INTERNATIONAL STANDARD

ISO 2954

Second edition
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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 — Exigences relatives aux 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 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 2954 was prepared by Technical Committee ISO/TC 108, *Mechanical vibration, shock and condition monitoring*, Subcommittee SC 3, *Use and calibration of vibration and shock measuring instruments*.

This second edition cancels and replaces the first edition (ISO 2954:1975), which has been technically revised.

The main changes are:

— Filters defined as standardized third-order Butterworth filters.

— The standard now covers other frequency ranges than 10 Hz to 1 000 Hz.

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

1 Scope

This International Standard specifies requirements which it is necessary for a measuring instrument for vibration severity of machines to meet if inaccuracies of measurement made on the casing of machines, particularly when making repeated measurements for trend monitoring of a certain machine, are not to exceed a specific value.
The instruments covered by this International Standard give direct indication or recording of root-mean-square (r.m.s.) vibration velocity that is defined as a measurement unit.

NOTE 1 A method of checking true r.m.s. indication is described in Annex A. This method is mainly retained for instruments not based on modern analogue to digital conversion and numerical calculation of r.m.s., but can also be applied to instruments which are so based.

NOTE 2 Subject to adaptation of the measurement frequency range, these instruments can be used for other applications where similar accuracy of measurement is required, measurement of vibration velocity of structures, tunnels, bridges, etc. Optionally phase measurements may be included.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2041, *Mechanical vibration, shock and condition monitoring — Vocabulary*

ISO 10816-1:1995, *Mechanical vibration — Evaluation of machine vibration by measurements on non-rotating parts — Part 1: General guidelines*

ISO 10816-6:1995, *Mechanical vibration — Evaluation of machine vibration by measurements on non-rotating parts — Part 6: Reciprocating machines with power ratings above 100 kW*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2041 apply.

4 Measurement quantities

The measurement quantities given in Table 1 are used to describe mechanical vibration of non-rotating parts.

Integration and differentiation among the measurement quantities is allowed both for broad band and discrete frequency component signals (see ISO 10816-1:1995, Annex A).

The maximum measured vibration magnitude is called vibration severity. It can be given a severity grade (see e.g. ISO 10816-6:1995, Table 1).

NOTE Formerly, vibration severity was normally only meant to be the maximum broad-band r.m.s. vibration velocity from 10 Hz to 1 000 Hz. This International Standard specifies the requirements for such a limited instrument, but also permits use of other frequency ranges.

The instrument should preferably be capable of measuring the measurement quantities given in Table 1, but shall at least measure r.m.s. vibration velocity over the frequency range defined in 5.3.