

Translated English of Chinese Standard JB/T10197-2011

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Record No: 33611-2011

INDUSTRY STANDARD

OF THE PEOPLE'S REPUBLIC OF CHINA

JB/T 10187-2011

Replacing JB/T 10187-2000

**Rolling bearings - Specifications for vibration
(velocity) of deep groove ball bearings**

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Issued on: August 15, 2011

Implemented on: November 01, 2011

**Issued by: Ministry of Industry and Information Technology of the
People's Republic of China**

Table of Contents

Foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	5
4 Group code	5
5 Measurement and assessment method	5
6 Technical requirements	5
7 Inspection rules	6
Annex A (Normative) Measurement Method for Vibration (Velocity) of Deep Groove Ball Bearings	11
Annex B (Normative) Measurement Method for Radial Run-out and Axial Run-out of Mandrel	14
Annex C (Normative) Measurement Method for Foundation Vibration of Testing Device	15

Foreword

This standard replaces JB/T 10187-2000 “Rolling bearings - Specifications for Vibration (Velocity) of Deep Groove Ball Bearings”.

Compared with JB/T 10187-2000, main changes of this standard are as follows:

- Application scope of the standard is extended to Group-2 and Group-3 clearance's deep groove ball bearings (Chapter 1 of this edition);
- Add the group code definitions of VF3 and VF4 (Chapter 4 of this edition);
- Add the vibration (velocity) peak-value limits VP3 and VP4 corresponding to group VF3 and VF4, and inner diameter of 3 mm ~ 60 mm (Table A of this edition);
- Add the measuring method for vibration (velocity) of deep groove ball bearings (Annex A of this edition);
- Add the measuring method for mandrels radial run-out and axial run-out (Annex B of this edition);
- Add the measuring method for foundation vibration of testing device (Annex C of this edition);
- Delete “Measuring method for vibration (velocity) of miniature deep groove ball bearing” (Annex A of edition 2000).

Annex A, annex B and annex C of this standard are normative.

This standard was proposed by China Machinery Industry Federation.

This standard shall be under the jurisdiction of National Technical Committee on Bearing of Standardization(SAC/TC98).

Drafting organizations of this standard: Hangzhou Bearing Test & Research Center Co., Ltd., C&U GROUP LTD., Zhejiang Tianma Bearing Co., Ltd., and Qianchao Bearing Co., Ltd.

Main drafters of this standard: Chen Fanghua, Wang Lanying, Yan Weizeng, Lai Zhigang, Zhang Tianping, Wang Jinhan, and Chen Yun.

The historical versions replaced by this standard is as follows:

- JB/T 10187-2000.

Rolling bearings - Specifications for Vibration (Velocity) of Deep Groove Ball Bearings

1 Scope

This standard specifies the specifications for vibration (velocity) of deep groove ball bearings (hereinafter referred as bearings) of which the appearance dimensions comply with provisions of GB/T 276-1994; diameter series are 0, 2 and 3; nominal inner diameter is 3 mm ~ 120 mm; radial clearances comply with Group 0, 2 and 3 clearances as specified in GB/T 4604-2006. And it specifies the vibration (velocity) peak-value specifications corresponding to Group V3 and V4, and the inner diameter is 3 mm ~ 60 mm.

Group V specified in this standard stands is the basic requirements to common bearing vibration (velocity). The bearing is not marked with "V". Group V1, V2, V3 and V4 are applicable to those bearings that have requirements to vibration (velocity). Group VF3 and VF4 are applicable to those bearings that have requirements to both vibration (velocity) and vibration (velocity) peak-value.

This standard is applicable to production inspection and user acceptance inspection for finished bearings by manufacturer.

2 Normative references

The articles contained in the following documents have become part of this standard when they are quoted herein. For the dated documents so quoted, all the modifications (excluding corrections) or revisions made thereafter shall not be applicable to this standard. For the undated documents so quoted, the latest editions shall be applicable to this standard.

GB/T 276-1994 Rolling bearings - Deep groove ball bearings - Boundary dimensions

GB/T 2828.1-2003 Sampling procedures for inspection by attribute – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

GB/T 3141-1994 Industrial liquid lubricants - ISO viscosity classification

GB/T 4604-2006 Rolling bearings - Radial internal clearance

GB/T 24610.1-2009 Rolling bearings - Measuring methods for vibration - Part 1: Fundamentals (ISO 15242-1 :2004, IDT)

GB/T 24610.2-2009 Rolling bearings - Measuring methods for vibration - Part 2:
Radial ball bearings with cylindrical bore and outside surface

JB/T 2974-2004 Rolling bearings - Identification code - Supplemental regulations

3 Terms and definitions

For the purpose of this standard, the following terms and definitions AND those defined in GB/T 24610.1-2009 apply.

3.1

Peak-value of rolling bearings vibration (velocity)

The maximum positive peak-value of bearing vibration (velocity) within a given time interval.

4 Group code

Following vibration group codes and the ones specified in JB/T 2974-2004 apply to this standard.

VF3: Vibration (speed) value reaches V3 and vibration (velocity) peak-value reaches VP3.

VF4: Vibration (speed) value reaches V4 and vibration (velocity) peak-value reaches VP4.

5 Measurement and assessment method

5.1 Assessment method follows the provisions in Annex A.

5.2 In accordance with specified measuring method, select three roughly equidistant positions on cylindrical outside surface of bearing outer ring in peripheral direction. During the test of certain measuring plane, arithmetic mean of vibrations at three positions of some frequency band is the vibration (velocity) value of the measuring plane for this frequency band of the bearing. Maximum vibration (velocity) peak-value at three positions of some frequency band is the vibration (velocity) peak-value of the measuring plane for this frequency band of the bearing. After both sides are tested, take the vibration (velocity) and vibration (velocity) peak-value of the larger side as the vibration (velocity) and vibration (velocity) peak-value for this frequency band of the bearing.

6 Technical requirements

6.1 For deep groove ball bearings of which the inner diameter is 3 mm ~ 60 mm, single bearing vibration (velocity) or vibration (velocity) peak-value of different groups shall comply with provisions in Table 1.

6.2 For deep groove ball bearings of which the inner diameter is 65 mm ~ 120 mm, single

A.3.3 Test procedures

A.3.3.1 Test procedures shall follow provisions in 5.4 of GB/T 24610.2-2009.

A.3.3.2 Test duration shall follow provisions in 6.5 of GB/T 24610.1-2009. If it cannot achieve a stable state within 5 min after the test is started, then the bearing shall be deemed and handled as an unqualified product.

Table A.2 Set frequency range

Rotating speed		Low Frequency (L)		Intermediate Frequency (M)		High Frequency (H)	
min	max	Set Frequency					
		f_{up}	f_{down}	f_{up}	f_{down}	f_{up}	f_{down}
r/min		Hz					
882	909	50	150	150	900	900	5 000
1 764	1 818	50	300	300	1 800	1 800	10 000

A.4 Measurement conditions

A.4.1 Bearing measurement conditions

Bearing measurement conditions shall follow provisions in 6.1 of GB/T 24610.2-2009. In case of any objection against the test results of non-pre-lubricated bearings, NY-120 solvent oil is used to clean effectively. Test results after sufficient lubrication for L-AN15 total loss system oil shall prevail after solvent oil volatilizes and becomes dry. NY-120 solvent oil shall not contain tetraethyl lead and shall be filtered through a filter of which the filtration precision is not less than 0.45 μm . L-AN15 total loss system oil shall be filtered through a filter of which the filtration precision is not less than 0.8 μm . Other technical requirements follow provisions of GB/T 3141-1994.

A.4.2 Testing environment and testing device conditions

A.4.2.1 Testing environment follows provisions in 6.2 of GB/T 24610.2-2009.

A.4.2.2 Stiffness and loading mechanism of spindle/mandrel shall follow provisions in 6.3.1 and 6.3.2 of GB/T 24610.2-2009. Radial run-out at the position where mandrel (after combining with spindle) matches up bearing bore diameter shall not be greater than 5 μm . Axial run-out of mandrel shoulder shall not be greater than 10 μm . The measurement method shall follow provisions in Annex B.

A.4.2.3 Foundation vibration of testing device shall not exceed provisions in Table A.3. The measuring method shall follow provisions in Annex C.

Table A.3 Foundation vibration of testing device

Nominal Inner Diameter of Bearing d		Foundation Vibration max.		
Exceeding	To	Low Frequency (L)	Intermediate Frequency (M)	High Frequency (H)
mm		$\mu\text{m/s}$		
3 ^a	15	10	7	4
15	60	12	10	5

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