



# Normal equal-loudness-level contours - *ISO 226:2003* Acoustics International Organization for Standardization (ISO) 2nd edition

See also: <http://www.lindos.co.uk/cgi-bin/FlexiData.cgi?SOURCE=Articles&VIEW=full&id=17>

[http://www.aist.go.jp/aist\\_e/latest\\_research/2003/20031114/20031114.html](http://www.aist.go.jp/aist_e/latest_research/2003/20031114/20031114.html)

[http://en.wikipedia.org/wiki/Fletcher-Munson\\_curves](http://en.wikipedia.org/wiki/Fletcher-Munson_curves)

[http://en.wikipedia.org/wiki/Robinson-Dadson\\_curves](http://en.wikipedia.org/wiki/Robinson-Dadson_curves)

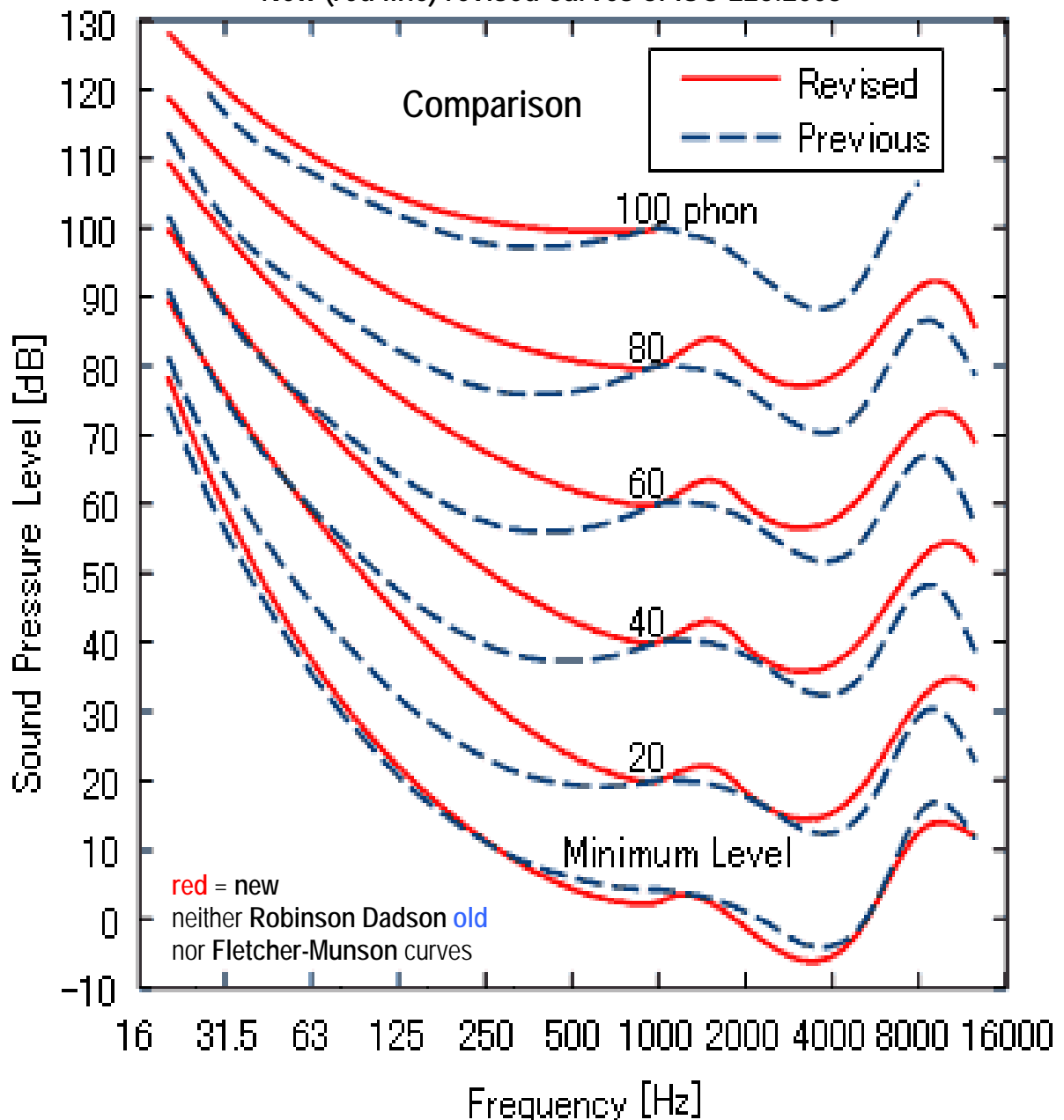
An **equal-loudness contour** is a measure of sound pressure, over the frequency spectrum, for which a listener perceives a constant loudness. The unit of measurement for loudness levels is the phon, and by definition two sine waves that have equal phons are equally loud.

Equal-loudness contours for listening in free sound fields are given in ISO 226-BS 3383. The specification for the minimum audible field in ISO 226 is the basis for sound field audiometry as described in ISO 8253-2. ISO 226 is currently being revised and as a result of discussion it was decided to split this standard into two parts - Reference thresholds of hearing under free-field and diffuse-field listening conditions and equal loudness level contours at high levels.

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: The sound field in the absence of the listener consists of a free progressive plane wave. The source of sound is directly in front of the listener. The sound signals are pure tones. 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 - listening is binaural. The listeners are ontologically normal persons in the age range from 18 years to 25 years inclusive.

The equal loudness level values are significantly higher than those of the old ISO 226, particularly below 1 kHz. For the differences to the previous (dashed blue line) version of ISO 226:1987 curves look at the

**New (red line) revised curves of ISO 226:2003**



Look at the much steeper curves in the bass (red) of the new *ISO 226:2003* standard.