BRITISH STANDARD

BS EN
1337-9 : 1998

Structural bearings

Part 9. Protection

The European Standard EN 1337-9 : 1997 has the status of a British Standard

ICS 91.010.30

National foreword

This British Standard is the English language version of EN 1337-9 : 1997, published by the European Committee for Standardization (CEN).

The UK participation in its preparation was entrusted to Technical Committee B/522, Structural bearings, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

The UK voted against this standard at the CEN Formal Vote stage, but the analysis of voting, in accordance with CEN/CENELEC Internal Regulations Part 2 : *Common rules for standards work*, resulted in a positive vote. In consequence, the document was accepted as a European Standard.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled 'International Standards Correspondence Index', or by using the 'Find' facility of the BSI Standards Electronic Catalogue.

Additional information

Contrary to the advice given in paragraph 4 of the European foreword, this Part will come into effect before Parts 1 and 2.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 6, an inside back cover and a back cover.

This British Standard, having been prepared under the direction of the Sector Board for Building and Civil Engineering, was published under the authority of the Standards Board and comes into effect on 15 March 1998

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EUROPEAN STANDARD
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EN 1337-9

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ICS 91.010.30

Descriptors: Civil engineering, bearing devices, protection, specifications, environments, dust, corrosion prevention, fire protection

English version

Structural bearings — Part 9: Protection

Appareils d'appui structuraux — Partie 9: Protection

Lager im Bauwesen — Teil 9: Schutz

This European Standard was approved by CEN on 24 October 1997.

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 Central Secretariat 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 Central Secretariat 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.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Ref. No. EN 1337-9 : 1997 E

Foreword

This European Standard has been prepared by Working Group 5 of Technical Committee CEN/TC 167, Structural bearings, the secretariat of which is held by UNI.

The European Standard prEN 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: *Guided bearings and restrained bearings*
Part 9: *Protection*
Part 10: *Inspection and maintenance*
Part 11: *Transport, storage and installation*

This Part 9 *Protection* includes annex A (informative).

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

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 May 1998, and conflicting national standards shall be withdrawn at the latest by May 1998.

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

Contents

1 Scope

This Part of this European Standard deals with the measures to protect structural bearings from the effects of the environment and other external influences which would reduce their working life.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate place 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.

ISO 2409 : 1992 *Paints and varnishes — Cross-cut test*

ISO 2808 : 1991 *Paints and varnishes — Determination of film thickness*

ISO 4628-1 : 1982 *Paints and varnishes — Evaluation of degradation of paint coatings — Designation of intensity, quantity and size of common types of defect —* Part 1: *General principles and rating schemes*

ISO 4628-2 : 1982 *Paints and vanishes — Evaluation of degradation of paint coatings — Designation of intensity, quantity and size of common types of defect —* Part 2: *Designation of degree of blistering*

ISo 4628-3 : 1982 *Paints and varnishes — Evaluation of degradation of paint coverings — Designation of intensity, quantity and size of common types of defect —* Part 3: *Designation of degree of rusting*

ISO 4628-4 : 1982 *Paints and varnishes — Evaluation of degradation of paint coatings — Designation of intensity, quantity and size of common types of defect —* Part 4: *Designation of degree of cracking*

ISO 4628-5 : 1982 *Paints and varnishes — Evaluation of degradation of paint coatings — Designation of intensity, quantity and size of common types of defect —* Part 5: *Designation of degree of flaking*

ISO 6272 : 1993 *Paints and varnishes — Falling — weight test*

ISO 7253 : 1996 *Paints and varnishes — Determination of resistance to neutral salt spray (fog)*

ISO 8501-1 : 1994 *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness —* Part 1: *Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings*

3 Definitions

For the purpose of this standard the following definitions apply:

3.1 accidental damage: Damage inflicted on the bearing from factors to which it is not intentionally exposed.

3.2 environmental damage: Damage caused by factors associated with the location in which the bearing is intended to function and which could be predicted at the time the bearing is installed.

3.3 marine environment: Location affected by sea salt spray and with an average zinc corrosion rate between 30 g/m^2 per annum and 60 g/m^2 per annum (as 99,9 % Zn).

3.4 protection against corrosion: Measures taken to prevent damage to the bearing due to the corrosion of all, or parts thereof, for a time period specified.

3.5 protective coating: Any coating applied to the bearing, or parts thereof, to protect them from environmental damage.

3.6 protective measures: Any measures taken to protect the bearing, or parts thereof, from the effects of the environment and other external causes, that would otherwise reduce its working life.

3.7 working life: The specified period for which a corrosion protection system will provide the minimum performance required by the standard or otherwise agreed.

4 General requirements

4.1 Protection against environmental influences

4.1.1 *Corrosion protection*

This clause specifies the corrosion protection requirements for the metallic components of structural bearings that would otherwise suffer environmental damage due to corrosion. It excludes surfaces subject to sliding, rolling, friction grip or local pressure.

4.1.1.1 *Performance*

The system for protection against corrosion qualified in accordance with this standard shall ensure that for a period of ten years after delivery the items meet the requirements detailed below, provided the bearings have been handled, stored and installed in accordance with this standard:

– No blistering density in excess of Grade 1 of ISO 4628-2.

– No rusting in excess of rust Grade Ri: 1 of ISO 4628-3.

– No breakdown of coating in excess of Class 1 of ISO 4628-4.

– No degree of flaking in excess of Class 1 of ISO 4628-5.

Where the bearing is to be installed in an environment more aggressive than a marine environment, alternative corrosion protection requirements may need to be agreed.

4.1.1.2 *Documentation*

To define the corrosion protection system, the following shall be documented:

– Manufacturers procedure for the corrosion protection of bearings;

– Material suppliers specifications;

– Tests.

The above shall include as a minimum the following:

– Standard of surface preparation (e.g. Sa 2½ in accordance with ISO 8501 Sa);

– Type of protective coating (e.g. sprayed zinc, two pack epoxy acrylated rubber);

– Number of coats;

– For paint systems:

– Item number and colour;

– Brand name and manufacturers reference number;

– Datasheet number;

– Where applied;

– How applied;

– Minimum dry film thickness;

– Maximum local dry film thickness;

– Procedures for treatment of local damage to protective coatings;

– Results of the tests according with table 1.

These tests shall be repeated every five years or whenever a change to the corrosion protection system is made.

4.2 Electrolytic corrosion

Where dissimilar metals are used, care shall be taken to avoid electrolytic corrosion.

5 Conformity evaluation

5.1 General

The tests and inspections specified in this clause shall be carried out to demonstrate the products conformity with this European Standard.

The tests and inspection are required under a production control scheme.

If and when in addition to production control, third party control is required, the type tests shall be performed prior to commencing the third party control.

Results of previous type tests are only valid if no changes in production have occurred which influence conformity to this European Standard.

When during third party audit testing, a non-conformance is detected, the audit test specified in this clause shall be repeated on a further sample. If a further non-conformance is detected, the causes of the non-conformity shall be traced and rectified. Documentary evidence that the non-compliance has been rectified shall be included in the manufacturer's records.

Table 1.

Test	Standard	Acceptance criteria
Neutral salt spray	ISO 7253	After: 720 hours;
		No blister in excess of Grade 1 of ISO 4628-2;
		No rust in excess of Ri 1 of ISO 4628-3;
		No breakdown in excess of Class 1 of ISO 4628-4;
		No flaking Class 1 in exess of ISO 4628-5.
Minimum dry film thickness	ISO 2808	As specified by the paint manufacturer
Cross-cut	ISO 2409	0 or 1
Falling-weight	ISO 6272	No visible damage with 1 kg ball and fall of 10 cm

5.2 Control of raw and constituent materials and components

The bearing manufacturer shall verify that the incoming raw and constituent materials and components have been subjected to a production control scheme (sampling tests, frequencies, etc.) and, if when required, to a third party control. The result of the verification shall be noted in the manufacturer's records.

The bearing manufacturer shall ensure that incoming raw and constituent materials and components are not used and processed (except in circumstances described below) until they have been verified as conforming.

Where incoming raw and constituent materials and components are released for urgent production purposes, they shall be positively identified and recorded in order to permit immediate recall and replacement in the event of non-conformance to specified requirements.

5.3 Control of finished product

The system for corrosion protection shall be subjected to test in accordance with table 1.

These tests shall be repeated every five years or whenever a change to the corrosion protection system is made.

Annex A (informative)
Recommendations

Structural bearings, properly designed and fabricated in accordance with the other Parts of this European Standard, can be expected to last for at least several decades and, in many cases, as long as the structure which they support. Their life can however be shortened considerably if they are not protected from the aggressive elements of the environment in which the structure they are supporting is situated.

When the environment is more aggressive than a marine environment, it is essential that the purchaser gives full details of the environment in which the bearing will be installed, describing any localized factors which may modify the general area affected.

Corrosion protection measures take either the form of choosing a material for exposed parts of the bearing to which the environment is not aggressive, or of providing exposed parts of the bearings with a protective coating, or some other device, such as an oil bath, to isolate them from the environment.

Manufacturers can normally be expected to have one or more protective systems with which they are familiar and which they are fully equipped to apply. It will normally be prudent for a purchaser to accept such a system provided that the manufacturer can supply sufficient evidence to support his claimed life in the relevant environment (see **4.1.1.2**). The purchaser should also be satisfied that the protective system offered can be maintained in situ and that, if the bearings are supporting a steel structure, they can be re-coated with same system that will be used to re-coat the structure.

Certain locations may also require special protective measures. One example of this is where blown sand is likely to infiltrate moving parts and cause excessive wear. Another is where roosting or nesting birds are likely to interfere with the proper functioning of the bearings. In such cases protective shields may be attached to the bearing or to the adjacent structure. Care must also be taken to ensure that such measures do not cause harmful condensation on bearing surfaces.

Fire is not normally a hazard to which structural bearings are subjected. If however, they are installed in a building with a specified fire resistance they will clearly be required to have the same fire resistance. In such circumstances they will be required to undergo the relevant fire test with any applied protective measures in place.

Subclause **4.1** of Part 1 of this European Standard requires bearings and structures to be designed so that the bearings can be maintained. In this context it should be noted that, if bearings have special protective measures, then they should be readily removable or flexible enough to allow inspection of and proper access to the bearing.

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