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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 14627 was prepared by Technical Committee ISO/TC 206, *Fine ceramics*.

Fine ceramics (advanced ceramics, advanced technical ceramics) — Test method for fracture resistance of silicon nitride materials for rolling bearing balls at room temperature by indentation fracture (IF) method

1 Scope

This International Standard describes a test method that covers the determination of fracture resistance of silicon nitride bearing balls at room temperature by the indentation fracture (IF) method, as specified in ISO 26602.

This International Standard is intended for use with monolithic silicon nitride ceramics for bearing balls. It does not include other ceramic materials.

This International Standard is for material comparison and quality assurance.

Indentation fracture resistance, $K_{I,IFR}$ as defined in this International Standard is not to be equated to fracture toughness determined using other test methods such as K_{Isc} and K_{Ipb} .

NOTE $K_{I,IFR}$ is an estimate of a material's resistance to cracking as introduced by an indenter and has correlations with wear resistance and rolling contact fatigue performance as well as machining processes used for silicon nitride materials since these properties are governed by the resistance to crack extension in localized damage areas. By contrast, fracture toughness, K_{Isc} and K_{Ipb} are intrinsic properties of a material and are relevant to macroscopic and catastrophic fracture events with long cracks, rather than those phenomena caused by microscopic and successive damage accumulation associated with short cracks.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4287:1997, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

ISO 6507-2:2005, *Metallic materials — Vickers hardness test — Part 2: Verification and calibration of testing machines*

ISO 6507-3:2005, *Metallic materials — Vickers hardness test — Part 3: Calibration of reference blocks*

ISO/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories*

ISO 17561:2002, *Fine ceramics (advanced ceramics, advanced technical ceramics) — Test method for elastic moduli of monolithic ceramics at room temperature by sonic resonance*

ISO 26602:2009, *Fine ceramics (advanced ceramics, advanced technical ceramics) — Silicon nitride materials for rolling bearing balls*

3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.