



SLOVENSKI STANDARD
SIST EN 12081:2001
01-marec-2001

Železniške naprave - Ohišja ležajev kolesnih dvojic - Maziva

Railway applications - Axleboxes - Lubricating greases

Bahnanwendungen - Radsatzlager - Schmierfette

Applications ferroviaires - Boîtes d'essieux - Graisses pour lubrification

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Ta slovenski standard je istoveten z: EN 12081:1998

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ICS:

45.040

75.100

SIST EN 12081:2001

en

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EUROPEAN STANDARD

EN 12081

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 1998

ICS

Descriptors: railway equipment, railway rolling stock, axlebox, rolling bearing, lubrication, greases, definition, manufacturing, quality, tests, storage

English version

Railway applications - Axleboxes - Lubricating greases

Applications ferroviaires - Boîtes d'essieux - Graisses pour
lubrification

Bahnanwendungen - Radsatzlager - Schmierfette

This European Standard was approved by CEN on 22 February 1998.

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.

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

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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 (MO24) 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 of 14 June 1993 coordinating 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⁾

For relationship with specific EU Directives, see informative Annex ZA which is an integral part of this standard.

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.

Introduction

This European Standard has been drawn up with the purpose to define the minimum requirements of greases used for the lubrication of rolling bearings in railway axleboxes. The purpose is to ensure a certain performance level in the interest of operating safety in international traffic. Performance implies a certain quality level of the vehicle running gear, which every railway company may require, notably by imposing procedures in approval and quality assurance for the supply of axleboxes.

This specification has been written so that it reflects the typical performance of a NLGI grade 2 simple lithium soap grease, based on a mineral oil with a base oil viscosity of 100 mm²/s at 40 °C such as would be found in current use. However, this specification must not restrict or limit grease evolution for more demanding applications of today and in the future, hence several parameters are left open for agreement. For example, the base oil viscosity can be reduced for high speed applications, and where sealed bearing units are being used the grease grade may need to be lower.

European Standards on test methods for lubricating greases are in preparation. Until these ENs will be published, the national standards contained in clause 2 Normative references are to be applied. If particular methods are not covered by the above references, they have to be specifically agreed upon.

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1 Scope

This European Standard defines the quality requirements of greases intended for the lubrication of axlebox rolling bearings according to EN 12080, required for reliable operation of trains on European networks. It covers the approval procedure, the method of quality control and quality monitoring of the grease. The grease requirements are given for two speed classes.

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

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.

EN 12080	Railway applications - Axleboxes - Rolling bearings
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 2137	Petroleum products - Lubricating grease and petrolatum - Determination of cone penetration
ISO 2176	Petroleum products - Lubricating grease - Determination of dropping point
ISO 3104	Petroleum products - Transparent and opaque liquids - Determination of kinematic viscosity and calculation of dynamic viscosity
ISO 3733	Petroleum products and bituminous materials - Determination of water - Distillation method
ISO 11007	Petroleum products and lubricants - Determination of rust-prevention characteristics of lubricating greases
ISO/DIS 13737	Petroleum products - Lubricating greases - Determination of low-temperature cone penetration
BS 2000 : Part 121	Methods of test for petroleum and its products - Determination of oil separation from lubricating grease - Pressure filtration method
DIN 51811	Prüfung von Schmierstoffen - Prüfung der Korrosionswirkung von Schmierfetten auf Kupfer - Kupferstreifenprüfung
DIN 51817-2	Prüfung von Schmierstoffen - Bestimmung der Ölabscheidung aus Schmierfetten unter statischen Bedingungen - Teil 2: Verfahren für Schmierfette, einzusetzende Prüflager, Schrägkugellager oder Kegelrollenlager
E DIN 51819	Prüfung von Schmierstoffen - Mechanisch-dynamische Prüfung auf dem Wälzlagerschmierstoff-Prüfgerät FE 8
DIN 51820	Prüfung von Schmierstoffen- Infrarotspektrometrische Analyse von Schmierfetten - Aufnahme und Auswertung von Infrarotspektren
DIN 53521	Prüfung von Kautschuk und Elastomeren - Bestimmung des Verhaltens gegen Flüssigkeiten, Dämpfe und Gase
NF F 19-502	Matériel roulant ferroviaire - Méthode d'essais des graisses pour boîtes d'essieux à roulements - Essai de résistance aux vibrations et aux chocs sur banc ROPECS
NF F 19-503	Matériel roulant ferroviaire - Méthode d'essais des graisses pour boîtes d'essieux à roulements - Essai dynamique de la stabilité à l'oxydation des graisses
NF F 19-504	Matériel roulant ferroviaire - Méthode d'essais des graisses pour boîtes d'essieux à roulements - Essai d'aptitude à la lubrification sur machine R2F
NF T 60-189	Graisses lubrifiantes - Tendance à l'écoulement des graisses pour moyeux de roues automobiles
NF T 60-190	Produits pétroliers - Stabilité au laminage des graisses lubrifiantes
NF T 60-191	Produits pétroliers et graisses lubrifiantes - Séparation d'huile au stockage des graisses lubrifiantes - Méthode sous pression - Conditions statiques

3 Definitions

For the purpose of this standard the following definitions apply:

- 3.1 customer:** railway company, manufacturer or buyer of railway rolling stock or subassemblies, or their representative.
- 3.2 railway company:** organisation or its representative, whatever status it has, which is responsible for the registration of rolling stock
- 3.3 supplier:** supplier of lubricating greases manufactured under his responsibility.
- 3.4 network:** the infrastructure, on which any railway company can operate rolling stock.
- 3.5 grease:** semi-solid lubricant, which consists of a thickener and additives dispersed in a lubricating oil.
- 3.6 grease batch:** the entire content of a single production from a finishing vessel.

4 Nature of greases

Greases, complying with this European Standard, shall be free from toxic or harmful substances according to European legislation. Mineral oil based simple lithium soap greases, that fulfil the requirements of this European Standard to lubricate axlebox rolling bearings according to EN 12080, shall comply with the specification detailed in table A.1. Additional requirements for high speed or specific bearing types, environment or operating conditions are detailed in table B.1.

For greases based on different types of thickener or oil, a new standard may be required.

5 Information and requirements to be agreed and documented

5.1 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 the standard can be made and verified.

5.2 Information to be provided by customer

The following information are to be provided by the customer and shall be fully documented:

- relevant application data: rolling bearings, loads, ambient temperatures, speed class a or b, and intended maintenance;
- approval type and conditions (see clause 7 and Annexes A, B and C);
- testing, quality records and traceability (see clause 9);
- delivery, packaging and marking (see clause 10).

5.3 Information to be provided by supplier

The following information are to be provided by the supplier and shall be fully documented:

- for the approval, a comprehensive technical data sheet of the grease and the safety data sheet in accordance with the Directive 91/155/EEC.

5.4 Requirements for agreement

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

- approval type and conditions (see clause 7 and Annexes A, B and C);
- testing, quality records and traceability (see clause 9);
- delivery, packaging, marking and storage (see clauses 10 and 11);

- specification sheet, to be established after the approval of the product with:
 - the results of the approval tests (see clause 7 and Annexes A, B and C);
 - the speed class, a or b, for which the grease is approved (see clause 8);
 - the limits for base oil viscosity and grease consistency for the approval and batch control tests (see Annex A);
 - the method to evaluate the ability to lubricate (see Annex A);
 - the characteristics subject to the batch control tests, the limits and the frequency of these tests (see 9.3).

6 Quality systems

The supplier shall operate a quality system conforming to EN ISO 9001 or EN ISO 9002.

7 Approval

Greases shall pass an approval procedure as agreed and documented in accordance with 5.4.

Every new grease or new application of a grease already in service shall be approved in accordance with Annexes A, B and C.

The quantity of grease required for all the approval tests shall be from the same industrial batch and shall be supplied in one consignment.

8 Speed classes

The grease requirements are given for two speed classes and expressed as a speed factor:

- Class a: greases for rolling bearings in axleboxes with $n \cdot d_m \leq 250\,000$;
- Class b: greases for rolling bearings in axleboxes with $n \cdot d_m > 250\,000$.

The final approval of a grease to class a or class b will be determined as a result of the performance test and the service test (see Annex C and EN 12082).

NOTE: The value $n \cdot d_m = 250\,000$ corresponds to a wheel diameter = 840 mm, a bearing mean diameter $d_m = 195$ mm and a vehicle speed of 200 km/h; n = rotational speed in r/min.

9 Production

9.1 General

The manufacturing procedure is left to the discretion of the grease manufacturer, but subject to the following conditions.

9.2 Manufacturing procedure

The manufacturing process of the standard production of the grease shall be the same as that applied for the grease submitted for approval. After approval, the customer shall be notified of any change of the manufacturing process, of the composition or of the manufacturing plant. In this case, such a new approval can be required.

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9.3 Batches

For purposes of quality assurance and quality control, the greases are allocated batch identifications (see 3.6). Testing of these batches shall be as agreed and documented in accordance with 5.4, using the procedures in table A.1 and, if required, table B.1. These tests are carried out by the supplier, the customer or jointly. When made by the supplier, the customer may attend at such tests. The results shall be recorded and documented according to the supplier ISO quality procedure and be available on request. Any unsatisfactory results of these tests shall cause the rejection of the whole batch.

9.4 Traceability

Traceability and in particular the taking of control samples, shall be agreed and documented in accordance with 5.4. At the customers request, the grease manufacturer shall set up and keep operational a system of identification and traceability of the grease and the grease components at every stage of production, testing and delivery.

10 Delivery

10.1 Packaging

The grease shall be supplied in the packs agreed and documented in accordance with 5.4.

10.2 Marking

Every pack shall be marked with:

- name of the supplier,
- brand name of the grease,
- batch number and manufacturing date, in clear or coded form,
- net mass,
- other information as agreed and documented in accordance with clause 5.

11 Storage

The supplier shall ensure that the grease has not been stored for more than 12 months from the date of manufacture.

Storage shall be in the original and unopened pack indoors between - 5 °C and + 30 °C.

Grease in an opened pack is to be protected against the environment and shall be used without delay.

NOTE: It is the responsibility of the customer to use the product within 12 months of its delivery. If the grease is stored for more than 24 months from the date of manufacture, then it is strongly recommended that the quality of the batch is verified.

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