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**Rolling bearings — Measuring  
methods for vibration —**

**Part 2:  
Radial ball bearings with cylindrical  
bore and outside surface**

*Roulements — Méthodes de mesure des vibrations —*

*Partie 2: Roulements à billes radiaux, à alésage et surface  
extérieure cylindriques*



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# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Measurement process</b> .....	<b>1</b>
4.1 Rotational frequency.....	1
4.2 Bearing axial load.....	1
<b>5 Measurement and evaluation methods</b> .....	<b>2</b>
5.1 Physical quantity measured.....	2
5.2 Frequency domain.....	2
5.3 Measurement of pulses and spikes.....	3
5.4 Measurement.....	3
<b>6 Conditions for measurement</b> .....	<b>3</b>
6.1 Bearing conditions for measurement.....	3
6.1.1 Prelubricated bearings.....	3
6.1.2 Non-prelubricated bearings.....	3
6.2 Conditions of the measurement environment.....	4
6.3 Conditions for the measuring device.....	4
6.3.1 Stiffness of the spindle/mandrel arrangement.....	4
6.3.2 Loading mechanism.....	4
6.3.3 Magnitude and alignment of the external load applied to the bearing.....	4
6.3.4 Axial location of the transducer and direction of measurement.....	5
6.3.5 Mandrel.....	6
<b>Annex A (normative) Measurement of external axial loading alignment</b> .....	<b>7</b>

## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 4, *Rolling bearings*.

This second edition cancels and replaces the first edition (ISO 15242-2:2004), which has been technically revised. It also incorporates the Technical Corrigendum ISO 15242-2:2004/Cor 1:2010.

ISO 15242 consists of the following parts, under the general title *Rolling bearings — Measuring methods for vibration*:

- *Part 1: Fundamentals*
- *Part 2: Radial ball bearings with cylindrical bore and outside surface*
- *Part 3: Radial spherical and tapered roller bearings with cylindrical bore and outside surface*
- *Part 4: Radial cylindrical roller bearings with cylindrical bore and outside surface*

## Introduction

Vibration in rotating rolling bearings can be of importance as an operating characteristic of such bearings. The vibration can affect the performance of the mechanical system incorporating the bearing and can result in audible noise when the vibration is transmitted to the environment in which the mechanical system operates, can lead to damages, and can even create health problems.

Vibration of rotating rolling bearings is a complex physical phenomenon dependent on the conditions of operation. Measuring the vibration of an individual bearing under a certain set of conditions does not necessarily characterize the vibration under a different set of conditions or when the bearing becomes part of a larger assembly. Assessment of the audible sound generated by the mechanical system incorporating the bearing is further complicated by the influence of the interface conditions, the location and orientation of the sensing device, and the acoustical environment in which the system operates. Assessment of airborne noise that, for the purpose of this document, can be defined as any disagreeable and undesired sound, is further complicated by the subjective nature of the terms *disagreeable* and *undesired*. Structure-borne vibration can be considered the driving mechanism that ultimately results in the generation of airborne noise. Only selected methods for the measurement of the structure-borne vibration of rotating rolling bearings are addressed in the current edition of ISO 15242.

Vibration of rotating rolling bearings can be assessed by a number of means using various types of transducers and measurement conditions. No simple set of values characterizing the vibration of a bearing is adequate for the evaluation of the vibratory performance in all possible applications. Ultimately, a knowledge of the type of bearing, its application and the purpose of the vibration measurement (e.g. as a manufacturing process diagnostic or an assessment of product quality) is required to select the most suitable method for measuring. The field of application for standards on bearing vibration is therefore not universal. However, certain methods have established a wide enough level of application to be considered as standard methods.

This part of ISO 15242 serves to define the detailed method for assessing vibration of radial ball bearings with cylindrical bore and outside surface on a measuring device.



# Rolling bearings — Measuring methods for vibration —

## Part 2:

## Radial ball bearings with cylindrical bore and outside surface

### 1 Scope

This part of ISO 15242 specifies vibration measuring methods for single-row and double-row radial ball bearings, with a contact angle up to and including 45°.

It covers radial ball bearings with cylindrical bore and outside surface, except bearings with filling slots and three- and four-point-contact ball bearings.

### 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 286-2, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*

ISO 2041:2009, *Mechanical vibration, shock and condition monitoring — Vocabulary*

ISO 5593, *Rolling bearings — Vocabulary*

ISO 15242-1:2015, *Rolling bearings — Measuring methods for vibration — Part 1: Fundamentals*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2041, ISO 5593 and ISO 15242-1 apply.

### 4 Measurement process

#### 4.1 Rotational frequency

The default rotational frequency shall be 1 800 min<sup>-1</sup> (30 s<sup>-1</sup>). The tolerance shall be  $\pm \frac{1}{2}$  % of the nominal rotational frequency.

Other rotational frequencies and tolerances may be used by agreement between the manufacturer and the customer, for example, it may be necessary to use a higher rotational frequency for bearings in the smaller size range (e.g. 3 600 min<sup>-1</sup>) in order to obtain an adequate vibration signal. Conversely, it may be necessary to use a lower rotational frequency for bearings in the larger size range (e.g. 700 min<sup>-1</sup>) to avoid possible ball and raceway damage.

#### 4.2 Bearing axial load

The bearing load shall be in the axial direction with default values as specified in [Table 1](#).