SLOVENSKI STANDARD
oSIST prEN 13715:2015

01-junij-2015

Železniške naprave - Kolesne dvojice in podstavni vozički - Kolesa - Profil tekalne površine

Railway applications - Wheelsets and bogies - Wheels - Tread profile

Bahnanwendungen - Radsätze und Drehgestelle - Räder - Radprofile

Applications ferroviaires - Essieux montés et bogies - Roues - Profil de roulement

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ICS:

45.040	Materiali in deli za železniško tehniko	Materials and components for railway engineering

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English Version

Railway applications - Wheelsets and bogies - Wheels - Tread profile

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

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Foreword

This document (prEN 13715:2015) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This is currently submitted for review.

This document is intended to replace EN 13715:2006+A1:2010

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Introduction

This standard states requirements that are in accordance with the principles adopted by the International Union of Railways.

It describes the rules, parameters and construction methods of the wheel tread profile;

It defines the geometry of the flange and reverse slope. The thicknesses and height of the flange are determined by the railway undertaking or its representative in compliance with the normative documents in force;

It defines the co-ordinates and geometry of the following three reference tread profiles of the wheels and their reverse slope:

— 1/40th (reverse slope 15 %);

— S1002 (reverse slope 6.7 %, other value used 15 %) in conformity with UIC Leaflet 510-2;

— EPS (reverse slope 10 %) equivalent to profile P8 of the United Kingdom with a flange 30 mm thick.

These three reference profiles are defined in Annexes B, C and D and represent original profiles from the time of their design, the flanges having been harmonised to a 32.5 mm flange thickness.

It defines the tolerances needed to achieve calibration control.

All the dimensions in this standard are given in millimetres.

1 Scope

This European Standard defines the tread profiles of wheels with a diameter greater than or equal to 330 mm used on vehicles running on European standard gauge track to fulfil interoperability requirements. These profiles apply to new wheels, whether free-standing or assembled as wheelsets, as well as to wheels that require reprofiling during maintenance.

2 Normative references

None apply to this standard.

3 Terms and definitions

For the purposes of this document, the following terms and definitions shall apply.

3.1
Technical specification
Document describing the requirements pertaining to specific parameters in addition to the requirements of this standard.

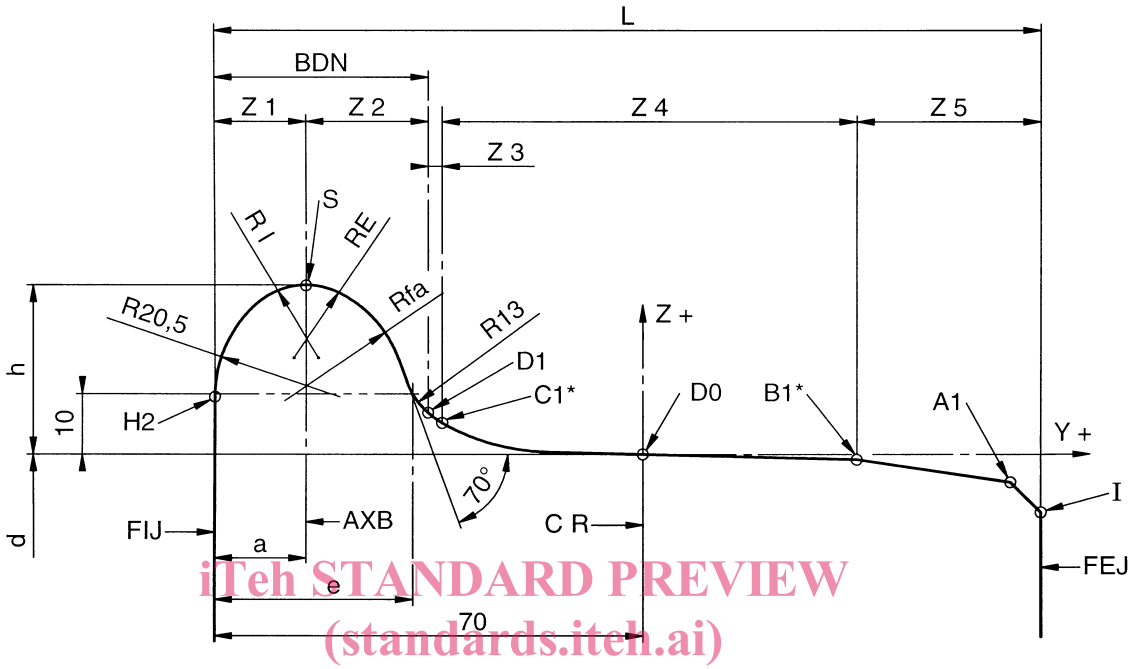
4 General

Given that this document describes three reference profiles used in Europe, any other profile that does not conform to this standard must be defined in a technical specification.

NOTE It is preferred that the profile defined in a technical specification is agreed on between the railway company and the infrastructure managing organisation.

5 Definition of the tread profile

The tread profile is shown in Figure 1.



Key

The points marked with "*" relate respectively to the following profiles

B1	S1002
B1a	1/40th
B1b	EPS
C1	S1002
C1a	1/40th
C1b	EPS

See Table 1 – Symbols and abbreviations

Figure 1 — Wheel tread profile

6 Symbols and abbreviations

Table 1 — Symbols and abbreviations

Z 1	Internal zone of flange (H2 – S)
Z 2	External zone of flange (S – D1)
Z 3	Connection zone, flange to wheel tread [D1 – C1(C1a, C1b)]
Z 4	Wheel tread zone [C1 (C1a, C1b) - B1 (B1a, B1b)]
Z 5	Zone between the wheel tread (reverse slope) and chamfer [B1 (B1a, B1b) – I]
a	Position of the axis intersecting the tip of the flange relative to the internal face of the wheel
d	Wheel diameter
e	Flange thickness
De	Difference between the reference value for flange thickness (32.5 mm) and the new value of "e"
h	Flange height
Y	Y axis
Z	Z axis
y	Abscissa according to "Y" axis for the specific point
z	Ordinate according to the "Z" axis for the specific point
A1	Connection point of the reverse slope with the 5 mm x 5 mm chamfer
B1 (B1a, B1b)	Connection point of the reverse slope with the wheel tread
C1 C1a, C1b)	Starting point of the connection zone between the wheel tread and the flange zone
C11a, C11b, C12, D1a, D1b, E1, F1, G1, H1, T1	Unique profile construction points
D0	Location of the wheel tread, 70 mm from its internal face. Origin of the co-ordinate axes
D1	Starting point of the flange
H2	Finishing point of the flange, on the internal face of the wheel
I	Starting point of the profile on the external face of the wheel
L	Rim nominal width, 135 mm or 140 mm
Rfa	External flange radius, a function of the flange height
RE	12 mm radius, connection to the external face of the flange
RI	12 mm radius, connection to the internal face of the flange
REm	Centre of radius RE
Rlm	Centre of radius RI
R13	13 mm radius, connection between the internal face of the flange and the wheel tread
Hm	Centre of 20.5 mm radius
Fm	Centre of Rfa radius
Dm	Centre of R 13 radius
Jm	Centre of 100 mm radius (EPS) and of 36 mm radius (1/40th)
Jm1	Centre of 330 mm radius (EPS)
S	Connection at the tip of the flange
AXB	Connection axis at the tip of the flange
BDN	Flange
CR	Wheel tread plane
FEJ	External face of the wheel
FIJ	Internal face of the wheel

The profiles comprise:

— two zones H2 – S and S – D1, with fixed geometry;

— a connection zone D1 – C1, unique to each reference profile, to make a tangential connection at point C1;

— a zone C1 – B1 (either B1a, or B1b) unique to each reference profile. The co-ordinates are given in Annexes B, C and D for the three reference profiles including point D0;

— a zone B1 (either B1a or B1b) – A1 – I, comprising the reverse slope and chamfer, unique to each reference profile. The reverse slope shall be in the range 6.7 % to 15 %.

7 Construction method

7.1 Definition of the axes

The Y axis is parallel to the axis of rotation of the wheel with the positive values towards the external face of the wheel. The Z axis is perpendicular to the latter with the positive values towards the outside of the wheel. Their origin is at point D0, situated 70 mm from the internal face of the wheel.

7.2 Base profile

The base profile is that obtained with a flange 32.5 mm thick and 28 mm high. All the others are developed from this fundamental profile.

7.3 Profile construction

7.3.1 Profile zone H2 – D1 (flange)

The reference flange (dimensions, centres and radii) is given in Annex A for a flange thickness of 32.5 mm.

The different flange thicknesses are obtained by translating the zones S-D1, parallel to the Y axis, towards the internal face of the wheel. Annex A gives all the co-ordinates for flange thicknesses between 28.5 mm and 32.5 mm.

After translation, the connection axis (AXB) at the tip of the flange (S) is at a distance, in mm, from the wheel internal face of: $a = 15 - \left(\frac{32{,}5 - e}{2} \right)$

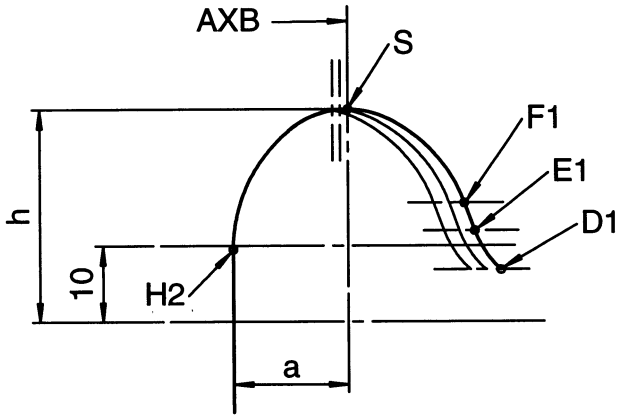


Figure 2 — Flange

7.3.2 Profile connection zone D1 – C1

The characteristics of these connections specific to each profile are given in Annexes B, C and D.

The definitions of the connection zones are shown in Figures 3, 4 and 5.

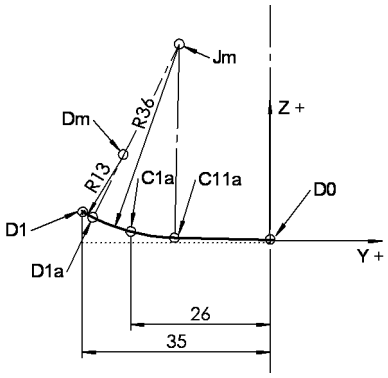


Figure 3 — 1/40th connection zone

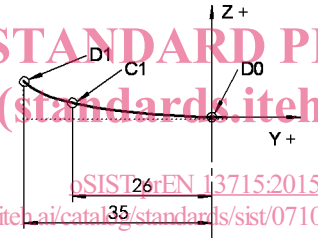


Figure 4 — S1002 connection zone

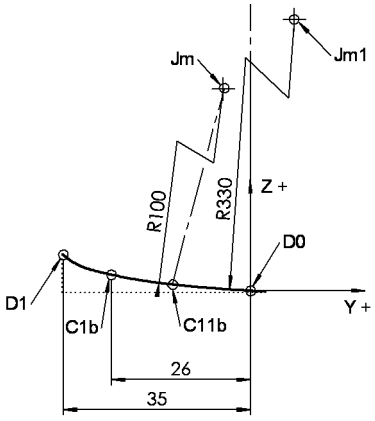


Figure 5 — EPS connection zone