



SLOVENSKI STANDARD

SIST EN 12080:2017/oprA1:2021

01-maj-2021

Železniške naprave - Ohišja ležajev kolesnih dvojic - Kotalni ležaji - Dopolnilo A1

Railway applications - Axleboxes - Rolling bearings

Bahnanwendungen - Radsatzlager - Wälzlager

Applications ferroviaires - Boîtes d'essieux - Roulements

Ta slovenski standard je istoveten z: EN 12080:2017/prA1

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ICS:

21.100.20	Kotalni ležaji	Rolling bearings
45.040	Materiali in deli za železniško tehniko	Materials and components for railway engineering

SIST EN 12080:2017/oprA1:2021

en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
EN 12080:2017
prA1

March 2021

ICS 21.100.20; 45.040

English Version

Railway applications - Axleboxes - Rolling bearings

Applications ferroviaires - Boîtes d'essieux -
Roulements

Bahnanwendungen - Radsatzlager - Wälzlager

This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 256.

This draft amendment A1, if approved, will modify the European Standard EN 12080:2017. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 12080:2017/prA1:2021) has been prepared by Technical Committee CEN/TC 256 “Railway Applications”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

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 2016/797/EC.

For relationship with EU Directive 2016/797/EC, see informative Annex ZA, which is an integral part of EN 12080:2017.

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EN 12080:2017/prA1:2021 (E)**1 Modification to the European foreword**

Add the following item in the list of changes:

- The use of conditioning for polymer cages is no longer mandatory and is specified in 4.2
- A clarification of deviations in marking of cylindrical roller bearings is new in 11.2 and 11.3
- The inspection plan for inclusion content in 12.1 (footnote h in Table 3) has been made clearer and now also includes specifications for sample preparations
- The sensor definition in C.3 is now more relevant
- Conditioning can now be performed also at the bearing manufacturer (see D.2.4)
- The sample frequency for polymeric cages in D.3.1.1 is now more relevant and the terms “Approval” and “Series” are better defined
- Table D.1 has been renamed for clarity and the requirements for “Viscosity index” and “Length of glass fibres” have been relaxed to be more relevant
- The requirement for “Mechanical test for material approval” in Table D.1 have been changed so that it is clear that the Charpy impact test is on “un-notched” samples and made according to the relevant norm, the requirement for the “Bending strength on the test specimen” is changed and a clarification on how “Thermal ageing in grease or oil bath” is performed has been added
- Footnote d in Table D.1 now allows for use of inspection certificate 3.1 and a new footnote “h” is added to specify sampling frequency
- ISO 15512 can be used for moisture content determination in D.3.2 and a clarification on the use of desiccator is added
- In D.3.4.3 some additions are made on how to address burrs on the edge and outside of functional areas
- D.3.5 is rewritten to address “void clusters” and Figure D.1 is replaced
- The Annex ZA has been revised to take into account EU Directive 2016/797/EC

2 Modification to Clause 2, Normative references

Add the following reference:

ISO 15512:2016, Plastics — *Determination of water content*

3 Modification to 4.2, Technical specification content

Replace “18) selection of mechanical testing method for cages of polymeric material (see D.4.1)” with:

“18) selection of mechanical testing method for cages of polymeric material (see D.4.1) and selection if conditioning shall be used or not for polymer cages (See D.2.4)

4 Modification to 6.3, Traceability

Replace "Chemical analysis (all elements)" *with*:

Chemical analysis (all elements having content limitations according to ISO 683-17)

Delete spacing before comma accordingly:

"Name, manufacturer";

5 Modification to 11.2, Marking of rings for cylindrical roller bearings (CRB)

Add the following sentence at the end of 11.2, before Figure 1:

"Deviations from marking on "Chamfer side" according to Figure 1 — Marking of CRB inner rings, shall be defined in the technical specification according to Clause 4."

6 Modification to 11.3, Marking of cartridge bearings for axleboxes

Add the following sentence at the end of 11.3, before Figure 2:

Deviations in the location of the marking for cartridge bearings shall be defined in the technical specification according to Clause 4.

7 Modification to 12.1, Inspection plan

Replace the following footnote h in Table 3 "For ingot casting once every steel melt. For continuous casting for beginning, middle and end of the casting process. Samples to be taken after forging and heat treatment on forged bars." *with*:

Every melt for ingot cast steel and continuously cast steel. For continuously cast steel, the specimens shall preferably be from the start and end of the cast. The specimens shall be taken from rolled or forged bar and shall be hardened and tempered to a minimum of HV350 prior to polishing.

8 Modification to Annex C, C.3, Equipment

Replace "a sensor with a differential winding"; *with*:

"a suitable sensor to detect reference artificial defect as described in C.4.3.1";

9 Modification to Annex D, D.2.4, Conditioning

Replace "Conditioning shall be performed at the cage manufacturer." *with*:

"Conditioning shall be performed at the cage or bearing manufacturer if specified in Clause 4."

10 Modification to Annex D, D.3.1.1, General

Replace "Samples from the polymeric cages shall be taken from suitable points that are deemed critical from an injection moulding perspective, such as the area connecting to the cage bar, areas with maximum wall thickness or material agglomerations. At least one sample shall be taken from one cage." *with*:

"Samples from the polymeric cages shall be taken from suitable points that are deemed critical from an injection moulding perspective, such as the area connecting to the cage bar, areas with maximum wall thickness or material agglomerations. At least one sample shall be taken from one cage. Sample frequency shall be once per batch of cages produced. Samples for test of chemical composition, viscosity index and density can be taken once per batch of cages produced or per material batch.

EN 12080:2017/prA1:2021 (E)

The term “Approval” in Table D.1 refers to Annex E and the term “Series” in Table D.1 refers to series production.”

Replace the title of Table D.1 with:

“Table D.1 — Requirements and test method for polymer cages”

Replace Table D1 with:

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Material				
Property	Requirements	Test	Approval	Series
Moisture content (after conditioning if required - D.2.4)	1 – 2,5 %	D.3.2	Yes	Yes ^b
Chemical composition	^c	^a	Yes	Yes ^g
Melting point	^c ± 5°[°C]	EN ISO 11357-3	Yes	Yes ^g
Viscosity index	^c ± 30 [cm ³ /g], Solvent: formic acid 90 % or sulphuric acid 96 %	EN ISO 307	Yes	Yes ^g
Density	^c ± 0,025 g/cm3	EN ISO 1183-1 or EN ISO 1183-2	Yes	Yes ^g
Fillers				
Property	Requirements	Test	Approval	Series
Rate of glass fibres	^c ± 2,5 %	EN ISO 3451- 1 EN ISO 1172	Yes	Yes
Length of glass fibres	0,1 to 1,0 mm for 90 % of the glass fibres	D.3.3	Yes	No
Diameter of glass fibres	12 ± 3 µm on average value of measurements	D.3.3	Yes	No
Mechanical tests for injection approval				
Property	Requirements	Test	Approval	Series
Bending test on cage or	At least 90 % of ^e Method agreed (Clause 4)	D.4 – at least one of these three tests is required ^f	Yes	Yes
Tension test on cage body or				
Tension test on cage bar				
Mechanical tests for material approval				
Impact strength or un-notched Charpy impact strength on the test specimen	≥ 40 kJ/m ²	EN ISO 179/1eU See ^e and ^f	Yes	No
Bending strength on the test specimen	> 90 % of reference value ^c	EN ISO 178 ^e and ^f	Yes	No
Thermal ageing in grease or oil bath	To be performed at customer's request (Clause 4, test specimens allowed)	D.5	Yes	No
Visual inspection				
Property	Requirements	Test	Approval	Series
Sub-surface quality	See D.3.5	D.4	Yes	Yes
Surface quality	see D.3.4	D.3.4.2	Yes	Yes

^a Suitable methods such as thermal analysis, infrared spectroscopy or gas chromatography are used to identify and determine the chemical composition and the components of the material used for the polymeric cage.

^b Inspection frequency is minimum two samples per batch or annually, to be agreed according to Clause 4.

^c Material data sheet or inspection certificate 3.1 from the cage material supplier documented in accordance to Clause 4.

^d Reference established either on the initial samples (new cage) or on existing parts for cage already produced. documented in accordance to Clause 4.

^e Sample moisture content < 0,1 % according to D.3.2.

^f Separately manufactured test specimens using the same granulate batch may be used if the cage to be tested does not provide sufficient material to test according to EN ISO 179-1.

^g Once per batch of cages or material

11 Modification to Annex D, D.3.1.2, Inspection frequency for series production

Replace “The inspection frequency shall be based on the batch size, i.e. for a batch size of $\leq 5,000$ cages two cages each at 10 %, 50 % and 100 % of the batch size $> 5,000$ two cages each at 10 %, 30 %, 50 %, 70 % and 100 % of the batch.” with:

“Unless otherwise specified in Table D.1 the inspection frequency shall be based on the batch size, i.e. for a batch size of $\leq 5\,000$ cages two cages each at 10 %, 50 % and 100 % of the batch size $> 5\,000$ two cages each at 10 %, 30 %, 50 %, 70 % and 100 % of the batch.”

12 Modification to Annex D, D.3.2, Moisture content

Replace “In case of disputes, drying for 96 h at 110 °C and approx. 250 mbar is required (see EN ISO 179-1).” with:

“In case of disputes, drying for 96 h at 110 °C and approx. 250 mbar is required. Determination of moisture content according to ISO 15512 (or equivalent method that give the same result) can also be used.”

Replace “A desiccator shall be used for cage water content measurement on samples.” with:

“A desiccator shall be used to store the cages in dry condition after the drying process prior to the cage water content measurement.”

13 Modification to Annex D, D.3.4.3, Burrs

Add the following new bullet point after the first one.

“— Burrs located on the edge of functional areas can be accepted provided they do not exceed 0,2 mm. A defect catalogue to define the acceptance limits for such burrs shall be created and maintained”;

Replace “The maximum permitted height of burrs shall not exceed 0.2 mm outside of functional areas.” with:

“The maximum permitted height of burrs shall not exceed 0,2 mm outside of functional areas. Exceptions can be accepted. A defect catalogue to define the acceptance limits for such burrs shall be created and maintained.”

Add the following NOTE at the end of the subclause:

“NOTE Usually the manufacturer is responsible for creating and maintaining a defect catalogue.”

14 Modification to Annex D, D.3.5 Sub-surface quality

Replace the whole subclause with:

The inspection for voids shall be performed on the fracture surfaces of the cages (fracture test), either on those units which are submitted to the fracture test on the tensile tester or on units taken from the ongoing manufacturing process and broken intentionally (at points of maximum wall thickness or material agglomerations). Inspection can also be performed on cut and ground sections of the cage.