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**Rolling bearings—Silicon nitride
balls**

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal for establishment of Japanese Industrial Standard by the Japan Bearing Industrial Association (JBIA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

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Rolling bearings — Silicon nitride balls

Introduction

This Japanese Industrial Standard has been made based on **JIS B 1501**, in order to specify requirements for balls for rolling bearings which are specifically made of the material given in **JIS R 1669**:2006.

No corresponding International Standard has been established at this point.

1 Scope

This Standard specifies silicon nitride balls for rolling bearings.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 0104 *Rolling bearings — Vocabulary*

JIS B 0124 *Rolling bearings — Symbols for quantities*

JIS B 0633 *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture*

JIS B 0651 *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Nominal characteristics of contact (stylus) instruments*

JIS B 1501 *Rolling bearings — Balls*

JIS B 1515-1 *Rolling bearings — Tolerances — Part 1: Terms and definitions*

JIS B 7451 *Instruments for the assessment of departure from roundness — Measurement of variations in radius*

JIS R 1669 *Fine ceramics — Fundamental characteristics and classification of silicon nitride materials for rolling bearing balls*

3 Terms, definitions and quality symbols

For the purpose of this Standard, the terms, definitions and quantity symbols given in **JIS B 0104**, **JIS B 0124**, **JIS B 1501** and **JIS B 1515-1** and the following apply.

3.1 silicon nitride balls

finished balls for rolling bearings, made of silicon nitride materials

3.2 nominal dimension

designation generally used to show that the diameter of silicon nitride balls is equal

The nominal dimensions and dimensions of silicon nitride balls are shown in table 1.

3.3 nominal ball diameter D_w

value that the nominal dimension is expressed in unit of mm

3.4 single ball diameter D_{ws}

distance between two parallel planes tangential to the actual surface of a silicon nitride ball

3.5 mean ball diameter D_{wm}

arithmetical mean value of the largest and the smallest single ball diameters of a silicone nitride ball

3.6 variation of ball diameter V_{Dws}

difference between the largest and the smallest single ball diameters of a silicone nitride ball

3.7 deviation from spherical form

on the spherical surface of a silicone nitride ball, radial difference between the smallest circumscribed sphere and the greatest inscribed sphere with their centres common to the least square sphere centre

3.8 waviness

random or periodical surface undulations from the ideal spherical form

3.9 surface roughness

surface irregularities with relatively small spacings resulting from the manufacturing method and/or other influences

The surface roughness shall be expressed by the arithmetical mean of roughness (Ra).

3.10 surface defect

flaw of the real surface, irregularity or group of them accidentally caused during manufacture, storage, handling or use

NOTE : These types of flaw or irregularity differ from those constituting the surface roughness and should not be considered during the measurement of the surface roughness.

3.11 ball lot

silicon nitride balls of definite quantity manufactured under conditions presumed uniform and treated as an entity

3.12 mean diameter of ball lot D_{wmL}

arithmetical mean value of the mean ball diameter of the largest silicone nitride ball and the mean ball diameter of the smallest silicone nitride ball in a ball lot

3.13 variation of ball lot diameter V_{DwL}

difference between the mean ball diameter of the largest silicone nitride ball and the mean ball diameter of the smallest silicone nitride ball in a ball lot

3.14 ball grade G

specific division according to dimension, form, surface roughness and allowable values of gauge interval (see table 2 and table 3)

NOTE : The ball grade shall be identified by the Latin letter G and Arabic numbers.