INTERNATIONAL STANDARD 266

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Acoustics — Preferred frequencies for measurements

Acoustique — Fréquences normales pour les mesurages

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 43 has reviewed ISO Recommendation R 266 and found it technically suitable for transformation. International Standard ISO 266 therefore replaces ISO Recommendation R 266-1962 to which it is technically identical.

ISO Recommendation R 266 was approved by the Member Bodies of the following countries :

Australia	France	New Zealand
Austria	Germany	Sweden
Belgium	Hungary	Switzerland
Chile	India	United Kingdom
Denmark	Iran	U.S.A.
Finland	Netherlands	U.S.S.R.

No Member Body expressed disapproval of the Recommendation.

The Member Body of the following country disapproved the transformation of ISO/R 266 into an International Standard :

Germany

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0 INTRODUCTION

0.1 The variety of frequencies at present used for acoustical measurements makes comparison of results inconvenient. Some of the difficulties arise from the use of frequencies spaced at different intervals or of series starting from different reference frequencies. The purpose, therefore, of this International Standard is to refer all frequency-series to a single reference frequency, and to select other frequencies in such a way as to afford a maximum number of common frequencies in the various series. The resulting simplification thus reduces to a minimum the number of frequencies at which acoustical data need to be tabulated; equipment may be specifically constructed for these frequencies; even graph paper may be printed in advance.

0.2 Because many kinds of measuring equipment are in current use, it is inevitable that certain equipment will not conform to this International Standard; nor is it to be expected that existing equipment will be immediately discarded. This International Standard, however, provides a guide to future design and construction of apparatus and to the selection of the various frequencies in an orderly fashion.

0.3 The frequency of 1 000 Hz is of great importance in acoustics. For example, it is the reference frequency to the definition of the phon.[1] 1 000 Hz frequency has therefore been selected as the basic frequency for all series of preferred frequencies for acoustical measurements.

0.4 For certain kinds of acoustical measurements, it is convenient to space the frequencies by fractions of an octave; but for extensions into the infrasonic and ultrasonic ranges, it is convenient to use powers of 10. These two requirements are, strictly, incompatible. However, it has proved possible, without inconvenience, to use the $10^{1/10}$ series for calculating the entries in the table because of the fact that $2^{1/3}$ (= 1,259 9) is very nearly the same as $10^{1/10}$ (= 1,258 9), i.e. ten successive intervals in the 1/3 octave series may be accepted as a sufficient approximation to the preferred frequency ratio of 10. Practical considerations may also make some additional rounding desirable : thus 500 Hz is listed instead of 501,187, which is the exact frequency determined by the $10^{1/10}$ scale. The maximum individual deviation introduced is 1,22 %. All selected numerals comply with ISO 3, *Preferred numbers — Series of preferred numbers.* Where more precision is needed, the frequency may be computed from the formula :

$$10^{n/10}$$

where n is an integer, positive or negative.

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies preferred frequencies for acoustical measurements

For certain acoustical measurements, a constant frequency increment is a suitable spacing. More commonly, however, a constant percentage increment is adopted and the test frequencies then form a geometric series. This International Standard deals with the geometric series and is not intended to apply to cases where a constant frequency increment, or other particular spacing, would be more suitable, or where there may be good reasons for the adoption or retention of other frequencies.

This International Standard does not deal with frequencies for music.

1) See ISO/R 131, *Expression of the physical and subjective magnitudes of sound or noise.*