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# Condition monitoring and diagnostics of machines — Vibration condition monitoring —

## Part 1: General procedures

*Surveillance des conditions et diagnostic des machines — Surveillance relative aux conditions des vibrations —*

*Partie 1: Procédures générales*



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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 3.

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 part of ISO 13373 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13373-1 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*.

ISO 13373 consists of the following parts, under the general title *Condition monitoring and diagnostics of machines — Vibration condition monitoring*:

- *Part 1: General procedures*
- *Part 2: Data processing, analysis, diagnostics, display and general vibration*

Annexes A, B, C and D of this part of ISO 13373 are for information only.

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## Introduction

The principal purpose of vibration condition monitoring of machinery is to provide information on the operating condition of the machine for protection and predictive maintenance. An integral part of this process is the evaluation of the vibratory condition of the machine over operating time. The purpose of this part of ISO 13373 is to promote the use of well-accepted guidelines for acquiring and evaluating vibration measurements for condition monitoring.

In contrast to vibration testing used strictly for diagnostic or acceptance purposes, condition monitoring involves the acquisition of data which can be compared over a span of time, and emphasizes the changes in vibration behaviour rather than any particular behaviour by itself.

Changes in vibration behaviour may typically be caused by

- changes in balance,
- changes in alignment,
- wear of or damage to journals or anti-friction bearings,
- gear or coupling defects,
- cracks in the critical components,
- operational transients,
- fluid-flow disturbances in hydraulic machinery,
- transient excitations in electric machinery,
- rubbing, and
- mechanical looseness.

Vibration condition monitoring can provide information for the following purposes:

- to increase equipment protection;
- to improve safety for personnel;
- to improve maintenance procedures;
- to detect problems early;
- to avoid catastrophic failures;
- to extend equipment life;
- to enhance operations.

Vibration measurements for condition monitoring may take many forms from the very simple to the very complex, and can include continuous or periodic measurements. However, they all share the common goal of accurately and reliably assessing the condition of machinery. The instrumentation and procedures recommended in this part of ISO 13373 will assist in achieving that goal.

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The measurement methods described in this part of ISO 13373 reflect current common methods of measurements utilizing seismic and non-contacting vibration transducers. However, it is recognized that other methods of assessing the vibration condition of machines are in development. Although not included at this time, this part of ISO 13373 does not preclude the use of such measurement techniques.

ISO/TC 108 is at present also in the process of developing new International Standards on the subject of Machinery Diagnostics. These International Standards are intended to provide guidance on the overall monitoring of the "health" of machines, including factors such as vibration, tribology, oil purity and thermography.