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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 44751-2024

**Fine ceramics - Silicon nitride materials for rolling bearing balls
and rollers**

精细陶瓷 滚动轴承球及滚子用氮化硅材料

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is modified to adopt ISO 26602:2017 "Fine ceramics (advanced ceramics, advanced technical ceramics) Silicon nitride for rolling bearing balls Material".

Compared with ISO 26602:2017, this document has many structural adjustments. The structural number changes between the two documents are shown in the table below.

See Appendix A.

This document has many technical differences compared to ISO 26602:2017.

A list of these technical differences and their causes is given in Appendix B.

The following editorial changes have been made to this document.

--- To coordinate with the existing standard, the name of the standard is changed to "Silicon Nitride Materials for Fine Ceramic Rolling Bearing Balls and Rollers";

--- Deleted Notes 1 and 2 in the scope of Chapter 1 of ISO 26602:2017;

--- Deleted the notes to 3.1 and 3.2 in ISO 26602:2017;

--- Added Appendix A (informative) "Comparison table of structure numbers between this document and ISO 26602:2017";

--- Added Appendix B (informative) "List of technical differences between this document and ISO 26602:2017 and their causes".

1 Scope

This document specifies the requirements for silicon nitride materials for rolling bearing balls and rollers.

This document defines the physical and mechanical properties of silicon nitride materials for rolling bearing balls and rollers.

Appendix C provides the methods for sample preparation and microstructure analysis.

This document applies to machined rolling bearing balls and rollers.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 6569 Fine Ceramics - Test Method for Flexural Strength (GB/T 6569-2006, ISO 14704:2016, MOD) GB/T 16534 Test method for room temperature hardness of fine ceramics (GB/T 16534-2009, ISO 14705:2016, MOD) GB/T 16535 Test method for linear thermal expansion coefficient of fine ceramics - Ejector pin method (GB/T 16535-2008, ISO 17562.

2016, MOD)

GB/T 17991 Terminology for Fine Ceramics (GB/T 17991-2009, ISO 20507:2022, MOD) GB/T 25995 Test method for density and apparent porosity of fine ceramics (GB/T 25995-2010, ISO 18754:2020, MOD) GB/T 40005 Weibull statistical analysis method for strength data of fine ceramics (GB/T 40005-2021, ISO 20501.

2019, MOD)

GB/T 41605-2022 Test method for fracture resistance of silicon nitride materials for rolling bearing balls at room temperature - Indentation method (GB/T 41605-2022, ISO 14627:2012, MOD) JC/T 2172 Test method for elastic modulus, shear modulus and Poisson's ratio of fine ceramics - Pulse excitation method

3 Terms and Definitions

For the purposes of this document, the terms and definitions defined in GB/T 17991 and GB/T 41605-2022 and the following apply.

KI, IFR

The ability of a material to resist crack growth caused by indentation.

[Source: GB/T 41605-2022, 3.1] 3.2 inclusion in silicon nitride ceramics for rolling bearing balls and rollers, agglomerates of sintering additives and components other than the normal Si₃N₄ impurities.