}, $\Delta\theta_{10}$	radian, degree	rad °	
6.94	beamwidth between first nulls	θ_∞, $\Delta\theta_\infty$	radian, degree	rad °	
6.95	relative field quantity response	Γ	(numeric)		Ratio of response at an angle to response on specified axis.

Table 6—Acoustics: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
6.96	angular deviation loss	N_δ, $N_{\theta\phi}$	decibel	dB	$N_\delta = 20 \log \Gamma$ See Items 6.68 and 6.69.
6.97	transmitter deviation loss	$N_{\delta \mathrm{T}}$	decibel	dB	
6.98	receiver deviation loss	$N_{\delta \mathrm{R}}$	decibel	dB	
6.99	directivity factor	γ	(numeric)		$\gamma = \dfrac{4\pi}{\int_{4\pi} \Gamma^2 \mathrm{d}\Omega}$
6.100	directivity index	N_{DI}	decibel	dB	$N_{\mathrm{DI}} = 10 \log \gamma$
6.101	reverberation factor	η	(numeric)		$\eta = \dfrac{4\pi}{\int_{4\pi} \Gamma^4 \mathrm{d}\Omega}$
6.102	reverberation index	N_{RI}	decibel	dB	$N_{\mathrm{RI}} = 10 \log \eta$
6.103	array gain	N_{AG}	decibel	dB	
6.104	Mach number	ε, M	(numeric)		$\varepsilon = v/c$

Table 7—Electroacoustics: symbols for quantities

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
7.1	reciprocity parameter for spherical waves	J	watt per pascal squared	W/Pa^2	$J = 2d/(\rho f)$
7.2	reciprocity parameter for cylindrical waves	J_c	watt per pascal squared	W/Pa^2	
7.3	reciprocity parameter for plane waves	J_p	watt per pascal squared	W/Pa^2	
7.4	reciprocity parameter for diffuse sound	J_{df}	watt per pascal squared	W/Pa^2	
7.5	transfer impedance of projector and hydrophone	Z_{ph}	ohm	Ω	
7.6	electrical impedance of transducer in vacuo	Z_f, Z_{ef}	ohm	Ω	
7.7	electrical admittance of transducer in vacuo	Y_f, Y_{ef}	siemens	S	
7.8	electrical impedance of clamped transducer	Z_c, Z_{ec}	ohm	Ω	
7.9	electrical admittance of clamped transducer	Y_c, Y_{ec}	siemens	S	
7.10	motional impedance	$\mathrm{Z_m}$, $\mathrm{Z_{em}}$	ohm	Ω	
7.11	motional admittance	Y_m, Y_{em}	siemens	S	
7.12	general symbol for response of transducer	T_{yx}, M_{yx}, (S_x, M_y)	various		y is related to the output and x to the input. T_{yx} is used primarily for couplers and M_{yx} for sound fields. f and d may be used as additional subscripts to indicate free-field and diffuse-field conditions respectively. S is used for emission and M for reception in couplers.
7.13	pressure response in coupler to voltage	T_{pU}, (S_U)	pascal per volt	Pa/V	
7.14	pressure response in sound field to voltage	M_{pU}	pascal meter per volt	Pa·m/V	
7.15	particle velocity response in sound field to voltage	M_{vU}	square meter per volt second	$m^2/(V \cdot s)$	

Table 7—Electroacoustics: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
7.16	pressure response in coupler to current	T_{pI}, (S_I)	pascal per ampere	Pa/A	
7.17	pressure response in sound field to current	M_{pI}	pascal meter per ampere	Pa·m/A	
7.18	particle velocity response in sound field to current	M_{vI}	square meter per ampere second	m^2/(A·s)	
7.19	pressure response in coupler to power	T_{pP}, (S_P)	pascal per square root of watt	Pa/$W^{1/2}$	
7.20	pressure response in sound field to power	M_{pP}	pascal meter per square root of watt	Pa·m/$W^{1/2}$	
7.21	particle velocity response in sound field to power	M_{vP}	square meter per second times square root of watt	m^2/($W^{1/2}$s)	
7.22	open-circuit voltage response to pressure in coupler	T_{Up}, (M_U)	volt per pascal	V/Pa	
7.23	open-circuit voltage response to pressure in sound field	M_{Up}	volt per pascal	V/Pa	
7.24	open-circuit voltage response to particle velocity in sound field	M_{Uv}	volt second per meter	V·s/m	
7.25	short-circuit current response to pressure in coupler	T_{Ip}, (M_I)	ampere per pascal	A/Pa	
7.26	short-circuit current response to pressure in sound field	M_{Ip}	ampere per pascal	A/Pa	
7.27	short-circuit current response to particle velocity in sound field	M_{Iv}	ampere second per meter	A·s/m	
7.28	power response to pressure in coupler	T_{Pp}, (M_P)	square root of watt per pascal	$W^{1/2}$/Pa	
7.29	power response to pressure in sound field	M_{Pp}	square root of watt per pascal	$W^{1/2}$/Pa	

Table 7—Electroacoustics: symbols for quantities *(continued)*

Item	Quantity	Quantity symbol	Unit based on international system	Unit symbol	Remarks
7.30	power response to particle velocity in sound field	M_{Pv}	second square root of watt per meter	$W^{1/2}s/m$	

NOTE—Letter symbols for piezoelectric constants are given in IEEE Std 176-1987 [B11]. Letter symbols for piezomagnetic (magnetostrictive) constants are given in IEEE Std 319-1990 [B13].

Table 8—Underwater sound: abbreviations and symbols for quantities

Item	Quantity	Abbreviation	Quantity symbol	Unit symbol	Remarks
8.1	source level	SL	L_S	dB	Of a projector.
8.2	source spectrum level		L_{Sf}	dB	
8.3	sonar dome loss		N_D	dB	
8.4	incident sound pressure level of signal	IL	L_i	dB	
8.5	echo level	EL	L_e	dB	
8.6	incident sound pressure spectrum level of signal		L_{if}	dB	
8.7	sound pressure level of noise, self-noise level	NL	L_N, (L_B)	dB	Use subscripts to denote noise components.
8.8	sound pressure spectrum level of noise		L_{Nf}	dB	
8.9	bandwidth level correction		N_{BW}	dB	
8.10	spreading loss		N_{spr}	dB	
8.11	attenuation loss		N_{attn}	dB	
8.12	(one-way) propagation loss, transmission loss in water	TL	N_W	dB	$N_W = N_{spr} + N_{attn}$
8.13	multiple ray path gain, summation gain		N_S	dB	
8.14	target strength	TS	N_{TS}	dB	
8.15	reverberation level	RL	L_R	dB	
8.16	reverberation strength	RS	N_{RS}	dB	
8.17	wake strength	WS	N_{WS}	dB	
8.18	signal-to-noise differential, signal differential		$\Delta L_{S/N}$	dB	
8.19	detection threshold	DT	N_{DT}	dB	$N_{DT} = -N_p + N_T + N_{SD}$
8.20	signal processing gain		N_p	dB	
8.21	thresholding loss		N_T	dB	

Table 8—Underwater sound: abbreviations and symbols for quantities *(continued)*

Item	Quantity	Abbreviation	Quantity symbol	Unit symbol	Remarks
8.22	signal differential for recognition		N_{SD}	dB	
8.23	minimum detectable signal level	MDS	L_{MD}	dB	
8.24	signal excess	SE	N_{SE}	dB	$N_{SE} = L_i - L_{MD}$
8.25	design margin		N_M	dB	Margin for reliable operation.
8.26	figure of merit	FOM	N_{FM}	dB	

Table 9—Levels and noise ratings: abbreviations and symbols for quantities

Item	Quantity	Abbreviation	Quantity symbol	Unit symbol	Remarks
9.1	sound pressure level in a stated frequency band	SPL	L_p	dB	The symbol *N* for sound pressure level is deprecated.
9.2	fast A-weighted sound (pressure) level	FA	L_{AF}	dB	
9.3	slow A-weighted sound (pressure) level	SA	L_{AS}	dB	
9.4	fast B-weighted sound (pressure) level	FB	L_{BF}	dB	
9.5	slow B-weighted sound (pressure) level	SB	L_{BS}	dB	
9.6	fast C-weighted sound (pressure) level	FC	L_{CF}	dB	
9.7	slow C-weighted sound (pressure) level	SC	L_{CS}	dB	
9.8	fast D-weighted sound (pressure) level	FD	L_{DF}	dB	
9.9	slow D-weighted sound (pressure) level	SD	L_{DS}	dB	
9.10	octave-band sound pressure level	OBSPL	$L_{1/1}$	dB	
9.11	one-third-octave-band sound (pressure) level	TOBSPL	$L_{1/3}$	dB	
9.11.1	band pressure level	BSPL	$L_{p\,\mathrm{b}}$	dB	Defined in ANSI S1.1-1994 [B1], Item 4.09. When bandwidth equals 1 Hz, also called spectrum level.
9.12	sound power level	PWL	L_P, (L_W)	dB	
9.13	A-weighted sound power level	APWL	$L_{P\,\mathrm{A}}$, ($L_{W\,\mathrm{A}}$)	dB	Substitute B, C, D, etc. to denote other weightings.
9.14	product noise rating, hemispherical source sound level	PNR		dB	Space average sound level at 1 m.
9.15	sound pressure spectrum level, sound pressure spectral level	PSL	$L_{p\,\mathrm{s}}$	dB	For a bandwidth of 1 Hz, as defined in IEEE Std 100-1992 [B9].

Table 9—Levels and noise ratings: abbreviations and symbols for quantities *(continued)*

Item	Quantity	Abbreviation	Quantity symbol	Unit symbol	Remarks
9.15.1	sound pressure spectrum density level, sound pressure spectral density level		$L_{p\ \mathrm{ds}}$	dB	In the limit, as the bandwidth approaches zero, as defined in ANSI S1.1-1994 [B1], Item 4.10, and in IEC 50-801: 1994 [B8], entry 801-22-13.
9.16	impulse A-weighted sound level	IAL	L_{AI}	dB	Substitute B, C, D, etc. to denote other weightings.
9.17	time average A-weighted sound level	TAL	$L_{\mathrm{A}T}$	dB	$L_{\mathrm{A}T} = 10 \log [\mathrm{E} /(p_0{}^2 T)]$ where $p_0 = 20$ µPa.
9.17.1	time interval equivalent continuous sound level	TAL	$L_{\mathrm{Aeq}T}$	dB	Same as time average A-weighted sound level.
9.18	hourly average sound level	1HL	L_{1h}	dB	Also called 1 h equivalent continuous sound level. See ANSI S1.1-1994 [B1], Item 4.15.
9.19	8-h average sound level	8HL	L_{8h}	dB	
9.19.1	8-h average A-weighted sound level	8HAL	L_{A8h}	dB	Substitute B, C, D, etc. to denote other weightings.
9.20	day average sound level	DL	L_{d}	dB	0700–2200 h See ANSI S1.1-1994 [B1], Item 4.16.
9.21	daytime average sound level	DTL	L_{d12}	dB	0700–1900 h
9.22	evening average sound level	EL	L_{ev}	dB	1900–2200 h
9.23	night average sound level	NL	L_{n}	dB	0000–0700 h and 2200–2400 h See ANSI S1.1-1994 [B1], Item 4.17.
9.24	day-night average sound level	DNL	L_{dn}	dB	24 h average after 10 dB added to L_{n}. See ANSI S1.1-1994 [B1], Item 4.18.
9.25	community noise equivalent level	CNEL	L_{den}	dB	24 h average after 5 dB added to L_{ev} and 10 dB to L_{n}. See ANSI S1.1-1994 [B1], Item 4.19.
9.26	A-weighted sound exposure level	ASEL, SEL	L_{AE}	dB	The level of E (see Item 6.30) re (20 µPa)^2 and 1 s. Substitute B, C, D, etc. to denote other weightings. See ANSI S1.1-1994 [B1], Item 4.21.

Table 9—Levels and noise ratings: abbreviations and symbols for quantities *(continued)*

Item	Quantity	Abbreviation	Quantity symbol	Unit symbol	Remarks
9.27	fast, A-weighted sound level exceeded 10% of time		L_{10}	dB	Other exceeded percentiles are similarly indicated.
9.28	noise pollution level	NPL	L_{NP}	dB	$L_{\mathrm{NP}} = L_{\mathrm{Aeq}T} + 2.56\ \sigma$ The constant 2.56 is subject to revision. σ = standard deviation.
9.29	maximum A-weighted sound level	MXAL	L_{Amax}	dB	Greatest fast, A-weighted sound level during an event, unless other time and frequency weightings are indicated by appropriate subscripts. See ANSI S1.1-1994 [B1], Item 4.21.
9.30	peak A-weighted sound level	PKAL	L_{Apk}	dB	Greatest instantaneous, A-weighted sound level, unless other time and frequency weightings are indicated by appropriate subscripts. See ANSI S1.1-1994 [B1], Item 4.19.
9.31	noise and number index	NNI		dB	$L_{\mathrm{PNmax}} + 15 \log n$ -80 n = number of audible events.
9.32	traffic noise index	TNI		dB	$L_{90} + 4\ (L_{10} - L_{90})$ -30
9.33	noise criterion level	NC		dB	See *ASHRAE Handbook: Fundamentals, SI Edition* [B6].
9.33.1	balanced noise criterion	BNC		dB	
9.33.2	room criterion	RC		dB	
9.33.3	noise rating	NR		dB	See Peterson, *Handbook of Noise Measurement*, 9th ed., paragraph 4.11 [B18].
9.34	preferred frequency noise criterion level	PNC		dB	See Beranek, Blazier, and Figwer [B17].
9.35	rating sound level		L_{r}	dB	24 h average sound level plus any correction for tone or impulse.
9.36	ARI sound rating number	SRN		3.3 dB	Equal to 0.4 plus 0.30 times A-weighted sound level at 10 ft (3.048 m). (See ARI Std 275-1984 [B5].)
9.37	ARI sound level number	SLN		3.3 dB	Such use of “sound level” is deprecated.

Table 9—Levels and noise ratings: abbreviations and symbols for quantities *(continued)*

Item	Quantity	Abbreviation	Quantity symbol	Unit symbol	Remarks
9.38	sound transmission loss, sound insulation (of a partition)	TL	R	dB	See ANSI S1.1-1994 [B1], Item 11.43.
9.39	noise reduction	NR, (D)	D_f	dB	Quantity is also called “level difference” and “sound isolation between rooms.” See ANSI S1.1-1994 [B1], Item 11.41.
9.40	level reduction (by a barrier)	LR		dB	
9.41	sound level difference	SLD	D_{A}	dB	See ANSI S1.1-1994 [B1], Item 11.41.
9.42	field transmission loss (of a partition)	FTL		dB	
9.43	sound transmission class (of a partition)	STC		dB	See ANSI S1.1-1994 [B1], Item 11.45.
9.44	field sound transmission class (of a partition)	FSTC		dB	
9.45	airborne sound insulation (of a partition)		I_{a}	dB	See ISO 717: 1982 [B16].
9.46	noise isolation class (between rooms)	NIC		dB	See ANSI S1.1-1994 [B1], Item 11.47.
9.47	normalized noise isolation class (between rooms)	NNIC		dB	Normalized to T_{60} = 0.5 s. See ANSI S1.1-1994 [B1], Item 11.18.
9.48	airborne sound insulation margin		M_{a}	dB	$M_{\mathrm{a}} = I_{\mathrm{a}} - 52$
9.49	impact-sound pressure level		L_{N}	dB	See ANSI S1.1-1994 [B1], Item 11.51.
9.49.1	normalized impact-sound pressure level		L_{Nn}	dB	See ANSI S1.1-1994 [B1], Item 11.52.
9.50	impact isolation class	IIC		dB	115 dB minus normalized octave-band impact-sound pressure level at 500 Hz.
9.50.1	impact insulation class	IIC		dB	100 dB minus normalized impact-sound index.
9.51	impact-sound index		I_{i}	dB	See ISO 717: 1982 [B16].

Table 9—Levels and noise ratings: abbreviations and symbols for quantities *(continued)*

Item	Quantity	Abbreviation	Quantity symbol	Unit symbol	Remarks
9.52	impact protection margin		M_i	dB	$M_\mathrm{i} = 65 - L_1$
9.53	vibratory acceleration level	VAL	L_a	dB	
9.53.1	vibratory jerk level	VJL	L_j	dB	
9.54	vibratory velocity level	VVL	L_v	dB	
9.55	vibratory displacement level	VDL	L_d	dB	
9.56	vibratory force level	VFL	L_F	dB	See ANSI S1.1-1994 [B1], Item 4.25.
9.57	sound intensity level	IL	L_I	dB	See ANSI S1.1-1994 [B1], Item 4.24.
9.58	sound energy density level		L_w	dB	
9.59	sound energy level		L_E	dB	
9.60	volume of an electrical audio program			vu	1 vu = 1 dB To be used only with complex waves when measured by a standard volume indicator (see IEEE Std 152-1991 [B10]).
9.61	frequency level		N		See ANSI S1.1-1994 [B1], Item 4.05.

Table 10—Psychoacoustics: abbreviations and symbols for quantities

Item	Quantity	Abbreviation	Quantity symbol	Unit symbol	Remarks
10.1	judged loudness		λ	sone	One sone is the loudness of a pure tone presented frontally as a plane wave of 1000 Hz and a sound pressure level of 40 dB re 20 µPa. See ISO 31-7: 1992 [B14].
10.2	judged loudness level		L_λ	phon	See ANSI S1.1-1994 [B1], Item 12.05. $L_\lambda = L_p$ of equally loud 1 kHz tone frontally presented. Also see ISO 31-7: 1992 [B14].
10.3	calculated loudness		N	sone	
10.4	calculated loudness level	LL	L_N	phon	See ISO 532: 1975 [B15]. Also, see ANSI S1.1-1994 [B1], Item 12.06.
10.5	noisiness		n	noy	See ANSI S1.1-1994 [B1], Items 12.12 and 12.13.
10.6	perceived noise level	PNL	L_{PN}	dB	
10.7	maximum perceived noise level	MXPNL	L_{PNmax}	dB	
10.8	tone-corrected perceived noise level	TPNL	L_{PNT}	dB	
10.9	maximum tone-corrected perceived noise level	MXTPNL	L_{PNTmax}	dB	Calculated from maximum band levels during flyover.
10.10	effective perceived noise level	EPNL	L_{PNE}	dB	$L_{\mathrm{PNE}} = 10 \log (1/T_{\mathrm{o}}) \cdot \int_0^T 10^{\frac{L_{\mathrm{PN}}}{10}} \mathrm{d}t$ where T_{o} = 10 s, and time T includes all significant sound.
10.11	equivalent continuous perceived noise level	QPNL	L_{PNeq}	dB	$L_{\mathrm{PNeq}} = 10 \log (1/T_{\mathrm{o}}) \cdot \int_0^T 10^{\frac{L_{\mathrm{PN}}}{10}} \mathrm{d}t$
10.12	weighted equivalent continuous perceived noise level	WEPNL		dB	QPNL after 10 dB added to levels from 2200–0700 h.

Table 10—Psychoacoustics: abbreviations and symbols for quantities *(continued)*

Item	Quantity	Abbreviation	Quantity symbol	Unit symbol	Remarks
10.13	noise exposure forecast (aircraft)	NEF		dB	L_{PNE} + 10 log (N_d + 17 N_n) – 88 N_d = operations 0700–2200 h N_n = operations 2200–0700 h
10.14	composite noise rating (aircraft)	CNR		dB	L_{PNmax} + 10 log (N_d + 17 N_n) –12
10.15	speech interference level	SIL		dB	Mean of octave-band levels 600–1200 Hz, 1200–2400 Hz, and 2400–4800 Hz.
10.16	preferred frequency speech interference level	PSIL		dB	Mean of octave-band levels centered on 0.5 kHz, 1 kHz, and 2 kHz.
10.17	speech interference level defined by ANSI S3.14-1977 [B2]	SIL (0.5–4)		dB	Mean of octave-band levels centered on 0.5 kHz, 1kHz, 2 kHz, and 4 kHz.
10.18	speech intelligibility, articulation	SI	I	%	Percentage of speech elements understood correctly.
10.19	articulation index	AI	(numeric)		Speech level minus noise level, divided by 30 dB.
10.20	hearing level, (hearing loss)	HL		dB	
10.21	noise-induced hearing loss	NIHL		dB	
10.22	noise-induced permanent threshold shift	NIPTS		dB	
10.23	temporary threshold shift 2 min after cessation of noise	TTS2		dB	
10.24	effective damage risk level	EDRL		dB	
10.25	composite damage risk	CDR		dB	

Table 11—Alphabetical list of quantity symbols

Symbol	Item	Quantity
a	1.26	linear acceleration
	6.83	Sabine absorption coefficient
A	1.13	area
	6.82	Sabine absorption
b	1.4	breadth, width
B	1.18.1	bandwidth
	5.25	magnetic flux density, magnetic induction
	5.60	susceptance
B_a	6.42	acoustic susceptance
B_m	6.51	mechanical susceptance
B_r	6.60	rotational susceptance
B/A	6.65	parameter of nonlinearity
c	1.25	speed of sound
	3.14	specific heat capacity
	4.6	velocity (speed) of electromagnetic waves in vacuum
	6.45	mechanical resistance
c_a	1.25	speed of sound
c_g	1.25.2	group velocity
c_p	3.14.1	specific heat capacity at constant pressure
c_{qp}	2.20	shear modulus, modulus of rigidity
c_{qq}	2.19	Young’s modulus, modulus of elasticity
c_v	3.14.2	specific heat capacity at constant volume
c_V	3.14.4	heat capacity per unit volume
c_ϕ	1.25.1	phase velocity
c_o	4.6	velocity (speed) of electromagneticwaves in vacuum
C	5.38	capacitance
C_a	6.43	acoustic compliance
C_m	6.52	mechanical compliance
C_r	6.61	rotational compliance
d	1.6	thickness
	1.8	diameter
D	1.8	diameter
	5.10	electric flux density, electric displacement
D_A	9.41	sound level difference
D_f	9.39	noise reduction
e	6.28	sound energy density
E	2.19	Young’s modulus, modulus of elasticity
	2.23	energy
	4.16	irradiance
	4.34	illuminance
	5.5	electric field strength
	5.8	voltage, electromotive force
	6.27	sound energy
	6.30	sound exposure at 3 dB per halving of duration
E_e	4.16	irradiance
E_K	2.23.2	kinetic energy
E_P	2.23.1	potential energy

Table 11—Alphabetical list of quantity symbols (*continued*)

Symbol	Item	Quantity
E_v	4.34	illuminance
E_x	6.29	sound exposure at x dB per halving of duration
E_3	6.30	sound exposure at 3 dB per halving of duration
E_5	6.30	sound exposure at 5 dB per halving of duration
f	1.18	frequency
f_a	5.73.1	antiresonance frequency
f_c	5.74	critical frequency, cutoff frequency
f_r	5.73	resonance frequency
f_o	5.74.2	midband frequency
f_1, f_2	5.74.1	cutoff frequencies, band limits
F	2.7	force
	5.23	magnetomotive force
	6.31	sound exposure at 5 dB per halving of duration
F_m	5.23	magnetomotive force
F_P	5.65	power factor
F_Q	5.66	reactive factor
g, g_n	1.27	acceleration of free fall, gravitational aceleration
G	2.20	shear modulus, modulus of rigidity
	5.50	conductance
G_a	6.41	acoustic conductance
G_m	6.50	mechanical conductance
G_r	6.59	rotational conductance
h	1.5	height

Symbol	Item	Quantity
H	5.21	magnetic field strength
I	2.4	moment of inertia
	2.5	second (axial) moment of area
	4.13	radiant intensity
	4.29	luminous intensity
	5.18	electric current
	6.25	sound intensity
	10.18	speech intelligibility, articulation
I_a	2.5	second (axial) moment of area
	9.45	airborne sound insulation
I_e	4.13	radiant intensity
I_i	9.51	impact sound index
I_p	2.6	second (polar) moment of area
I_v	4.29	luminous intensity
J	2.4	moment of inertia
	2.6	second (polar) moment of area
	6.25	sound intensity
	7.1	reciprocity parameter for spherical waves
J_c	7.2	reciprocity parameter for cylindrical waves
J_{df}	7.4	reciprocity parameter for diffuse sound
J_p	7.3	reciprocity parameter for plane waves
k	1.12	circular wave number, angular wave number

Table 11—Alphabetical list of quantity symbols (*continued*)

Symbol	Item	Quantity
	6.48	dynamic stiffness
K	2.21	bulk modulus
	4.36.1	luminous efficacy
	5.5	electric field strength
K_a	6.39	acoustic stiffness
K_m	6.48	dynamic stiffness
K_r	6.57	dynamic torsional stiffness
l	1.3	length
	6.84	mean free path
L	1.3	length
	4.32	luminance
	5.40	self-inductance
L_a	9.53	vibratory acceleration level
L_AE	9.26	A-weighted sound exposure level
L_AF	9.2	fast A-weighted sound pressure level
L_AI	9.16	impulse A-weighted sound level
L_Amax	9.29	maximum A-weighted sound level
L_Apk	9.30	peak A-weighted sound level
L_AS	9.3	slow A-weighted sound pressure level
$L_{\mathrm{A}T}$	9.17	time average A-weighted-sound level
$L_{\mathrm{Aeq}T}$	9.17.1	time interval equivalent continuous sound level
L_A8h	9.19.1	8-h average A-weighted sound level
L_B	8.7	sound pressure level of noise, self-noise level
L_BF	9.4	fast B-weighted sound pressure level
L_BS	9.5	slow B-weighted sound pressure level
L_CF	9.6	fast C-weighted sound pressure level
L_CS	9.7	slow C-weighted sound pressure level
L_d	9.20	day average sound level
L_d	9.55	vibratory displacement level
L_den	9.25	community noise equivalent level
L_DF	9.8	fast D-weighted sound pressure level
L_dn	9.24	day-night average sound level
L_DS	9.9	slow D-weighted sound pressure level
L_d12	9.21	daytime average sound level
L_e	8.5	echo level
L_E	9.59	sound energy level
L_ev	9.22	evening average sound level
L_F	9.56	vibratory force level
L_i	8.4	incident sound pressure level of signal
L_I	9.57	sound intensity level
L_if	8.6	incident sound pressure spectrum level of signal
L_j	9.53.1	vibratory jerk level

Table 11—Alphabetical list of quantity symbols (*continued*)

Symbol	Item	Quantity
L_{MD}	8.23	minimum detectable signal level
L_{n}	9.23	night average sound level
L_{N}	8.7	sound pressure level of noise, self-noise level
	9.49	impact-sound pressure level
L_{N}	10.4	calculated loudness level
L_{Nf}	8.8	sound pressure spectrum level of noise
L_{Nn}	9.49.1	normalized impact-sound pressure level
L_{NP}	9.28	noise pollution level
L_{p}	9.1	sound pressure level in a stated frequency band
L_{P}	9.12	sound power level
$L_{P\,\mathrm{A}}$	9.13	A-weighted sound power level
$L_{p\,\mathrm{b}}$	9.11.1	band pressure level
L_{PN}	10.6	perceived noise level
L_{PNE}	10.10	effective perceived noise level
L_{PNeq}	10.11	equivalent continuous perceived noise level
L_{PNmax}	10.7	maximum perceived noise level
L_{PNT}	10.8	tone-corrected perceived noise level
L_{PNTmax}	10.9	maximum tone-corrected perceived noise level
$L_{p\,\mathrm{s}}$	9.15	sound pressure spectrum level
L_{r}	9.35	sound rating level
L_{R}	8.15	reverberation level
L_{S}	8.1	source level
L_{Sf}	8.2	source spectrum level
L_{v}	9.54	vibratory velocity level
L_{v}	4.32	luminance
L_{W}	9.12	sound power level
L_{w}	9.58	sound energy density level
$L_{W\,\mathrm{A}}$	9.13	A-weighted sound power level
L_{λ}	10.2	judged loudness level
L_{1h}	9.18	hourly average sound level
$L_{1/1}$	9.10	octave-band sound pressure level
$L_{1/3}$	9.11	one-third-octave-band sound pressure level
L_{8h}	9.19	8-h average sound level
L_{10}	9.27	fast A-weighted sound level exceeded 10% of time
m	2.1	mass
	5.46	number of phases
	6.90	flare coefficient of a horn
m_{a}	6.38	acoustic mass, acoustic inertance
m_{m}	6.47	dynamic mass
m_{r}	6.56	rotational inertance
M	2.8	moment of a force
	2.9	torque
	4.15	radiant exitance
	4.33	luminous exitance
	5.35	magnetization

Table 11—Alphabetical list of quantity symbols (*continued*)

Symbol	Item	Quantity
	6.104	Mach number
M_{a}	9.48	airborne sound insulation margin
M_{e}	4.15	radiant exitance
M_{i}	9.52	impact protection margin
M_I	7.25	short-circuit current response to pressure in coupler
M_{Ip}	7.26	short-circuit current response to pressure in sound field
M_{Iv}	7.27	short-circuit current response to particle velocity in sound field
M_P	7.28	power response to pressure in coupler
M_{pI}	7.17	pressure response in sound field to current
M_{pP}	7.20	pressure response in sound field to power
M_{Pp}	7.29	power response to pressure in sound field
M_{pU}	7.14	pressure response in sound field to voltage
M_{Pv}	7.30	power response to particle velocity in sound field
M_U	7.22	open-circuit voltage response to pressure in coupler
M_{Up}	7.23	open-circuit voltage response to pressure in sound field
M_{Uv}	7.24	open-circuit voltage response to particle velocity in sound field
M_{v}	4.33	luminous exitance
M_{vI}	7.18	particle velocity response in sound field to current

Symbol	Item	Quantity
M_{vP}	7.21	particle velocity response in sound field to power
M_{vU}	7.15	particle velocity response in sound field to voltage
M_y, M_{yx}	7.12	general symbols for response of transducer
n	1.19	speed of rotation, rotational frequency
	4.44	refractive index
	5.45	number of turns
	5.47	turns ratio
	6.78	index of refraction
	10.5	noisiness
n_{ij}	6.78	index of refraction
n_*	5.47	turns ratio
N	5.45	number of turns
	9.61	frequency level
	10.3	calculated loudness
N_{AG}	6.103	array gain
N_{attn}	8.11	attenuation loss
N_{BW}	8.9	bandwidth level correction
N_{D}	8.3	sonar dome loss
N_{DI}	6.100	directivity index
N_{DT}	8.19	detection threshold
N_{FM}	8.26	figure of merit
N_{M}	8.25	design margin
N_{p}	8.20	signal processing gain
N_{RI}	6.102	reverberation index
N_{RS}	8.16	reverberation strength

Table 11—Alphabetical list of quantity symbols (*continued*)

Symbol	Item	Quantity
N_{S}	8.13	multiple ray path gain, summation gain
N_{SD}	8.22	signal differential for recognition
N_{SE}	8.24	signal excess
N_{spr}	8.10	spreading loss
N_{T}	8.21	thresholding loss
N_{TS}	8.14	target strength
N_{W}	8.12	propagation loss, transmission loss
N_{WS}	8.17	wake strength
N_{δ}	6.96	angular deviation loss
$N_{\delta\mathrm{R}}$	6.98	receiver deviation loss
$N_{\delta\mathrm{T}}$	6.97	transmitter deviation loss
$N_{\theta\phi}$	6.96	angular deviation loss
NA	4.51	numerical aperture
p	2.3	momentum
	2.10	pressure
	6.2	sound pressure
p_{f}	6.4	spectral sound pressure
p_{f}^2	6.3	sound pressure spectral density
p_{I}	6.5	pressure impulse
p_{If}	6.7	spectral pressure impulse
p_{If}^2	6.6	pressure impulse spectral density, pressure impulse spectrum density
p_{s}	6.1	static pressure
P	2.25	power
	4.10	radiant power, radiant energy flux

Symbol	Item	Quantity
	5.53	permeance
	5.62	active power
	6.26	sound power
P_{m}	5.53	permeance
P_{Q}	5.63	reactive power
P_{S}	5.64	apparent power
q	6.19	volume velocity
q_{f}	6.21	spectral volume velocity
q_{f}^2	6.20	volume velocity spectral density
Q	4.7	radiant energy
	5.1	electric charge, quantity of electricity
	5.58	quality factor
	5.63	reactive power
Q_{e}	4.7	radiant energy
Q_{o}	6.23	strength of a simple source
r	1.7	radius, distance from source
R	1.7	radius, distance from source
	5.48	electrical resistance
	5.52	reluctance
	6.86	room constant
	9.38	sound transmission loss, sound insulation (of a partition)
R_{a}	6.36	acoustic resistance
R_{f}	6.88	specific flow resistance
R_{m}	5.52	reluctance

Table 11—Alphabetical list of quantity symbols (*continued*)

Symbol	Item	Quantity
	6.45	mechanical resistance
R_r	6.54	rotational resistance
s	1.9	length of path, line segment distance
	6.8	linear displacement
	6.64	condensation
S	1.13	area
	5.64	apparent power
$\boldsymbol{S}$	2.16	strain tensor
S_I	7.16	pressure response in coupler to current
$\boldsymbol{S}_{ii}$	2.14	linear strain
$\boldsymbol{S}_{ij}$	2.15	shear strain
S_P	7.19	pressure response in coupler to power
S_U	7.13	pressure response in coupler to voltage
S_x	7.12	general symbol for response of transducer
t	1.15	time
	3.2	temperature, Celsius temperature
	6.77	amplitude transmission coefficient
T	1.16	period, time of one cycle
	1.17	time constant
	2.9	torque
	2.23.2	kinetic energy
	3.1	absolute temperature, thermodynamic temperature
	6.81	reverberation time

Symbol	Item	Quantity
$\boldsymbol{T}$	2.13	stress tensor
$\boldsymbol{T}_{ii}$	2.11	normal stress
$\boldsymbol{T}_{ij}$	2.12	shear stress
T_{Ip}	7.25	short-circuit current response to pressure in coupler
T_{pI}	7.16	pressure response in coupler to current
T_{pP}	7.19	pressure response in coupler to power
T_{Pp}	7.28	power response to pressure in coupler
T_{pU}	7.13	pressure response in coupler to voltage
T_{Up}	7.22	open-circuit voltage response to pressure in coupler
T_{yx}	7.12	general symbol for response of transducer
T_{60}	6.81	reverberation time
u	6.13	sound particle velocity
u_f	6.15	spectral sound particle velocity
u_f^2	6.14	sound particle velocity spectral density
U	4.7	radiant energy
	5.8	voltage, electromotive force
	6.19	volume velocity
U_f	6.21	spectral volume velocity
U_f^2	6.20	volume velocity spectral density
v	1.14	volume
	1.24	velocity

Table 11—Alphabetical list of quantity symbols (*continued*)

Symbol	Item	Quantity
	6.13	sound particle velocity
v_f	6.15	spectral sound particle velocity
v_f^2	6.14	sound particle velocity spectral density
V	1.14	volume
	2.23.1	potential energy
	5.6	electrostatic potential, potential difference
	5.8	voltage, electromotive force
	6.22	volume displacement
w	2.24	energy density
	6.28	sound energy density
W	2.22	work
	2.23	energy
	4.7	radiant energy
	6.26	sound power
x	6.8	linear displacement
X	5.55	electric reactance
X_a	6.37	acoustic reactance
X_m	6.46	mechanical reactance
X_r	6.55	rotational reactance
Y	5.59	electrical admittance
	6.87	porosity
Y_a	6.40	acoustic admittance
Y_c	7.9	electrical admittance of clamped transducer
Y_{ec}	7.9	electrical admittance of clamped transducer
Y_{ef}	7.7	electrical admittance of transducer in vacuo
Y_{em}	7.11	motional admittance
Y_f	7.7	electrical admittance of transducer in vacuo
Y_m	6.49	mechanical admittance, mobility
	7.11	motional admittance
Y_r	6.58	rotational admittance
Y_s	6.34	specific acoustic admittance
z	6.32	characteristic impedance of a medium
Z	5.54	electrical impedance
Z_a	6.35	acoustic impedance
Z_c	6.32	characteristic impedance of a medium
	7.8	electrical impedance of clamped transducer
Z_{ec}	7.8	electrical impedance of clamped transducer
Z_{ef}	7.6	electrical impedance of transducer in vacuo
Z_{em}	7.10	motional impedance
Z_f	7.6	electrical impedance of transducer in vacuo
Z_m	6.44	mechanical impedance
	7.10	motional impedance
Z_{ph}	7.5	transfer impedance of projector and hydrophone
Z_r	6.53	rotational impedance
Z_s	6.33	specific acoustic impedance
α	1.1	lane angle

Table 11—Alphabetical list of quantity symbols (*continued*)

Symbol	Item	Quantity
	1.23	angular acceleration
	1.30	attenuation coefficient
	4.40.1	spectral absorption factor, spectral absorptance
	5.47.1	transformer ratio
	6.16	sound particle acceleration
	6.70	attenuation coefficient
	6.80	statistical absorption coefficient, random incidence energy absorption coefficient
α_f	6.18	spectral sound particle acceleration
α_f^2	6.17	sound particle acceleration spectral density
α_Sab	6.83	Sabine absorption coefficient
α_θ	6.79	absorption coefficient at incidence angle
β	1.1	plane angle
	1.31	phase coefficient
	6.66	coefficient of nonlinearity
	6.71	phase coefficient
γ	1.1	plane angle
	1.32	propagation coefficient
	2.15	shear strain
	3.14.3	ratio of specific heat capacities
	5.51	conductivity
	6.72	propagation coefficient
	6.99	directivity factor

Symbol	Item	Quantity
Γ	6.95	relative field frequency response
δ	1.6	thickness
	1.28	damping coefficient
	6.69	damping coefficient, decay rate
Δ	6.67	dilatation
$\Delta L_\mathrm{S/N}$	8.18	signal-to-noise differential, signal differential
$\Delta\theta_3$	6.91	beam width at -3 dB
$\Delta\theta_6$	6.92	beam width at -6 dB
$\Delta\theta_{10}$	6.93	beam width at -10 dB
$\Delta\theta_\infty$	6.94	beam width between first nulls
ε	2.14	linear strain
	2.16	strain tensor
	4.21.1	emissivity
	5.11	capacitivity, permittivity, absolute permittivity
	6.104	Mach number
ε_{ii}	2.14	linear strain
ε_{ij}	2.15	shear strain
ε_r	5.12	relative capacitivity, relative permittivity, dielectric constant
ζ	6.73	field quantity dissipation coefficient
2ζ	6.73.1	energy dissipation coefficient
η	2.26	efficiency
	6.101	reverberation factor
θ	1.1	plane angle

Table 11—Alphabetical list of quantity symbols (*continued*)

Symbol	Item	Quantity
	2.17	volume strain
	3.2	temperature, Celsius temperature
	5.82	phase angle, phase difference
	6.67	dilatation
θ_3	6.91	beam width at -3 dB
θ_6	6.92	beam width at -6 dB
θ_{10}	6.93	beam width at -10 dB
θ_∞	6.94	beam width between first nulls
Θ	3.1	absolute temperature, thermodynamic temperature
κ	5.12	relative capacitivity, relative permittivity, dielectric constant
λ	1.10	wavelength
	4.40.1	spectral absorption factor, spectral absorptance
	4.40.2	spectral reflection factor, spectral reflectance
	10.1	judged loudness
λ_c	5.78	critical wavelength, cutoff wavelength
λ_r	5.77	resonance wavelength
Λ	1.29	logarithmic decrement
	5.26	magnetic flux linkage
	6.65	parameter of nonlinearity
	6.68	logarithmic decrement
μ	2.18	Poisson's ratio
	5.29	magnetic permeability, absolute permeability
μ_r	5.30	relative permeability
ν	1.18	frequency
	2.18	Poisson's ratio
	6.85	collision frequency
ξ	6.10	sound particle displacement
ξ_f	6.12	spectral sound particle displacement
ξ_f^2	6.11	sound particle displacement spectral density
ξ_x	6.8	linear displacement
ρ	2.2	mass density
	4.40.2	spectral reflection factor, spectral reflectance
	5.49	resistivity, volume resistivity
	6.63	instantaneous density
	6.74	energy reflection coefficient
ρ_e	5.49	resistivity, volume resistivity
ρ_o	6.62	average density
σ	2.11	normal stress
	2.13	stress tensor
	5.3	surface density of charge
	5.51	conductivity
	6.89	flow resistivity
	9.28	standard deviation
σ_e	5.51	conductivity
σ_{ii}	2.11	normal stress
σ_{ij}	2.12	shear stress

Table 11—Alphabetical list of quantity symbols (*continued*)

Symbol	Item	Quantity
τ	1.17	time constant
	2.12	shear stress
	6.76	energy transmission coefficient
ϕ	1.1	plane angle
	5.6	electrostatic potential, potential difference
	5.82	phase angle, phase difference
	6.9	rotational displacement
	6.24	velocity potential
Φ	4.10	radiant power, radiant energy flux
	4.30	luminous flux
	5.24	magnetic flux
Φ_e	4.10	radiant power, radiant energy flux
Φ_v	4.30	luminous flux
ψ	1.1	plane angle
	6.73.1	energy dissipation coefficient
ω	1.2	solid angle
	1.20	angular frequency
	1.21	angular velocity
ω_c	5.76	critical angular frequency, cutoff angular frequency
ω_r	5.75	resonance angular frequency
ω_o	5.76.2	geometric midband angular frequency
ω_1, ω_2	5.76.1	cutoff angular frequencies
Ω	1.2	solid angle

Table 12—Alphabetical list of abbreviations

Abbre-viation	Item	Quantity
AI	10.19	articulation index
APWL	9.13	A-weighted sound power level
ASEL	9.26	A-weighted sound exposure level
BNC	9.33.1	balanced noise criterion
BSPL	9.11.1	band pressure level
CDR	10.25	composite damage risk
CNEL	9.25	community noise equivalent level
CNR	10.14	composite noise rating
D	9.39	noise reduction
DL	9.20	day average sound level
DNL	9.24	day-night average sound level
DT	8.18	detection threshold
DTL	9.21	daytime average sound level
EDRL	10.24	effective damage risk level
EL	8.5	echo level
	9.22	evening average sound level
EPNL	10.10	effective perceived noise level
FA	9.2	fast A-weighted sound level
FB	9.4	fast B-weighted sound level
FC	9.6	fast C-weighted sound level
FD	9.8	fast D-weighted sound level

Abbre-viation	Item	Quantity
FOM	8.26	figure of merit
FSTC	9.44	field sound transmission class
FTL	9.42	field transmission loss
RL	8.15	reverberation level
HL	10.20	hearing level
IAL	9.16	impulse A-weighted sound level
IIC	9.50	impact isolation class
	9.50.1	impact insulation class
IL	8.4	incident sound pressure level of signal
	9.57	sound intensity level
LL	10.4	calculated loudness level
LR	9.40	level reduction
MDS	8.23	minimum detectable signal level
MXAL	9.29	maximum A-weighted sound level
MXPNL	10.7	maximum perceived noise level
MXTPNL	10.9	maximum tone-corrected perceived noise level
NC	9.33	noise criterion level
NEF	10.13	noise exposure forecast
NIC	9.46	noise isolation class
NIHL	10.21	noise-induced hearing loss
NIPTS	10.22	noise-induced permanent threshold shift
NL	8.7	self-noise level
	9.23	night average sound level

Table 12—Alphabetical list of abbreviations (*continued*)

Abbre-viation	Item	Quantity
NNI	9.31	noise and number index
NNIC	9.47	normalized noise isolation class
NPL	9.28	noise pollution level
NR	9.33.3	noise rating
	9.39	noise reduction
OBSPL	9.10	octave-band sound pressure level
PKAL	9.30	peak A-weighted sound level
PNC	9.34	preferred frequency noise criterion level
PNL	10.6	perceived noise level
PNR	9.14	product noise rating
PSIL	10.16	preferred frequency speech interference level
PSL	9.15	sound pressure spectrum level
PWL	9.12	sound power level
QPNL	10.11	equivalent continuous perceived noise level
RC	9.33.2	room criterion
RL	8.15	reverberation level
RS	8.16	reverberation strength
SA	9.3	slow A-weighted sound level
SB	9.5	slow B-weighted sound level
SC	9.7	slow C-weighted sound level
SD	9.9	slow D-weighted sound level
SE	8.24	signal excess
SEL	9.26	A-weighted sound exposure level
SI	10.18	speech intelligibility
SIL	10.15	speech interference level
SIL (0.5–4)	10.17	speech interference level by ANSI S3.14-1977 [B2]
SL	8.1	source level
SLD	9.41	sound level difference
SLN	9.37	ARI sound level number
SPL	9.1	sound pressure level
SRN	9.36	ARI sound rating number
STC	9.43	sound transmission class
TAL	9.17	time average A-weighted sound level
	9.17.1	time interval equivalent continuous sound level
TL	8.12	transmission loss
	9.38	sound transmission loss
TNI	9.32	traffic noise index
TOBSPL	9.11	one-third-octave-band sound pressure level
TPNL	10.8	tone-corrected perceived noise level
TS	8.14	target strength
TTS2	10.23	temporary threshold shift 2 min after cessation of noise
VAL	9.53	vibratory acceleration level
VDL	9.55	vibratory displacement level
VFL	9.56	vibratory force level

Table 12—Alphabetical list of abbreviations (*continued*)

Abbre-viation	Item	Quantity
VJL	9.53.1	vibratory jerk level
VVL	9.54	vibratory velocity level
WEPNL	10.12	weighted equivalent continuous perceived noise level
WS	8.17	wake strength
1HL	9.18	hourly average sound level
8HAL	9.19.1	8-h average A-weighted sound level
8HL	9.19	8-h average sound level

Table 13—Index of quantities

Table 13—Index of quantities (*continued*)

Quantity	Item
class, field sound transmission	9.44
class, impact isolation	9.50
class, noise isolation	9.46
class, noise isolation, normalized	9.47
class, sound transmission	9.43
clipping loss	8.21
coefficient of absorption at incidence angle θ	6.79
coefficient of absorption at random incidence	6.80
coefficient of absorption, Sabine	6.83
coefficient of absorption, statistical	6.80
coefficient of amplitude reflection	6.75
coefficient of amplitude transmission	6.77
coefficient of attenuation	1.30, 6.70
coefficient of damping	1.28, 6.69
coefficient of energy dissipation	6.73
coefficient of energy reflection	6.74
coefficient of energy transmission	6.76
coefficient of flare of a horn	6.90
coefficient of nonlinearity	6.66
coefficient of phase	1.31, 6.71
coefficient of propagation	1.32, 6.72
collision frequency	6.85
community noise equivalent level	9.25
compliance, acoustic	6.43
compliance, mechanical	6.52
compliance, rotational	6.61
composite damage risk	10.25
composite noise rating	10.14
condensation	6.64
conductance, acoustic	6.41
conductance, electric	5.50
conductance, mechanical	6.50
conductance, rotational	6.59
conductivity	5.51
constant, dielectric	5.12
constant, magnetic	5.35
constant, room	6.86
correction for bandwidth	8.9
coupler response, open-circuit voltage to pressure	7.22
coupler response, power to pressure	7.28
coupler response, pressure to current	7.16
coupler response, pressure to power	7.19
coupler response, pressure to voltage	7.13
coupler response, short-circuit current to pressure	7.25
criterion level, noise	9.34
criterion level, noise, preferred frequency	9.33
critical angular frequency	5.76
critical frequency	5.74
critical wavelength	5.78
current, electric	5.18
current, particle velocity response to, in sound field	7.18
current, pressure response to, in coupler	7.16
current, pressure response to, in sound field	7.17
current response to particle velocity in sound field	7.27
current response to pressure in coupler	7.25
current response to pressure in sound field	7.26
cutoff angular frequencies	5.76.1
cutoff angular frequency	5.76
cutoff frequencies	5.74.1
cutoff frequency	5.74
cutoff wavelength	5.78
cylindrical waves, reciprocity parameter for	7.2
damage risk, composite	10.25
damage risk level, effective	10.24
damping coefficient	1.28, 6.69
day average sound level	9.20
day-night average sound level	9.24
daytime average sound level	9.21
decay rate	6.69
decrement, logarithmic	1.29, 6.68
density, average mass	6.62
density, electric flux	5.10
density, energy (volume)	2.24
density, instantaneous	6.63
density, magnetic flux	5.25
density, mass	2.2
density, sound energy	6.28
density, sound energy, level of	9.58
density, surface, of charge	5.3
design margin	8.25
detectable signal level, minimum	8.23
detection threshold	8.19
deviation loss, angular	6.96
deviation loss, receiver	6.98
deviation loss, transmitter	6.97
deviation, standard	9.28
dielectric constant	5.12
difference, phase	5.82
difference, potential	5.6
difference, sound level	9.41
differential, signal-to-noise	8.18
differential for recognition	8.22
diffuse sound, reciprocity parameter for	7.4
dilatation	6.67
directivity factor	6.99
directivity index	6.100
displacement, electric	5.10
displacement level, vibratory	9.55
displacement, linear	6.8
displacement, rotational	6.9
displacement, sound particle	6.10

Table 13—Index of quantities (*continued*)

Table 13—Index of quantities (*continued*)

Table 13—Index of quantities (*continued*)

Quantity	Item	Quantity	Item
linear displacement	6.8	mechanical reactance	6.46
linear strain	2.14	mechanical resistance	6.45
line segment	1.9	mechanical stiffness	6.48
linkage, magnetic flux	5.26	mechanical susceptance	6.51
logarithmic decrement	1.29, 6.68	merit, figure of	8.26
loss, angular deviation	6.96	midband angular frequency	5.76.2
loss, angular deviation, receiver	6.98	midband frequency	5.74.2
loss, angular deviation, transmitter	6.97	minimum detectable signal level	8.23
loss, attenuation	8.11	mobility	6.49
loss, field transmission	9.42	modulus, bulk	2.21
loss, propagation	8.12	modulus, of elasticity	2.19
loss, sonar dome	8.3	modulus, of rigidity	2.20
loss, sound transmission	9.38	moment of force	2.8
loss, spreading	8.10	moment of inertia	2.4
loss, thresholding	8.21	moment, second axial of area	2.5
loss, transmission in water	8.12	moment, second polar of area	2.6
loudness, calculated	10.3	momentum	2.3
loudness, judged	10.1	motional admittance	7.11
loudness level, calculated	10.4	motional impedance	7.10
loudness level, judged	10.2	multiple ray path gain	8.13
luminance	4.32		
luminous efficacy	4.36.1	night average sound level	9.23
luminous exitance	4.33	noise-bandwidth level correction	8.9
luminous flux	4.30	noise, community, equivalent level	9.25
luminous intensity	4.29	noise criterion level	9.33
		noise criterion level, preferred frequency	9.34
Mach number	6.104	noise criterion, balanced	9.33.1
magnetic constant	5.35	noise exposure—See sound exposure	
magnetic field strength	5.21	noise exposure forecast	10.13
magnetic flux	5.24	noise index, traffic	9.32
magnetic flux density	5.25	noise-induced hearing loss	10.21
magnetic flux linkage	5.26	noise-induced permanent threshold shift	10.22
magnetic induction	5.25	noise isolation class	9.46
magnetic permeability	5.29	noise isolation class, normalized	9.47
magnetic permeability, relative	5.30	noise level, effective perceived	10.10
magnetization	5.35	noise level, equivalent continuous perceived	10.11
magnetomotive force	5.23		
margin, airborne sound insulation	9.48	noise level, maximum tone-corrected perceived	10.9
margin, design	8.25		
margin, impact protection	9.52	noise level, perceived	10.6
mass	2.1	noise level, self-noise	8.7
mass, acoustic	6.38	noise level, tone-corrected perceived	10.8
mass density	2.2	noise level, maximum perceived	10.7
mass density, average	6.62	noise level, weighted equivalent continuous perceived	10.12
mass, dynamic	6.47		
maximum A-weighted sound level	9.29	noise and number index	9.31
maximum perceived noise level	10.7	noise pollution level	9.28
maximum tone-corrected perceived noise level	10.9	noise rating	9.33.3
		noise rating, composite	10.14
mean free path	6.84	noise rating, product	9.14
mechanical admittance	6.49	noise reduction	9.39
mechanical compliance	6.52	noise, sound pressure level of	8.7
mechanical conductance	6.50	noise, sound pressure spectrum level of	8.8
mechanical impedance	6.44	noise spectrum level, self-noise	8.8

Table 13—Index of quantities (*continued*)

Table 13—Index of quantities (*continued*)

Quantity	Item
pressure level of noise	8.7
pressure level, normalized impact-sound	9.49.1
pressure level of signal	8.4
pressure level, sound—See sound pressure level	
pressure response in coupler to current	7.16
pressure response in coupler to power	7.19
pressure response in coupler to voltage	7.13
pressure response in field to current	7.17
pressure response in field to power	7.20
pressure response in field to voltage	7.14
pressure, sound	6.2
pressure spectral density, sound	6.3
pressure, spectral sound	6.4
pressure spectrum density, sound	6.3
pressure spectrum level	9.15
pressure spectrum level of noise	8.8
pressure spectrum level of signal	8.6
pressure, static	6.1
processing gain	8.20
product noise rating	9.14
propagation coefficient	1.32, 6.72
propagation loss	8.12
protection margin, impact	9.52
quality factor	5.58
quantity of electricity	5.1
radiant energy	4.7
radiant energy flux	4.10
radiant exitance	4.15
radiant intensity	4.13
radiant power	4.10
radius	1.7
random incidence energy absorption coefficient	6.80
rate of decay	6.69
rating, composite noise	10.14
rating, noise	9.33.3
rating number, ARI	9.36
rating sound level	9.14
ratio of specific heat capacities	3.14.3
ratio, transformer	5.47.1
ratio, turns	5.47
reactance, acoustic	6.37
reactance, electrical	5.55
reactance, mechanical	6.46
reactance, rotational	6.55
reactive factor	5.66
reactive power	5.63
receiver deviation loss	6.98
reciprocity parameter for cylindrical waves	7.2
reciprocity parameter for diffuse sound	7.4
reciprocity parameter for plane waves	7.3
reciprocity parameter for spherical waves	7.1
recognition differential	8.22
reduction, level	9.40
reduction, noise	9.39
reflection coefficient, amplitude	6.75
reflection coefficient, energy	6.74
refractive index	4.44, 6.78
relative capacivity	5.12
relative field quantity response	6.95
relative permeability	5.30
relative permittivity	5.12
reluctance	5.52
resistance, acoustic	6.36
resistance, electrical	5.48
resistance, mechanical	6.45
resistance, rotational	6.54
resistance, specific flow	6.88
resistivity	5.49
resistivity, flow	6.89
resistivity, volume	5.49
resonance angular frequency	5.75
resonance frequency	5.73
resonance wavelength	5.77
response of transducer, general symbol for	7.12
response, relative field quantity	6.95
response to current, particle velocity in sound field	7.18
response to current, pressure in coupler	7.16
response to current, pressure in sound field	7.17
response to particle velocity in sound field, open-circuit voltage	7.24
response to particle velocity in sound field, power	7.30
response to particle velocity in sound field, short-circuit current	7.27
response to power, particle velocity in sound field	7.21
response to power, pressure in coupler	7.19
response to power, pressure in sound field	7.20
response to pressure in coupler, open-circuit voltage	7.22
response to pressure in coupler, power	7.28
response to pressure in coupler, short-circuit current	7.25
response to pressure in sound field, open-circuit voltage	7.23
response to pressure in sound field, power	7.29
response to pressure in sound field, short-circuit current	7.26
response to voltage, particle velocity in sound field	7.15
response to voltage, pressure in coupler	7.13
response to voltage, pressure in sound field	7.14
reverberation factor	6.101

Table 13—Index of quantities (*continued*)

Table 13—Index of quantities (*continued*)

Table 13—Index of quantities (*continued*)