INTERNATIONAL STANDARD

ISO 3408-4

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Ball screws —

Part 4: Static axial rigidity

Vis à billes —

Partie 4: Rigidité axiale statique

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Contents

Page

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 3408-4 was prepared by Technical Committee ISO/TC 39, *Machine tools*.

ISO 3408 consists of the following parts, under the general title *Ball screws*:

— *Part 1: Vocabulary and designation*

— *Part 2: Nominal diameters and nominal leads — Metric series*

— *Part 3: Acceptance conditions and acceptance tests*

— *Part 4: Static axial rigidity*

— *Part 5: Static and dynamic axial load ratings and operational life*

Ball screws —

Part 4: Static axial rigidity

1 Scope

This part of ISO 3408 sets forth terms and mathematical relations relevant to the determination of the static axial rigidity of the ball screw.

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 3408-1:2006, *Ball screws — Part 1: Vocabulary and designation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3408-1 apply.

4 Symbols and subscripts

4.1 Symbols

Symbol	Description	Unit
α	Contact angle	degrees, °
ρ	Reciprocal curvature radius	mm^{-1}
τ	Ratio of the semi-major to the semi-minor axes of the contact ellipse	—
φ	Lead angle	degrees, °
Δl	Elastic deflection	µm
c_E	Material constant	—
c_k	Geometry factor	$N^{-2/3}$ µm
d_{bo}	Diameter of the deep hole bore	mm
d_c	Diameter of load application on the ball screw shaft	mm
D_c	Diameter of load application on the ball nut	mm
D_{pw}	Ball pitch circle diameter	mm
D_w	Ball diameter	mm
D_1	Outer diameter of ball nut	mm