
INTERNATIONAL STANDARD



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Mechanical vibration of rotating and reciprocating machinery — Requirements for instruments for measuring vibration severity

*Vibrations mécaniques des machines tournantes ou alternatives —
Spécifications des appareils de mesure de
l'intensité vibratoire*

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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.

International Standard ISO 2954 was drawn up by Technical Committee ISO/TC 108, *Mechanical vibration and shock*, and circulated to the Member Bodies in January 1973.

It has been approved by the Member Bodies of the following countries :

Belgium	Italy	Sweden
Bulgaria	Japan	Thailand
Czechoslovakia	New Zealand	Turkey
Egypt, Arab Rep. of	Portugal	United Kingdom
France	Romania	U.S.A.
Germany	South Africa, Rep. of	U.S.S.R.

The Member Body of the following country expressed disapproval of the document on technical grounds :

Australia

Mechanical vibration of rotating and reciprocating machinery — Requirements for instruments for measuring vibration severity

1 SCOPE AND FIELD OF APPLICATION

This International Standard states the requirements which a measuring instrument for vibration severity of machines should meet if inaccuracies of measurement, particularly when making comparisons between one machine and another, are not to exceed a specific value. Instruments meeting the requirements of this International Standard are suitable for use in carrying out the procedures specified in ISO 2372 and ISO 2373 and are designated "Measuring instruments for vibration severity in rotating and reciprocating machines".

The instruments covered by this International Standard give direct indication or recording of root-mean-square vibration velocity, which is defined as the measuring unit of the vibration severity.

NOTES

1 A method of checking true root-mean-square indication is described in an annex.

2 Subject to limitation of the measuring-frequency range, these instruments may be used for other applications where similar accuracy of measurement is required, for example measurement of vibration velocity of structures, tunnels, bridges, etc.

2 DEFINITIONS

The terms used in this International Standard are defined in the following IEC Publications and ISO International Standards :

IEC 184, *Methods for specifying the characteristics of electromechanical transducers for shock and vibration measurements*.

IEC 222, *Methods for specifying the characteristics of auxiliary equipment for shock and vibration measurement*.

ISO 2041, *Vibration and shock — Vocabulary*.

ISO 2372, *Mechanical vibration of machines with operating speeds from 10 to 200 rev/s — Basis for specifying evaluation standards*.

ISO 2373, *Mechanical vibration of certain rotating electrical machinery with shaft heights between 80 and 400 mm — Measurement and evaluation of the vibration severity*.

3 GENERAL REQUIREMENTS

A vibration measuring instrument usually consists of : a vibration pickup; an indicator set which contains an amplifier, correcting filter networks for the frequency response and an indicating or recording instrument; and a power supply system.

The requirements described in this clause apply to the general characteristics of the complete assembly of the pickup and the true v_{rms} indicator set. Clauses 4 and 5 contain the detailed requirements for each of these main units.

3.1 The frequency range of the vibration severity measuring instrument shall be from 10 to 1 000 Hz.

NOTE — This means that the frequency range corresponds to the frequency interval employed in the evaluation scale in ISO 2372.

3.2 The sensitivity within the measuring-frequency range shall not deviate from the reference sensitivity at 80 Hz by more than the quantities given in the table.

TABLE — Sensitivity relative to the reference sensitivity at 80 Hz and limiting values of the permissible deviation within the frequency interval from 1 to 10 000 Hz

Frequency Hz	Relative sensitivity		
	Nominal value	Minimum value	Maximum value
1	—	—	0,01
2,5	0,016	0,01	0,025
10	1,0	0,8	1,1
20	1,0	0,9	1,1
40	1,0	0,9	1,1
80	1,0	1,0	1,0
160	1,0	0,9	1,1
500	1,0	0,9	1,1
1 000	1,0	0,8	1,1
4 000	0,016	0,01	0,025
10 000	—	—	0,01

To minimize measurement errors caused by the interference due to vibrations with frequencies outside the measuring-frequency range, the sensitivity shall decrease