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Railway applications – Track – Rail – Part 3: Check rails

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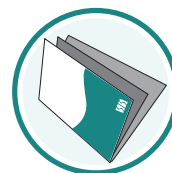
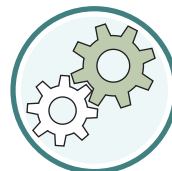
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Denna standard ersätter SS-EN 13674-3:2006, utgåva 1.

The European Standard EN 13674-3:2006+A1:2010 has the status of a Swedish Standard. This document contains the official English version of EN 13674-3:2006+A1:2010.

This standard supersedes the Swedish Standard SS-EN 13674-3:2006, edition 1.

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13674-3:2006+A1

July 2010

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Supersedes EN 13674-3:2006

English Version

Railway applications - Track - Rail - Part 3: Check rails

Applications ferroviaires - Voie - Rails - Partie 3: Contre-rails

Bahnanwendungen - Oberbau - Schienen - Teil 3: Radlenkerschienen

This European Standard was approved by CEN on 13 February 2006 and includes Amendment 1 approved by CEN on 15 May 2010.

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Foreword

This European Standard (EN 13674-3:2006+A1:2010) 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of an identical text or by endorsement, at the latest by January 2011, and conflicting national standards shall be withdrawn at the latest by January 2011.

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 includes Amendment 1 approved by CEN on 15 May 2010.

This document supersedes EN 13674-3:2006.

The start and finish of text introduced or altered by amendment is indicated in the text by tags $\boxed{A_1}$ $\boxed{A_1}$.

$\boxed{A_1}$ This document has been prepared under a mandate given to CEN/CENELEC/ETSI by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2008/57/EC.

For relationship with EU Directive 2008/57/EC, see informative Annex ZA, which is an integral part of this document. $\boxed{A_1}$

This part of EN 13674 is the third of the series EN 13674 *Railway applications — Track — Rail* which consists of the following parts:

- *Part 1: Vignole railway rails 46 kg/m and above;*
- *Part 2: Switch and crossing rails used in conjunction with Vignole railway rails 46 kg/m and above;*
- *Part 3: Check rails;*
- *Part 4: Vignole railway rails from 27 kg/m to, but excluding 46 kg/m.*

$\boxed{A_1}$ Other published standards include the following: $\boxed{A_1}$

- $\boxed{A_1}$ EN 14587-1 $\boxed{A_1}$ *Railway applications — Track — Flash butt welding of rails — Part 1: New R220, R260, R260Mn and R350HT grade rails in a fixed plant;*
- $\boxed{A_1}$ EN 14587-2 $\boxed{A_1}$ *Railway applications — Track — Flash butt welding of rails — Part 2: New R220, R260, R260Mn and R350HT grade rails by mobile welding machines at sites other than at a fixed plant;*
- $\boxed{A_1}$ *deleted text* $\boxed{A_1}$
- $\boxed{A_1}$ EN 14730-1 $\boxed{A_1}$ *Railway applications — Track — Aluminothermic welding of rails — Part 1: Approval of welding processes;*
- $\boxed{A_1}$ EN 14730-2 $\boxed{A_1}$ *Railway applications — Track — Aluminothermic welding of rails — Part 2: Qualification of aluminothermic welders, approval of contractors and acceptance of welds;*

— ^{A1} EN 14811 ^{A1} *Railway applications — Track — Special purpose rail — Grooved and associated construction*;

— ^{A1} EN 15594 ^{A1} *Railway applications — Track — Restoration of rails by electric arc welding*.

^{A1} Another standard planned for publication is:

— prEN 14587-3 *Railway applications — Track — Flash butt welding of rails — Part 3: Welding in association with crossing construction*. ^{A1}

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, Croatia, 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.

1 Scope

This European Standard specifies check rail profiles which have been designed for this purpose. It does not cover guard rails which are to protect vehicle, bridge, viaduct and other structures in the event of a derailment.

Three grades of steel and five rail profiles are specified.

2 Normative references

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

EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method (ISO 6506-1:2005)*

3 Terms and definitions

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

3.1

check rail

rail laid close to the gauge face of a running rail which does not carry a railway wheel but ensures, by guidance of the wheel, the safe passage of both wheels of the axle through small radius curves, switches, crossings by not allowing the flange of either wheel to ride up over the running surface of the running rails

3.2

guard rail

non-running rail mounted either inside or outside the running rail to protect vehicle, bridge, viaduct and other structures in the event of a derailment

3.3

acceptance tests

tests carried out as part of the process and product control system, normally on a heat, sequence or tonnage basis

3.4

running rail

profile that is designed to carry a railway wheel

4 Information to be supplied by the purchaser

The purchaser shall supply the supplier with the following information when inviting tenders to supply:

- a) rail profiles (see Annex A);
- b) steel grades (see Table 1);
- c) lengths of rail.

5 Steel grades

The applicable steel grades are given in Table 1.

The steel names and steel numbers are allocated in accordance with EN 10027-1 and EN 10027-2.

Table 1 — Chemical composition and hardness

A1

Steel grade			% by mass							10 ⁻⁴ % (ppm) max.	HBW ^a	
Steel name	Steel number	Sample	C	Si	Mn	P max	S max	Cr	V max	H		
R200	1.0521	Liquid	0,40/0,60	0,15/0,58	0,70/1,20	0,035	0,035	Not specified ^b		3,5	200/240	
		Solid	0,38/0,62	0,13/0,60	0,65/1,25	0,040	0,040			3,5		
R260	1.0623	Liquid	0,62/0,80	0,15/0,58	0,70/1,20	0,025	0,025			2,5		260/300
		Solid	0,60/0,82	0,13/0,60	0,65/1,25	0,030	0,030			2,5		
R320Cr	1.0915	Liquid	0,60/0,80	0,50/1,10	0,80/1,20	0,020	0,020	0,80/1,20	0,18	2,5	320/360	
		Solid	0,58/0,82	0,48/1,12	0,75/1,25	0,025	0,030	0,75/1,25	0,20	2,5		

^a HBW: Hardness at contact surface.
^b Cr and V not to be added intentionally.

A1

6 Profile drawings/properties/mass

Rail profiles, dimensions, properties and **A1** linear mass **A1** are given in Annex A, Figures A.1 to A.5. Rail transition points are also given in Annex A, Figures A.6 to A.10.

7 Manufacture

7.1 Product integrity

Rails shall be produced under a comprehensive system of factory production control, which shall ensure confidence in the conformity of the finished product. The system shall address this European Standard to ensure that the finished products consistently comply with requirements to achieve the product integrity necessary to provide assurance of product safety in track.

Manufacturers shall demonstrate continuing compliance, including documented evidence, with the factory production control system required.

Manufacturers having a factory production control system, which complies with EN ISO 9001, shall be recognised as satisfying the minimum requirements specified by this clause.

7.2 Identification

The rail shall carry an identification to show the manufacturer the number of the heat, the grade of steel and the rail profile. Cold stamping is not allowed.

8 Acceptance tests

8.1 Chemical composition

Chemical composition limits for these steel grades are given in Table 1.

8.2 Hydrogen

The hydrogen content of the liquid steel shall be measured by determining pressure of hydrogen in the steel using an on-line immersion probe system.

At least two liquid samples shall be taken from the first heat of any sequence using a new tundish and one from each of the remaining heats and analysed for hydrogen content. The first sample from the first heat in a sequence shall be taken from the tundish at the time of the maximum hydrogen concentration.

The heats shall be assessed according to hydrogen content in accordance with Table 2.

The blooms from group 1 heats shall be deemed to be satisfactory.

The blooms from group 2 heats shall be slowly cooled or isothermally treated and all heats shall be tested in the rail form.

Table 2 — Hydrogen content of heats

Heats	Hydrogen content 10 ⁻⁴ % (ppm)	
	Steel grade R200	All other steel grades
Group 1	≤ 3,5	≤ 2,5
Group 2	> 3,5	> 2,5

If the hydrogen contents of the first samples of a first heat or the heat sample of a second or further heat do not comply with the requirements of Table 1 then the blooms made before those samples are taken shall be slowly cooled or isothermally treated. Also all blooms made before the hydrogen content eventually complies with the requirements in Table 1 shall be slowly cooled or isothermally treated.

When testing of rails is required rail samples shall be taken at the hot saw at a frequency of one per heat at random. However on the first heat in a sequence, the rail sample shall be from the last part of a first bloom teemed on any strand. Hydrogen determination shall be carried out on samples taken from the centre of the rail head.

If any test result fails to meet the requirements stated in Table 1 the heat shall be rejected.

8.3 Hardness

Brinell hardness tests shall be carried out on the contact surface in accordance with EN ISO 6506-1, at a frequency of one test per heat. The surface is prepared by grinding off 0,5 mm approximately prior to testing. The hardness values shall meet the requirements shown in Table 1.

NOTE Tensile properties are not required by this European Standard. However, they are generally similar to those of the comparable grades of EN 13674-1.