

Konstruksioonilaagrid. Osa 4: Rull- laagrid

Structural bearings - Part 4: Roller bearings

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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

Structural bearings - Part 4: Roller bearings

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

Lager im Bauwesen - Teil 4: Rollenlager

This European Standard was approved by CEN on 2 February 2004.

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Contents

page

Foreword.....	4
1 Scope	5
2 Normative references	5
3 Terms, definitions and symbols	6
3.1 Terms and definitions	6
3.2 Symbols	6
3.3 Abbreviations	7
4 Functional requirements	8
4.1 General.....	8
4.2 Load bearing capacity	8
4.3 Rotation capability	9
5 Materials.....	9
5.1 General.....	9
5.2 Carbon steel	9
5.3 Stainless steel	9
5.4 Cast steel	9
6 Design	9
6.1 General.....	9
6.2 Movement	10
6.3 Curved surfaces.....	10
6.4 Surfaces in contact.....	10
6.5 Length of rollers.....	10
6.6 Guidance and security of rollers.....	10
6.7 Dimensioning of components	10
6.7.1 Dimension of roller	10
6.7.2 Dimensions of roller plates.....	11
6.7.3 Load distribution to other components.....	12
6.8 Particular requirements.....	12
6.8.1 Flat sided rollers	12
6.8.2 Multiple rollers.....	12
6.8.3 Corrosion in the contact line	12
6.8.4 Alignment of components.....	12
6.8.5 Alignment of bearings	12
6.9 Design coefficient of friction	12
6.10 Eccentricities.....	13
6.10.1 Single rollers	13
6.10.2 Eccentricity due to rotation moment of multiple rollers.....	13
6.10.3 Transverse eccentricity.....	14
6.10.4 Total eccentricity.....	14
6.11 Combination with other elements	14
7 Tolerances	14
7.1 Flatness.....	14
7.2 Surface profile.....	14
7.3 Surface roughness	14
7.4 Parallelism of contact surfaces	15
7.5 Diameter of multiple rollers	15
8 Conformity evaluation	15
8.1 General.....	15
8.2 Control of the construction product and its manufacture.....	15
8.2.1 Factory Production Control (FPC).....	15
8.2.2 Initial type testing	15

8.2.3	Routine testing.....	15
8.3	Raw materials and constituents.....	16
9	Installation	16
10	In-service inspection	16
Annex A (normative) Ferrous materials.....		18
Annex B (informative) Factory Production Control		19
B.1	General.....	19
B.1.1	Objectives.....	19
B.1.2	Documentation.....	19
B.1.3	Operations	19
B.2	Verifications and tests.....	20
B.2.1	General comments.....	20
B.2.2	Monitoring of conformity	20
B.2.3	Tests.....	20
B.2.4	Treatment of construction products which do not conform.....	20
B.2.5	Recording of verification and tests (manufacturer's register).....	20
B.2.6	Traceability.....	21
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Directive.....		22
ZA.1	Scope and relevant characteristics.....	22
ZA.2	Procedure(s) for attestation of conformity of roller bearings	24
ZA.2.1	System(s) of attestation of conformity	24
ZA.2.2	EC Certificate and declaration of conformity	28
ZA.3	CE marking and labelling	29
Bibliography		31

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