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Railway applications - Track - Special purpose rail - Grooved and associated construction

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gorge et profils de construction associés

Bahnanwendungen - Oberbau - Speziialschienen -
Rillenschienen und zugehörige Konstruktionsprofile

This European Standard was approved by CEN on 2 June 2006 and includes Amendment 1 approved by CEN on 22 September 2009.

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Foreword

This document (EN 14811:2006+A1:2009) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2010, and conflicting national standards shall be withdrawn at the latest by May 2010.

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 2009-09-22.

This document supersedes EN 14811:2006.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

Other standards on rails include:

EN 13674 *Railway applications — Track — Rail* that comprises 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 46 kg/m.*

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 introduction provides an explanation of the concept and reasoning for preparing this standard. Its description ensures that, during any future revisions, restrictions will be removed if technical progress has been made or will be kept if this is not the case in order that safety is maintained if new manufacturers, products and technologies appear.

The most commonly used delivery conditions in Europe for the supply of grooved rails and associated construction rail profiles have been reviewed during the preparation of this standard. Modern rail production technology and the requirements of commuter railways within the European Union have demanded that the technical requirements for the products specified in EN 14811 be reconsidered.

Whenever possible, this EN 14811 is performance-based. It recognizes the European quality management standard EN ISO 9001 and requires manufacturers to offer the latest proven technology consistently to satisfy the demanding quality of the required product.

The steels are classified according to hardness and not to tensile strength.

The acceptance tests were developed in order to monitor the properties of the grooved rail steels and grooved rails and associated construction rail profiles that are of importance for the production of grooved rails and associated construction rail profiles and which comply with the demands of commuter railways.

The steel grades covered by EN 14811 reflect trends in commuter railway usage and heat-treated rails as well as associated construction rail profiles. This standard contains profiles for grooved rails and associated construction rail profiles for grooved rail facilities having a linear mass of 42 kg/m and above.

To ensure the supply of high quality rails, some restrictions on production processes have been imposed.

This standard is applicable to all procurements covered by the European Procurement Directive (93/38/EEC of 14 June 1993). Additionally, CEN has requested a performance-based standard taking into account safety requirements and the application of the most recent technologies. With respect to the Directive, it is acknowledged that there are (and with respect to safety requirements also shall be) options to deviate from the standard upon agreement between purchaser and manufacturer.

This standard reflects the change in philosophy compared with the traditional content of delivery conditions for grooved rails and associated construction rail profiles. The most frequently used delivery conditions in Europe for the supply of grooved rails and construction rail profiles have been reviewed. All the aspects that are important for the purchasers and manufacturers have been analysed to ensure that the overall contents are particularly appropriate and relevant for the European Standard. For example, the classification of the steel grades of grooved rails and associated construction rail profiles and also other aspects of the European Standard has been based on hardness, not on tensile testing. Whilst the two are directly related, hardness testing is very quick and inexpensive to carry out and provides more relevant guidance to the user, particularly where properties vary in different parts of the profile.

One new aspect of the European Standard is the integration of a clause on quality management and testing in order to assure the product integrity.

In order to ensure that the quality management systems are consistent for all manufacturers and that all purchasers can be sure about the consistency of the product quality of these safety-related components, this standard recommends that the manufacturer operates a quality management system at least equivalent to the requirements of EN ISO 9001. This makes it possible to dispense with detailed requirements on tests and comprehensive testing.

Ideally, manufacturing methods should not be referred to in product standards. However, some rail properties are either not exactly known or cannot be determined with an adequately high statistical reliability. In these cases, as the final possibility, reference is made to manufacturing methods that correspond to best practice. Methods and requirements are specified that offer the maximum probability that the necessary product is obtained in the track. Future technological solutions can increase the list of these requirements but will preferably reduce them.

Examples of where today's technology is taken as the basis, but developments are progressing, are:

- determination of hydrogen content;
- minimum area reduction for rolling of grooved rails and associated construction rail profiles;
- roller straightening effects on contact scrub.

1 Scope

This European Standard specifies requirements for grooved rails and associated construction rail profiles for grooved rail facilities with a linear mass of 42 kg/m and upwards for use in tram transport systems.

NOTE Grooved rails are also used for harbour and industrial tracks.

Six pearlitic steel grades are specified in a hardness range between 200 HBW and 390 HBW. The rails are either non-heat-treated or heat-treated and are made from non-alloyed (C-Mn) steel in both cases.

This standard specifies 18 specific grooved rail profiles and 7 specific construction rail profiles. The grooved rail profiles can also be used as construction elements in switches and crossings.

Two grooved rail classes are specified differing in requirements for profile tolerances.

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.

A1 *deleted text* **A1**

EN 10027-1, *Designation systems for steel — Part 1: Steel names*

EN 10027-2, *Designation systems for steel — Part 2: Steel numbers*

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

A1 EN ISO 6892-1, *Metallic materials - Tensile testing - Part 1: Method of test at room temperature (ISO 6892-1:2009)* **A1**

3 Terms and definitions

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

3.1

heat

liquid steel melt tapped out of a converter or electric arc furnace which after continuous casting includes a given number of blooms relating to the weight of the heat and the extent of the mixing zone. In the case of sequence casting, the blooms belonging to the mixing zone are to be clearly defined

3.2

sequence

number of heats of the same steel grade which undergo continuous casting in a new or repaired tundish. Tundishes may be used in parallel if the caster has many strands

3.3

heat-treated rail

rail that has undergone accelerated cooling from austenitizing temperature during the metallurgical transformation period

3.4

head-hardened grooved rail

grooved rail where the rail head and/or the grooved head has been heat-treated

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