

Railway applications — Axleboxes — Rolling bearings

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British Standard

ICS 45.060.10; 45.060.20

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CEN

European Committee for Standardization
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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 256, Railway applications, the secretariat of which is held by DIN.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of the following EU Directives:

- Council Directive 96/48/EEC of 23 July 1996 on the interoperability of the European high-speed train network¹⁾;
- Council Directive 93/38/EEC on 14 June 1993 co-ordinating the procurement procedures of entities operating in the water, energy, transport and telecommunications sectors²⁾;
- Council Directive 91/440/EEC of 29 July 1991 on the development of the Community's railways³⁾.

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of an identical text or by endorsement, at the latest by September 1998, and conflicting national standards shall be withdrawn at the latest by September 1998.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.

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¹⁾ Official Journal of the European Communities No L 235 of 17.9.96.

²⁾ Official Journal of the European Communities No L 199 of 9.8.93.

³⁾ Official Journal of the European Communities No L 237 of 24.8.91.

Introduction

This European Standard has been drawn up with the purpose of aiming at optimum performance in rail transportation. Performance implies a certain quality level of the vehicle running gear, which every railway company may require, notably by imposing procedures in approval and requesting the existence of a quality assurance system for the supply of rolling bearings intended for rolling stock operating on its network or other networks in Europe.

1 Scope

This European Standard defines the quality parameters of axlebox rolling bearings, required for reliable operation of trains on European networks. It covers metallurgical and material properties as well as geometric and dimensional characteristics. It also defines methods for quality assurance and conditions for approval of the products.

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 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.

EN 473, *Qualification and certification of NDT personnel — General principles*.

EN 12081, *Railway applications — Axleboxes — Lubricating greases*.

EN 12082, *Railway applications — Axleboxes — Performance testing*.

EN ISO 9001, *Quality systems — Model for quality assurance in design/development, production, installation and servicing* (ISO 9001:1994).

EN ISO 9002, *Quality systems — Model for quality assurance in production, installation and servicing* (ISO 9002:1994).

ISO 281, *Rolling bearings — Dynamic load ratings and rating life*.

ISO 307, *Plastics — Polyamides — Determination of viscosity number*.

ISO 492, *Rolling bearings — Radial bearings — Tolerances*.

ISO 683-17, *Heat treated steels, alloy steels and free-cutting steels — Part XVII: Ball and roller bearing steels*.

ISO 1183, *Plastics — Methods for determining the density and relative density of non-cellular plastics*.

ISO 1218, *Plastics — Polyamides — Determination of "melting point"*.

ISO 2639, *Steel — Determination and verification of the effective depth of carburized and hardened cases*.

ISO 4967, *Steel — Determination of content of non-metallic inclusions — Micrographic method using standard diagrams*.

ISO 6507-1, *Metallic materials — Hardness test — Vickers test — Part 1: HV 5 to HV 100*.

ISO 6508, *Metallic materials — Hardness test — Rockwell test (Scales A-B-C-D-E-F-G-H-K)*.

3 Definitions

For the purposes of this standard the following definitions apply:

3.1

customer

railway company, manufacturer or buyer of railway rolling stock or sub-assemblies, or their representative

3.2

railway company

organization or its representative, whatever status it has, which is responsible for the registration of rolling stock

3.3

supplier

supplier of axlebox rolling bearings manufactured under his responsibility

3.4

network

the infrastructure, on which any railway company can operate rolling stock

3.5

axlebox

assembly of box housing, rolling bearings, sealing and grease

3.6

rolling bearing

bearing, operating with rolling motion between the parts supporting load and moving in relation to each other

3.7

cartridge bearing

rolling bearing with two or more rows of rolling elements within a single outer ring, greased and equipped with integral seals

3.8

ring

annular part of a rolling bearing incorporating one or more raceways

3.9

rolling elements

cylindrical, tapered or convex rollers or balls

3.10

cage

component, which partly surrounds the rolling elements and moves with them

3.11

grease

semi-solid lubricant, which consists of a thickener and additives dispersed in a lubricating oil

3.12

sealing

component that protects the bearings against ingress of water and dust and retains the grease in the rolling bearings

3.13

box housing

structural component which contains rolling bearings, sealing and grease

4 Information and requirements to be agreed and documented

4.1 General

The following information shall be fully documented by the supplier. Both the requirements specified throughout this European Standard and the following documented requirements shall be satisfied before a claim of compliance with this standard can be made and verified.

4.2 Information to be supplied by customer

The following information is to be supplied by the customer and shall be fully documented:

- interface drawing showing mounting conditions; all dimensions of the space available for the rolling bearings; dimensions, tolerances and materials of shaft and box housing;
- load spectra;
- ambient temperatures in operation;
- if required special steel composition, cleanliness and soundness class (see 7.1 and 10.2);
- approval procedure type and conditions to be applied (see clause 14 and annex E);
- special conditions for quality records and traceability (see 6.3 and clause 13).

4.3 Optional requirements

If the customer wishes to take up any of the optional requirements given in 8.2, 10.2.1, 10.3, 10.4, clause 11, clause 12 and 15.2, such requirements shall be specified and documented.

4.4 Requirements for agreement

The following requirements to be agreed between the contracting parties, which are specified in the clauses referred to, shall be fully documented:

- boundary dimensions and interface tolerances of the rolling bearing (see clause 8);
- internal clearance values before and after mounting (see clause 8);

— references to standards and special requirements (see clause 7 and 10.2);

— use of steel of special composition, manufacture or metallurgical quality (see 7.1);

— soundness class, 1 or 2, and the test methods to be used (see 10.2);

— type of heat treatment to be applied and methods of testing (see 6.2, 10.3, 10.4 and 12.2);

— the marking (see clause 11);

— the inspection plan (see 12.1);

— for cartridge bearings grease designation, quantity and distribution (see 15.1);

— for non-sealed bearings, grease designation and compatibility with preservatives (see 15.2).

5 Quality systems

The supplier shall operate a quality system according to EN ISO 9001 or EN ISO 9002. Personnel responsible for non-destructive testing shall be qualified and certified in accordance with EN 473.

6 Manufacture

6.1 Steel manufacturing

The process of steel manufacture in mass production shall be such that the metallurgical characteristics are the same as those of the rolling bearings submitted for the approval procedure.

NOTE The choice of manufacturing procedures is left to the discretion of the supplier.

6.2 Heat treatment

The heat treatment processes for the rolling bearing components shall be such that the hardness values specified in 10.3 and/or 10.4 are respected. The heat treatment processes shall be such that all the rolling bearings produced in a production batch are treated uniformly.

6.3 Traceability

At the customers request, the supplier shall set up and maintain a system of identification and traceability of finished products (see clause 4), which allows the detection, based on an identification mark, of the following elements:

- material origin including the chemical analysis of every heat and steel manufacturing batch;
- heat treatments;
- inspection of boundary dimensions as well as inspection of soundness;
- batch number.