Konstruktsioonilaagrid. Osa 4: Rull-laagrid

Structural bearings - Part 4: Roller bearings

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 1337-4:2004 sisaldab Euroopa standardi EN 1337-4:2004 ingliskeelset teksti. Käesolev dokument on jõustatud 27.07.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 1337-4:2004 consists of the English text of the European standard EN 1337-4:2004. This document is endorsed on 27.07.2004 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This part of EN 1337 specifies the requirements for the design and manufacture of single and multiple roller bearings, in which the roller axis is horizontal. In order to accommodate displacements parallel to the roller axis roller bearings can be combined with sliding elements in accordance with EN 1337-2. To permit rotation about the axis perpendicular to the roller axis or about both axes, as for multiple roller bearings, the roller bearings can be combined with bearings from other parts of EN 1337.	**Scope:** This part of EN 1337 specifies the requirements for the design and manufacture of single and multiple roller bearings, in which the roller axis is horizontal. In order to accommodate displacements parallel to the roller axis roller bearings can be combined with sliding elements in accordance with EN 1337-2. To permit rotation about the axis perpendicular to the roller axis or about both axes, as for multiple roller bearings, the roller bearings can be combined with bearings from other parts of EN 1337.

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Appareils d'appui structuraux - Partie 4: Appuis à rouleau

Lager im Bauwesen - Teil 4: Rollenlager

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 1337-4:2004) has been prepared by Technical Committee CEN /TC 167, "Structural bearings", the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2004, and conflicting national standards shall be withdrawn at the latest by January 2006.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

The European Standard EN 1337 “Structural bearings” consists of the following 11 parts:

Part 1 General design rules

Part 2 Sliding elements

Part 3 Elastomeric bearings

Part 4 Roller bearings

Part 5 Pot bearings

Part 6 Rocker bearings

Part 7 Spherical and cylindrical PTFE bearings

Part 8 Guide bearings and restrain bearings

Part 9 Protection

Part 10 Inspection and maintenance

Part 11 Transport, storage and installation

Annex A is normative and annex B is informative.

This document includes a Bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This part of EN 1337 specifies the requirements for the design and manufacture of single and multiple roller bearings, in which the roller axis is horizontal. In order to accommodate displacements parallel to the roller axis roller bearings can be combined with sliding elements in accordance with EN 1337-2. To permit rotation about the axis perpendicular to the roller axis or about both axes, as for multiple roller bearings, the roller bearings can be combined with bearings from other parts of EN 1337.

This part of EN 1337 does not apply to roller bearings made with materials other than those specified in clause 5.

Bearings which are subjected to rotation greater than 0,05 rad resulting from the characteristic combination of actions are outside the scope of this part of EN 1337.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 1337-1:2000, *Structural bearings — Part 1: General design rules.*

EN 1337-2:2004*, Structural bearings — Part 2: Sliding elements.*

EN 1337-7*; Structural bearings - Part 7: Spherical and cylindrical PTFE bearings.*

EN 1337-9:1997, *Structural bearings — Part 9: Protection.*

EN 1337-10, *Structural bearings — Part 10: Inspection and maintenance.*

EN 1990*; Eurocode - Basis of structural design.*

ENV 1992-1-1*; Eurocode 2: Design of concrete structures - Part 1: General rules and rules for buildings.*

ENV 1993-1-1; *Eurocode 3: Design of steel structures - Part 1-1: General rules and rules for buildings.*

EN 10025, *Hot rolled products of non-alloy structural steels — Technical delivery conditions.*

EN 10083-1, *Quenched and tempered steels — Part 1: Technical delivery conditions for special steels.*

EN 10083-2, *Quenched and tempered steels — Part 2: Technical delivery condition for unalloyed quality steels.*

EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip for general purposes.*

EN 10160, *Ultrasonic testing of steel flat product of thickness equal or greater than 6 mm (reflection method).*

EN 10204, *Metallic products — Types of inspection documents.*

EN ISO 4287; *Geometrical product specifications (GPS) - Surface texture: Profile method - Terms, definitions and surface texture parameters (ISO 4287:1997).*

EN ISO 6506-1, *Metallic materials - Brinell hardness test - Part 1: Test method (ISO 6506-1:1999).*

ISO 3755, *Cast carbon steels for general engineering purposes.*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1.1
roller bearing
bearing formed by an upper and lower plate separated by one or more rollers (see Figure 1)

3.1.2
roller
accurately machined component of a roller bearing with concentric cylindrical surfaces

3.1.3
roller plate
accurately machined flat component which transmits force to and from the roller and provides the surface on which the roller moves

3.1.4
supporting plate
plate intermediate between the roller plate and the structure

3.1.5
multiple roller bearing
bearing comprising more than one roller

3.1.6
rotation element
additional element required with multiple bearings in order to share the applied normal forces between the rollers

3.2 Symbols

For the purposes of this European Standard, the following symbols apply.

α_d total design angular rotation about the line of contact, in radians (rad)

b width of Hertzian contact area, in millimetres (mm)

E_d design modulus of elasticity, in Newtons per square millimetre (N/mm^2)

e_d total design eccentricity of vertical load, in millimetres (mm)

$e_{1,d}$ total eccentricity due to rolling friction, in millimetres (mm)

$e_{2,d}$ design eccentricity due to rotation, in millimetres (mm)

$e_{3,d}$ design eccentricity due to translation, in millimetres (mm)

D diameter of the roller at the contact surface, in millimetres (mm)

f_u ultimate strength of material, in Newtons per square millimetre (N/mm^2)

f_y yield strength of material, in Newtons per square millimetre (N/mm^2)

N_{Rd} design resistance of the roller plates in Newtons (N)

N'_{Rd} design resistance per unit length in Newton per millimetre (N/mm)

N_{RK} characteristic resistance of the roller plates

N'_{RK} characteristic resistance per unit length in Newton per millimetre (N/mm)

N_{Sd} design axial force, in Newtons (N)

N'_{Sd} design axial force per unit length in Newton per millimetre (N/mm)

γ_m partial material safety factor

L effective length of roller, in millimetres (mm)

M_{Sd} rotation moment, in Newton millimetres (Nmm)

R radius of contact surface, in millimetres (mm)

t_p thickness of roller plate, in millimetres (mm)

μ_d design coefficient of rolling friction

H distance between horizontal section to be verified and roller contact area in millimetres (mm)

V_{Sd} total transverse or shear force in Newtons (N)

3.3 Abbreviations

ULS Ultimate Limit State

NDP Nationally Determined Parametres

FPC Factory Production Control