

Method for

Reporting measured vibration data for land vehicles

[ISO title: Mechanical vibrations — Land vehicles — Method for
reporting measured data]

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the General Mechanical Engineering Standards Committee (GME/-) to Technical Committee GME/21, upon which the following bodies were represented:

- British Internal Combustion Engine Manufacturers' Association
- British Ship Research Association
- British Steel Corporation
- Department of Trade and Industry (National Engineering Laboratory)
- Electricity Supply Industry in England and Wales
- Engineering Equipment and Materials Users' Association
- Institute of Sound and Vibration Research
- Institution of Electronic and Radio Engineers
- Institution of Mechanical Engineers
- Ministry of Defence
- Motor Industry Research Association
- Power Generation Association (BEAMA Ltd.)
- Society of British Aerospace Companies Limited
- Society of Environmental Engineers
- United Kingdom Atomic Energy Authority

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National foreword

This British Standard has been prepared under the direction of the General Mechanical Engineering Standards Committee. It is identical with ISO 8002:1986 “*Mechanical vibrations — Land vehicles — Method for reporting measured data*” which was prepared by Technical Committee ISO/TC 108 of the International Organization for Standardization (ISO) and in the development of which the UK played an active part.

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words “International Standard” appear, referring to this standard, they should be read as “British Standard”.

Cross-references

International Standard	Corresponding British Standard
ISO 5008:1979	BS 6055:1981 <i>Methods for measurement of whole-body vibration of the operators of agricultural wheeled tractors and machinery</i> (Identical)
IEC Publication 225:1966	BS 2475:1964 <i>Octave and one-third octave band-pass filters</i> (Technically equivalent)

ISO 4865, to which reference is made in the text, is currently in preparation, and until it is published, terminology given in ISO 2041 should be sufficient for the purposes of this standard.

The Technical Committee has reviewed the provisions of ISO 2041, ISO 2631 and ISO 5349, to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard. A related British Standard to ISO 2041 is BS 3015:1976 “*Glossary of terms relating to mechanical vibration and shock*”. Two further British Standards related to ISO 2631 and ISO 5349 are currently in preparation.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

0 Introduction

It is often useful to compare and/or to compile measured vibration data from various sources. These endeavours are more difficult when the data are presented in different forms, such as constant bandwidth r.m.s. curves (of various bandwidths), proportional bandwidth curves, or power spectral density (PSD) curves, sometimes on linear scales and sometimes on logarithmic scales. Tedious and time-consuming mathematical transformation and replotting are therefore necessary, and this introduces the risk of errors.

This International Standard specifies, a uniform method for reporting data to facilitate comparing and compiling data.

The results of a measurement of random vibration are an estimate based on a sample. This International Standard specifies the analysis parameters to be reported so that the statistical precision of the reported data can be determined.

The measured vibration on land vehicles is a function both of the vehicle and of external factors, such as the operating conditions and the road or terrain profile. For work machines, the operating conditions are the machine work cycle and may vary considerably between segments of a specific work cycle. This International Standard specifies the reporting of the operating conditions, of the road or terrain conditions and of the work cycle (for work machines) as related to the reported vibration data. This information is necessary to assess and to compare data.

This International Standard emphasizes the need to include most of the relevant information on the curves or tables of results. The intent is to encourage putting details and results in a complete form on a few pages. This will facilitate compiling and comparing data and will facilitate international use of the data because the amount of translation necessary to identify the data will be reduced.

The purpose of this International Standard is to specify complete and uniform reporting of parameters, methods and results. It is not the purpose of this International Standard to specify any particular method to be used in the work itself.

An example which meets the minimum requirements of this International Standard is given in the annex.

1 Scope

This International Standard specifies a uniform method for reporting measured vibration data for all forms of land vehicles and work machines.

2 Field of application

This International Standard applies to reporting data to be used for certain types of structural testing of land vehicles and work machines or their components and to reporting data on vibration measured at the vehicle-occupant interface.

This International Standard applies to original reports of measured data and to reports or other publications which assess, summarize, compare or compile measured data from original reports.

It is not applicable to the reporting of any form of transfer function or other dynamic property of a system as derived from the measured data.

3 References

ISO 2041, *Vibration and shock — Vocabulary*.

ISO 2631, *Evaluation of human exposure to whole-body vibration*.

ISO 4865, *Vibration and shock — Methods for analysis and presentation of data*¹⁾.

ISO 5008, *Agricultural wheeled tractors and field machinery — Measurement of whole-body vibration to the operator*.

ISO 5349, *Guidelines for the measurement and the assessment of human exposure to hand-transmitted vibration*.

IEC Publication 225, *Octave, half-octave and third-octave band filters intended for the analysis of sounds and vibrations*.

4 Definitions

For the purposes of this International Standard, the terminology given in ISO 2041 and ISO 4865, and the following definitions apply.

4.1

detrending

any time domain process to reduce or remove frequency components the period of which is longer than the record length

4.2

land vehicle

a self-propelled device for carrying passengers, goods, or equipment, for example, car, bus, highway truck or train

4.3

magnitude window

the incremental range of magnitude of the time history, as used to calculate the probability functions (magnitude distributions) of vibration data

¹⁾ At present at the stage of draft.