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Železniške naprave - Zgornji ustroj - Betonski pragi in kretniški betonski pragi - 3. del: Dvodelni armiranobetonski pragi

Railway applications - Track - Concrete sleepers and bearers - Part 3: Twin-block reinforced sleepers

Bahnanwendungen - Oberbau - Gleis- und Weichenschwellen aus Beton - Teil 3: Bewehrte Zweiblockschwellen

Applications ferroviaires - Voie - Traverses et support en béton - Partie 3 : Traverses biblocs en béton armé

Ta slovenski standard je istoveten z: **EN 13230-3:2009**

ICS:

45.080	Traļ nice in ģelezniģki deli	Rails and railway components
91.100.30	Beton in betonski izdelki	Concrete and concrete products

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English Version

Railway applications - Track - Concrete sleepers and bearers - Part 3: Twin-block reinforced sleepers

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Foreword

This document (EN 13230-3:2009) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by December 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13230-3:2002.

This European Standard is one of the series EN 13230 "Railway applications – Track – Concrete sleepers and bearers", which consists of the following parts:

— Part 1: General requirements

— Part 2: Prestressed monoblock sleepers

— Part 3: Twin-block reinforced sleepers

— Part 4: Prestressed bearers for switches and crossings

— Part 5: Special elements

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 EC Directive 2008/57/EC.

For relationship with EC Directive 2008/57/EC, see informative Annex ZA, which is an integral part of this document.

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

Introduction

This part of the standard defines the specific requirements dedicated to twin-block reinforced sleepers.

These are additional requirements to EN 13230-1:2009 and are necessary to have a complete standard dealing with twin-block reinforced sleepers.

The document specifies the test arrangements and the test procedures to implement and also the corresponding acceptance criteria just as the design approval tests

It also specifies the steel connecting bar characteristics and the design criteria for incorporating the steel connecting bar within the twin-block reinforced sleepers.

1 Scope

This part of EN 13230 defines technical criteria and control procedures for designing and manufacturing twin-block reinforced concrete sleepers.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 206-1, *Concrete – Part 1: Specification, performance, production and conformity*

EN 10002-1, *Metallic materials – Tensile testing – Part 1: Method of test at ambient temperature*

EN 13230-1:2009, *Railway applications – Track – Concrete sleepers and bearers – Part 1: General requirements*

EN ISO 6506-1, *Metallic materials – Brinell hardness test – Part 1: Test method (ISO 6506-1:1999)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13230-1:2009 and the following apply.

3.1
steel connecting bar
steel profile which connects reinforced concrete blocks

4 Product testing

4.1 Test arrangements

This section defines the testing regime and rules for acceptance of twin-block concrete sleepers.

The layout of test arrangements for the rail seat section tests are defined in this section.

4.1.1 Symbols

The following symbols are used as defined in Table 1:

Table 1 — Symbols

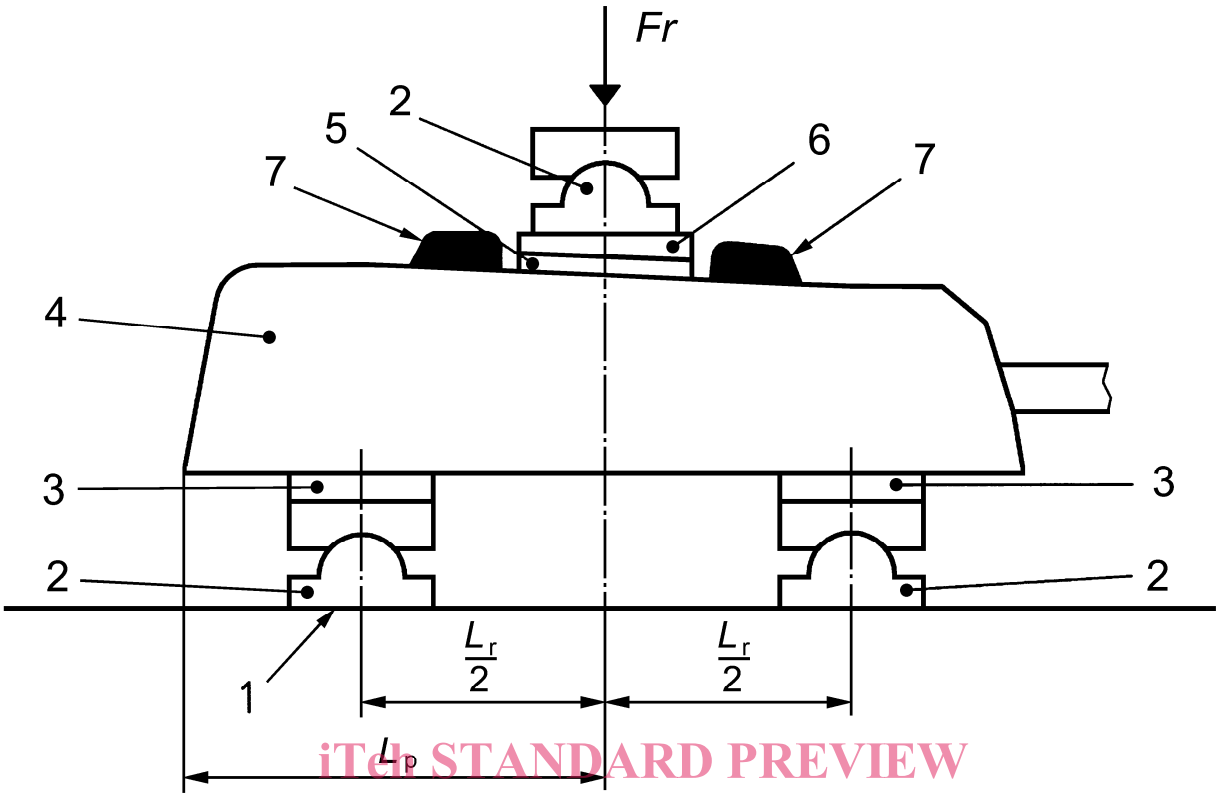
Symbol	Designation
Fr_0	Positive initial reference test load for the rail seat section, in kN
Fr_{0n}	Negative initial reference test load at rail seat section, in kN; Fr_{0n} = ½· Fr_0
Fr_r	Positive test load which produces first crack formation at the bottom of the rail seat section, in kN
Fr_{rn}	Negative test load which produces first crack formation at the top of rail seat, in kN
$Fr_{0,05}$	Maximum test load for which a crack width of 0,05 mm at the bottom of the rail seat section persists after removal of the load, in kN
$Fr_{0,05n}$	Maximum test load for which a crack width of 0,05 mm at the top of rail seat section persists after removal of the load, in kN
$Fr_{0,5}$	Maximum test load for which a crack width of 0,5 mm at the bottom of the rail seat section persists after removal of the load, in kN
Fr_B	Maximum positive test load at the rail seat section which cannot be increased, in kN
Fr_{Bn}	Maximum negative test load on the top of rail seat section which cannot be increased, in kN
Fr_u	Lower test load for the rail seat section dynamic test; Fr_u = 50 kN
L_p	Design distance between the centre line of the rail seat to the edge of the sleeper at the bottom, in m
L_r	Design distance between the articulated support centre lines for the test arrangement at the rail seat section, in m
Mdr	Positive design bending moment at rail seat, in kNm
k_{1s}	Static coefficient to be used for calculation of $Fr_{0,05}$ or $Fr_{0,05n}$ test load
k_{2s}	Static coefficient to be used for calculation of $Fr_{0,5}$ or Fr_B test load
k_{1d}	Dynamic coefficient to be used for calculation of $Fr_{0,05}$ test load
k_{2d}	Dynamic coefficient to be used for calculation of $Fr_{0,5}$ or Fr_B test load

4.1.2 Rail seat section

The arrangement for the rail seat positive load test is shown in Figure 1.

The position of articulated supports (L_r) is defined in Table 2.

The load Fr is applied perpendicularly to the base of the sleeper.

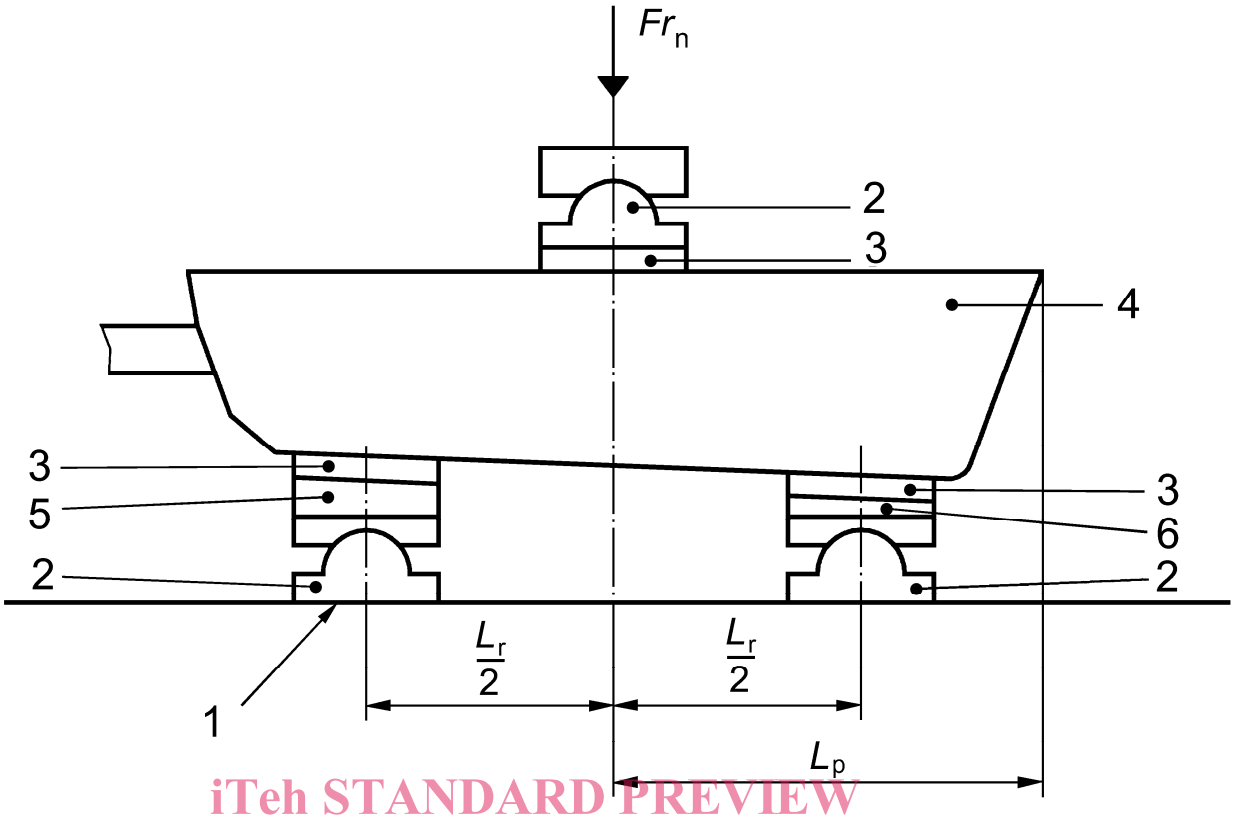


Key

1 Rigid support
2 Articulated support (see Annex A for details)
3 Resilient pad (see Annex A for details)
4 Reinforced concrete block
5 Standard rail pad as defined by the purchaser
6 Tapered packing (see Annex A for details)
7 Lateral stop and base plate when used. To be agreed by the purchaser

Figure 1 — Test arrangement at the rail seat section (positive bending moment)

The test arrangement for the rail seat negative load test is shown in Figure 2, the value of L_r in relation to L_p.is detailed in Table 2.



Key

1 Rigid support
2 Articulated support (see Annex A for details)
3 Resilient pad (see Annex A for details)
4 Reinforced concrete block
5 Special tapered packing
6 Special tapered packing

Figure 2 — Test arrangement at the rail seat section (negative bending moment)

Table 2 — Value of L_r in relation to L_p

L_p in m	L_r in m
$L_p < 0{,}349$	0,3
$0{,}350 \leq L_p < 0{,}399$	0,4
$0{,}400 \leq L_p < 0{,}449$	0,5
$L_p \geq 0{,}450$	0,6

4.2 Test procedures

4.2.1 Test loads

Fr_0 is calculated from the geometry given in Figure 1 and values from Table 3 using the following equation:

$$Fr_0 = \frac{4\,Mdr}{L_r - 0{,}1} \text{ in kN} \qquad (1)$$

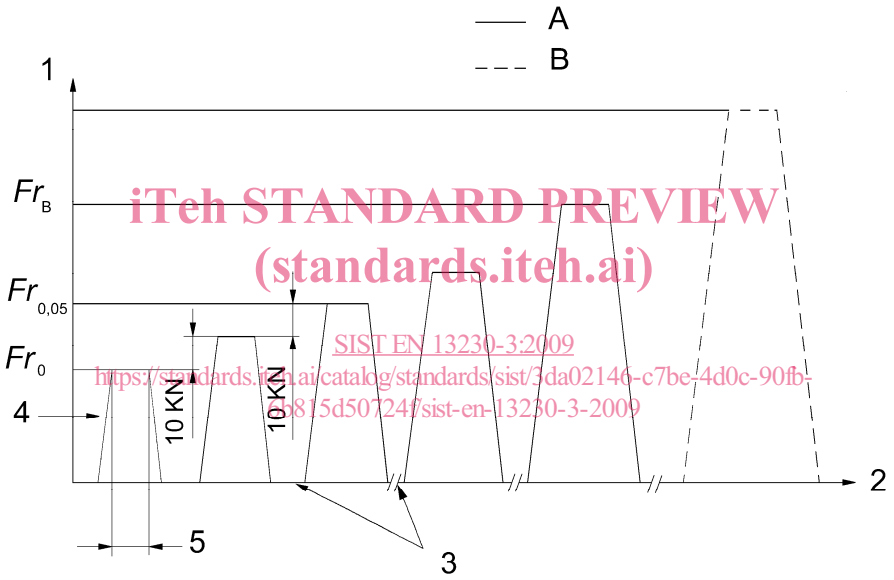
Table 3 — Value of Fr_0 in relation to L_r

L_r in m	0,4	0,5	0,6
Fr_0 in kN	13 *Mdr*	10 *Mdr*	8 *Mdr*

For the definition of *Mdr:* see EN 13230-1:2009, Clause 3.

4.2.2 Static test

The static test procedure at the rail seat section for design approval and routine tests is shown in Figures 3, 4 and 5.



Key

1 Load
2 Time
3 Crack checking (maximum duration 5 min)
4 120 kN/minute maximum
5 From 10 s minimum to 5 min maximum
A Required part of test
B Optional part of test

Figure 3 — Static test procedure at the rail seat section for positive design approval test