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**Mechanical vibration and shock -- Evaluation of human
exposure to whole-body vibration -- Part 1: General
requirements**

(English Translation)

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Foreword

GB/T 13441 Mechanical Vibration and Shock - Evaluation of Human Exposure to Whole-Body

Vibration is divided into the following four parts:

- Part 1: General Vibration;
- Part 2: Vibration in Buildings (1Hz~80Hz);
- Part 4: Guidelines for the Evaluation of the Effects of Vibration and Rotational Motion on Passenger and Crew Comfort in Fixed-Guideway Transport Systems;
- Part 5: Method for Evaluation of Vibration Containing Multiple Shocks.

This Part is Part 1 of GB/T 13441.

This Part equivalently adopted ISO 2631-1:1997 (E) Mechanical Vibration and Shock - Evaluation of Human Exposure to Whole-Body Vibration - Part 1: General Requirements

(English Version).

For ease of use, this Part made the following editorial modifications:

- Use "this Part" to replace "this Part of ISO 2631";
- Delete the Foreword of the international standard;
- Use the decimal point "." to replace the comma "," that is used as the decimal point;
- Delete the Annex E; and combine the corresponding contents into the Bibliography;
- For the other international standards that are quoted by ISO 2631-1:1997 (E), some of which are equivalently adopted by Chinese standard, then they shall be replaced by the Chinese standard; while others are directly quoted the international standard.

This Part jointly revised GB/T 13441-1992 Specification for Measurement of Human Exposure

to Whole-Body Vibration Environment, and GB/T 13442-1992 Reduced Comfort Boundary and

Evaluation Criteria for Human Exposure to Whole-Body Vibration.

Compared with GB/T 13441-1992 and GB/T 13442-1992, the major changes of this Part are as

follows:

- The degree of consistency between this Part and ISO 2631-1: 1997(E) is equivalent, while the previous version is not equivalent;
- This Part is changed to Part 1 of the GB/T 13441 series of standards; and the parts not included in GB/T 13441-1992 and GB/T 13442-1992 are supplemented according to ISO 2631-1: 1997 (E);
- The frequency range extends below 1Hz and is evaluated using the acceleration frequency weighting method based on the root mean square value;
- Add Annex A: Mathematical definition of frequency weighting;
- Adjust terms and definitions;
- Cancel the concepts of vibration magnitude (vibration level), equivalent continuous root mean square value, equivalent continuous vibration level and etc. in GB/T 13441-1992;
- Cancel the measurement report in GB/T 13441-1992;

--- This Part does not emphasize the vibration exposure limit, nor the concept of exposure time. Cancel the contents related to exposure time in the tables and figures of GB/T 13442-1992; but add the guidance on the vibration impact assessment in Annexes B, C and D;

--- This Part not only specifies relevant measurement and evaluation methods for the impact of vibration on the sitting and standing human body, but also stipulates relevant measurement and evaluation methods for the impact of vibration on the lying human body; Annex C provides the guidance of the impact of vibration on comfort and perception.

This Part's Annex A is normative; while Annexes B, C and D are informative.

This Part was proposed by National Technical Committee on Mechanical Vibration and Shock

of Standardization Administration of China (SAC/TC 53).

Drafting organizations of this Part: Beijing Institute of Technology; Beijing Institute of Space Medico-Engineering; China Academy of Railway Sciences; Jilin Institute of Safety Science and

Technology; Beijing Municipal Institute of Labor Protection; and Zhengzhou Mechanical Engineering Research Institute.

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The historical editions replaced by this Standard are as follows:

--- GB/T 13441-1992;

--- GB/T 13442-1992.

Mechanical Vibration and Shock - Evaluation of Human
Exposure to Whole-Body Vibration - Part 1: General
Requirements

1 Scope

This Part defines methods for the measurement of periodic, random and transient whole-body

vibration. It indicates the principal factors that combine to determine the degree to which a vibration exposure will be acceptable. Informative annexes (Annexes B ~ D) indicate current opinion and provide guidance on the possible effects of vibration on health, comfort and perception and motion sickness. The frequency range considered is

- 0.5 Hz to 80 Hz for health, comfort and perception, and
- 0.1 Hz to 0.5 Hz for motion sickness.

Although the potential effects on human performance are not covered, most of the guidance on

whole-body vibration measurement also applies to this area. This part of ISO 2631 also defines

the principles of preferred methods of mounting transducers for determining human exposure.

It does not apply to the evaluation of extreme magnitude single shock such as occur in vehicle

accidents.

This Part is applicable to motions transmitted to the human body as a whole through the supporting surfaces: the feet of a standing person, the buttocks, back and feet of a seated person

or the supporting area of a recumbent person. This type of vibration is found in vehicles, in machinery, in buildings and in the vicinity of working machinery.

2 Normative References

The provisions in following documents become the provisions of this Part through reference in

this Part of GB/T 13441. 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