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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 4963-2007

**Acoustics -- Normal equal-loudness-level contours
(English Translation)**

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Foreword

This Standard equivalently adopted ISO 226:2003 Acoustics - Normal Equal-Loudness-Level Contours (English Edition).

This Standard replaced GB/T 4963-1985.

The differences between GB/T 4963-1985 and this Standard are as follows:

--- GB/T 4963-2007 equivalently adopted ISO 226: 2003, with 4 clauses and 3 annexes; GB/T 4963-1985 refers to ISO/R 226: 1961, with only 3 clauses and 1 annex. The capacity of the version referenced by GB/T 4963-2007 is much larger; and add substantial contents.

--- As far as the core content is concerned, GB/T 4963-2007 has a formula for deriving sound pressure level from loudness level:

There is also a formula for deriving loudness level from sound pressure level:

However, GB/T 4963-1985 only has a formula for deriving the loudness level from the sound pressure level:

And the formula is also different.

--- The different formulas reflect that the equal loudness level contour of GB/T 4963-

2007 is compared with the equal loudness level contour of GB/T 4963-1985.

There are important changes between the frequency of 1000 Hz and 2000 Hz. It

is based on the recent 20~30 years' latest research results.

--- Annex C of GB/T 4963-2007 gives the origin of the standard equal loudness level contour. Together with the references, it lists the information of dozens of studies in more than a dozen countries, which can help standard users understand the relevant research methods.

This Standard equivalently translated ISO 226: 2003 and made the editorial changes.

This Standard's Annexes A and B are normative, while the Annex C is informative.

Acoustics - Normal Equal-Loudness-Level Contours

1 Scope

This International Standard specifies combinations of sound pressure levels and frequencies of pure continuous tones which are perceived as equally loud by human listeners. The specifications are based on the following conditions:

- a) the sound field in the absence of the listener consists of a free progressive plane wave;
- b) the source of sound is directly in front of the listener;
- c) the sound signals are pure tones;
- d) the sound pressure level is measured at the position where the centre of the listener's head would be, but in the absence of the listener;
- e) listening is binaural;
- f) the listeners are otologically normal persons in the age range from 18 years to 25 years inclusive.

The data are given in graphical form in Annex A and in numerical form in Annex B for the preferred frequencies in the one-third-octave series from 20 Hz to 12 500 Hz, inclusive, in accordance with GB/T 3240-1982.

2 Normative References

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties

who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 3240-1982 Preferred Frequencies for the Acoustical Measurement

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