

# SLOVENSKI STANDARD

## SIST EN 1337-7:2001

01-april-2001

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Strukturni ležalniki - Del 7: Kroglasti in cilindrični PTFE ležalniki

Structural bearings - Part 7: Spherical and cylindrical PTFE bearings

Lager im Bauwesen - Teil 7: Kalotten- und Zylinderlager mit PTFE

Appareils d'appui structuraux - Partie 7: Appareils d'appui cylindriques et sphériques comportant du PTFE

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Ta slovenski standard je istoveten z: **EN 1337-7:2000**

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Technical aspects

**SIST EN 1337-7:2001**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN 1337-7

December 2000

ICS 91.010.30

English version

Structural bearings - Part 7: Spherical and cylindrical PTFE  
bearings

Appareils d'appui structuraux - Partie 7: Appareils d'appui  
cylindriques et sphériques comportant du PTFE

Lager im Bauwesen - Teil 7: Kalotten- und Zylinderlager mit  
PTFE

This European Standard was approved by CEN on 18 November 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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## Foreword

This European Standard 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 June 2001, and conflicting national standards shall be withdrawn at the latest by June 2001.

This 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

Further to CEN/TC 167's decision Part 1 and 2 form a package of standards and they come into force together, while the other parts come into force separately after the publication of Parts 1 and 2.

Annexes A, B and ZA are informative.

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

## Introduction

This standard considers a minimum operating temperature of  $-35^{\circ}\text{C}$ .

An extension down to  $-40^{\circ}\text{C}$  will be considered in a future amendment.

Applications beyond the range of temperature given in clause 1 need special consideration not covered by this standard. Characteristics, requirements and test procedures given in this standard do not apply in such cases.

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## 1 Scope

This European Standard deals with the requirements for the design and manufacture of spherical and cylindrical PTFE bearings. The requirements and properties of the curved sliding surfaces are included in EN 1337-2:2000. Spherical and cylindrical bearings with an included angle  $2\theta > 60^\circ$  and  $2\theta > 75^\circ$  respectively are beyond the scope of this European Standard. (see Figure 6).

For the purpose of controlling the degree of freedom the bearings may be combined with flat sliding elements and guides according to EN 1337-2:2000 and restraining rings as per 6.3.4.

Cylindrical bearings are susceptible to unexpected moments about the transverse axis of the cylindrical surface. Additional limitation of application to be taken into consideration is given in clause 1 of EN 1337-2:2000.

## 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 1337-2:2000      Structural bearings - Part 2: Sliding elements

prEN 1337-5:1996      Structural bearings - Part 5: Pot bearings

[SIST EN 1337-7:2001](https://standards.iteh.ai/catalog/standards/sist/3cf09e97-d2ea-46f2-a16f-ac0a9c3befe/sist-en-1337-7-2001)

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[ac0a9c3befe/sist-en-1337-7-2001](https://standards.iteh.ai/catalog/standards/sist/3cf09e97-d2ea-46f2-a16f-ac0a9c3befe/sist-en-1337-7-2001)

## 3 Terms and definitions, symbols and abbreviations

### 3.1 Terms and definitions

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

#### 3.1.1

##### **backing plate**

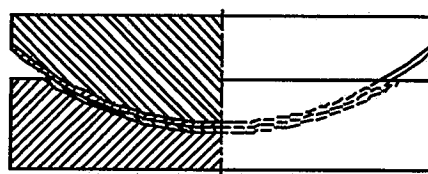
metallic component which supports sliding materials.

#### 3.1.2

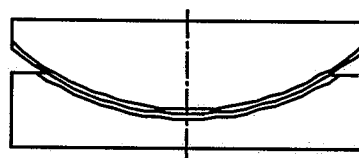
##### **cylindrical PTFE bearing**

bearing consisting of a backing plate with a convex cylindrical surface (rotational element) and a backing plate with a concave cylindrical surface between which a PTFE sheet and the mating material form a curved sliding surface (see Figure 1). Cylindrical PTFE bearings are also used in combination with flat sliding elements and guides to form free or guided bearings (see Figure 2).

**NOTE**      Numbers in brackets in Figures 1 and 2 refer to the examples shown in Figure 1 of EN 1337-1:2000.

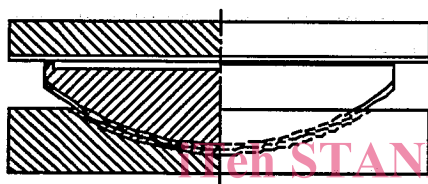


a) fixed by end stops and sliding surface (7.1)

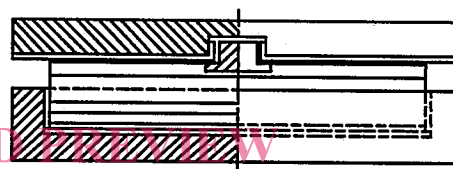


b) without end stops for displacements in y direction (7.2)

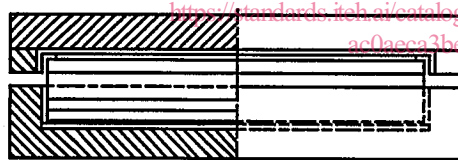
**Figure 1 - Cylindrical PTFE bearings**



a) free for displacements in any direction (7.4)



b) guided by an internal guide for displacements in x direction (7.3)



c) guided by external guides for displacements in x direction

**Figure 2 - Cylindrical PTFE bearings combined with flat sliding elements**



**3.1.3****guide**

sliding element which restrains a sliding bearing from moving in one axis.

**3.1.4****lubricant**

special grease used to reduce the friction and wear in the sliding surfaces.

**3.1.5****mating surface**

hard smooth metallic surface against which the PTFE slides.

**3.1.6****polytetrafluoroethylene (PTFE)**

a thermoplastic material used for its low coefficient of friction.

**3.1.7****sliding materials**

materials which form sliding surfaces.

**3.1.8****sliding surface**

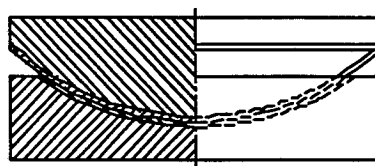
combination of a pair of flat or curved surfaces of different materials which allow relative displacements.

**3.1.9****spherical PTFE bearing**

bearing consisting of a backing plate with a convex spherical surface (rotational element) and a backing plate with a concave spherical surface between which a PTFE sheet and the mating material form a curved sliding surface (see Figure 3).

Spherical PTFE bearings are also used in combination with flat sliding elements and guides to form free and guided bearings (see Figures 4 a) to 4 c)). Spherical PTFE bearings combined with a flat sliding element can be used together with a restraining ring to form fixed bearings (see Figure 4 d)).

**NOTE** Numbers in brackets in Figures 3 and 4 refer to the examples shown in Figure 1 of EN 1337-1:2000.



**NOTE** Fixed by sliding surface (3.2).

**Figure 3 - Spherical PTFE bearing**

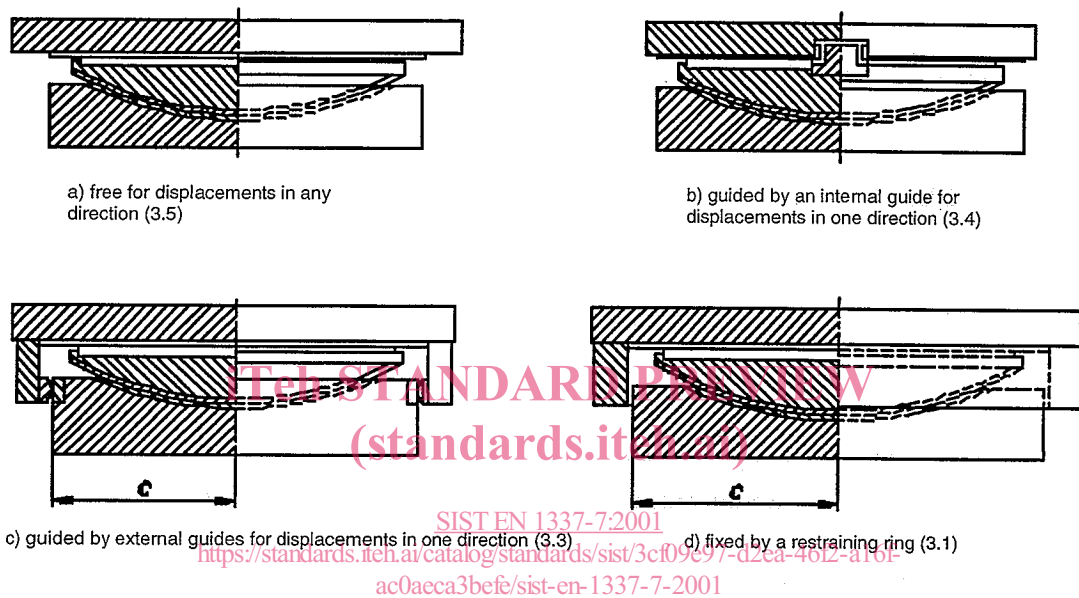


Figure 4 - Spherical PTFE bearings combined with flat sliding elements

### 3.2 Symbols

The most frequently occurring symbols are defined below. Those that are local, and unique to a particular clause, are defined at their first appearance.

#### 3.2.1 Latin upper case letters

A	contact area of sliding surface; projected area of the curved sliding surface	mm <sup>2</sup>
L	diameter or diagonal of the projected area of the PTFE sheet	mm

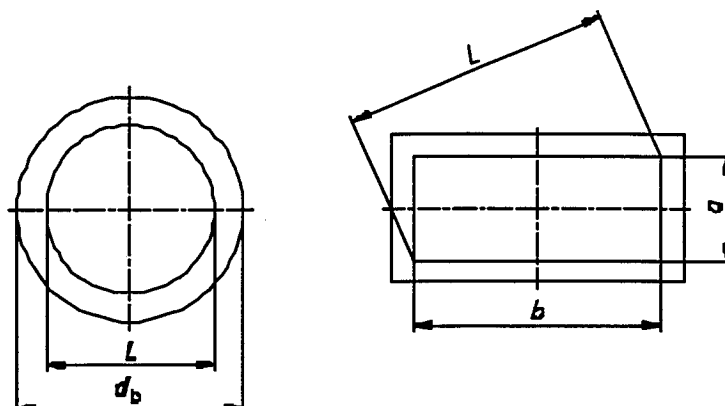


Figure 5 - Plan dimensions of spherical and cylindrical bearings

N	axial or normal force .....	N; kN
V	lateral or shear force .....	N; kN

### 3.2.2 Latin lower case letters

a	side of the projection in plan of rectangular PTFE surfaces .....	mm
b	as before; distance from the projected area of the curved sliding surface .....	mm
c	dimension .....	mm
d	diameter .....	mm
e	eccentricity .....	mm
f	nominal compressive strength .....	N/mm <sup>2</sup>
h	protrusion of PTFE sheet from its recess .....	mm
r	radius of curvature .....	mm
t	thickness .....	mm
x	longitudinal axis	
y	transverse axis	
z	axis normal to the principal bearing surface	

### 3.2.3 Greek letters

$\alpha$	rotation angle .....	radians
$\beta$	deviation angle from vertical axis of the line of action of the applied load .....	degrees, radians
$\Delta z$	maximum deviation of plane or curved sliding surfaces from theoretical surface .....	mm
$\theta$	half included angle of PTFE curved surfaces .....	degrees, radians
$\lambda$	ratio, coefficient	
$\mu$	coefficient of friction	
$\sigma$	normal pressure .....	N/mm <sup>2</sup>