

---

---

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

**Part 3:  
Radial spherical and tapered roller  
bearings with cylindrical bore and  
outside surface**

*Roulements — Méthodes de mesurage des vibrations —*

*Partie 3: Roulements à rotule sur rouleaux et à rouleaux coniques, à  
alésage et surface extérieure cylindriques*

ISO 15242-3:2017

<https://standards.iteh.ai/catalog/standards/iso/ea56fb82-a9c4-42b0-b9cc-c5676f66ea7c/iso-15242-3-2017>



iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

ISO 15242-3:2017

<https://standards.iteh.ai/catalog/standards/iso/ea56fb82-a9c4-42b0-b9cc-c5676f66ea7c/iso-15242-3-2017>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Ch. de Blandonnet 8 • CP 401  
CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
[copyright@iso.org](mailto:copyright@iso.org)  
[www.iso.org](http://www.iso.org)

# 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.....	2
<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>

ISO 15242-3:2017

<https://standards.iteh.ai/catalog/standards/iso/ea56fb82-a9c4-42b0-b9cc-c5676f66ea7c/iso-15242-3-2017>

## 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 voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 4, *Rolling bearings*.

This second edition cancels and replaces the first edition (ISO 15242-3:2006), which has been technically revised. It also incorporates the Technical Corrigendum ISO 15242-3:2006/Cor. 1:2010.

The main changes compared to the previous edition are as follows:

- editorial changes have been made for clarification and removal of inconsistencies;
- figure keys have been updated for clarification.

A list of all parts in the ISO 15242 series can be found on the ISO website.

## 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 ISO 15242 (all parts), 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 all parts 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 the 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 document serves to define the detailed method for assessing vibration of radial spherical and tapered roller bearings with cylindrical bore and outside surface on a measuring device.

[ISO 15242-3:2017](https://standards.iteh.ai/catalog/standards/iso/ea56fb82-a9c4-42b0-b9cc-c5676f66ea7c/iso-15242-3-2017)

<https://standards.iteh.ai/catalog/standards/iso/ea56fb82-a9c4-42b0-b9cc-c5676f66ea7c/iso-15242-3-2017>

