INTERNATIONAL STANDARD

ISO 8608

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Mechanical vibration — Road surface profiles — Reporting of measured data

Vibrations mécaniques — Profils de routes — Méthode de présentation des résultats de mesures

Reference number
ISO 8608:1995(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 8608 was prepared by Technical Committee ISO/TC 108, *Mechanical vibration and shock*, Subcommittee SC 2, *Measurement and evaluation of mechanical vibration and shock as applied to machines, vehicles and structures*.

Annexes A, B, C, D and E of this International Standard are for information only.

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Introduction

The purpose of this International Standard is to facilitate the compilation and comparison of measured vertical road profile data from various sources. It therefore specifies a uniform method of reporting data from one-track and multiple-track measurements.

It specifies how measurements shall be reported, but not how the measurements shall be made. The measuring equipment may influence the results of the measurement; therefore certain characteristics of the measuring system shall be reported.

Annex A is an example of a report which meets the minimum requirements of this International Standard.

Annex B gives means of approximately characterizing specific road profiles in order to facilitate the division of road profiles into general classifications. A general classification is also given. A curve-fitting method is suggested for characterizing spectral data.

Annex C provides general guidance for the use of road profile statistical data for simulation studies and for related studies such as evaluation of comfort, suspensions and road profiles.

Annex D discusses the processing of the Power Spectral Density (PSD) with the Fast Fourier Transform (FFT) technique. A discussion on the statistical precision is also given.

Mechanical vibration — Road surface profiles — Reporting of measured data

1 Scope

This International Standard specifies a uniform method of reporting measured vertical road profile data for either one-track or multiple-track measurements.

It applies to the reporting of measured vertical profile data taken on roads, streets and highways, and on off-road terrain. It does not apply to rail-track data. Measurement and processing equipment and methods are not included.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2041:1990, *Vibration and shock — Vocabulary.*

IEC 1260:—[1], *Electroacoustics — Octave-band and fractional-octave-band filters.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 2041 and the following definitions apply.

3.1 spatial frequency: Reciprocal of the wavelength. It is expressed in cycles per metre.

3.2 Power Spectral Density (PSD): The limiting mean-square value of a signal per unit frequency bandwidth. For a one-sided spectrum, the area located between the graphic plot and the horizontal axis in a linear plot should be equal to the variance (σ^2) of the original signal for the evaluated frequency range. This leads to a doubling of the spectral amplitude when the calculation process is only estimating the spectrum for positive frequencies.

3.3 displacement PSD: PSD of the vertical road profile displacement.

3.4 velocity PSD: PSD of the rate of change of the vertical road profile displacement per unit distance travelled (slope of the vertical road profile).

3.5 acceleration PSD: PSD of the rate of change of the slope of the vertical road profile per unit distance travelled.

3.6 decolouring: Procedure to eliminate the influence of the transfer function of the measuring system on the PSD, i.e. the raw PSD should be decoloured before any further processing by dividing it by the square of the modulus of the measuring equipment transfer function.

3.7 smoothing: An averaging process in which a data block is shifted and averaged.

NOTE 1 In this International Standard "unsmoothed PSD" means the PSD as calculated from the measured data, i.e. with the bandwidths used in or following from the calculations and which are different from those indicated in table 2. The term "smoothed PSD" is the PSD which is obtained after using the averaging process described in 5.1.2.

1) To be published. (Revision of IEC 225:1966)