Irish Standard
I.S. EN 13674-2:2006+A1:2010

Railway applications - Track - Rail - Part 2: Switch and crossing rails used in conjunction with Vignole railway rails 46 kg/m and above

I.S. EN 13674-2:2006+A1:2010

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S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

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English Version

Railway applications - Track - Rail - Part 2: Switch and crossing rails used in conjunction with Vignole railway rails 46 kg/m and above

Applications ferroviaires - Voie - Rails - Partie 2: Rails pour appareils de voie utilisés avec des rails Vignole de masse supérieure ou égale à 46 kg/m

Bahnanwendungen - Oberbau - Schienen - Teil 2: Schienen für Weichen und Kreuzungen, die in Verbindung mit Vignolschienen ab 46 kg/m verwendet werden

This European Standard was approved by CEN on 16 January 2006 and includes Amendment 1 approved by CEN on 15 May 2010.

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

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Contents

Page

Foreword

This European Standard (EN 13674-2:2006+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of an identical text or by endorsement, at the latest by January 2011, and conflicting national standards shall be withdrawn at the latest by January 2011.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 13674-2:2006.

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

[A1] 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. ⟨A1]

This part of EN 13674 is the second 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*.

[A1] Other published standards include the following: ⟨A1]

— [A1] EN 14587-1 ⟨A1] *Railway applications — Track — Flash butt welding of rails — Part 1: New R220, R260, R260Mn and R350HT grade rails in a fixed plant*;

— [A1] EN 14587-2 ⟨A1] *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*;

[A1] *deleted text* ⟨A1]

— [A1] EN 14730-1 ⟨A1] *Railway applications — Track — Aluminothermic welding of rails — Part 1: Approval of welding processes*;

— [A1] EN 14730-2 ⟨A1] *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.

Introduction

This introduction provides an explanation of the concepts and reasoning used in the drafting of this European Standard. Its inclusion also ensures that during future revisions, restrictions are removed where technology progresses and held where it does not, thus ensuring continued safety as new manufacturers, products and technologies are introduced.

The most commonly used standards of the world for the supply of railway rails have been reviewed during the preparation of this European Standard. However, modern rail production technology within the European Union has demanded a completely new look at the philosophy and content of this part of EN 13674.

Whenever possible this part of EN 13674 is performance based, recognises the European Quality System standard EN ISO 9001 and requires manufacturers to offer the latest proven technology to consistently satisfy the demanding quality of the required product.

Rail grading is based on hardness rather than tensile strength.

The acceptance tests have been designed to control those characteristics of the rail steel and rail that are of relevance to the production of high quality rails and the demands of the railway.

The steel grades covered by this part of EN 13674 reflect trends in railway usage and heat treated rails are included. The standard includes rail profiles for switch and crossing rails used in conjunction with Vignole rails having a linear mass 46 kg/m and above.

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

This European Standard supersedes other standards covered by the scope. In addition CEN required, where possible, a performance based standard, taking into account safety implications and at the same time addressing modern production technology. It was recognised that there would be few opportunities (and these would have to be for transparent safety considerations) for derogation from this European Standard to operate between the user and the manufacturer.

This European Standard reflects this change in philosophy from the traditional content of rail standards. A review was undertaken of the most commonly used rail standards of the world. All relevant aspects important to both user and manufacturer were considered with the aim of ensuring that all of the content had specific usefulness and relevance. For example rail grading and much of this European Standard has been based on hardness rather than tensile strength. Whilst the two are directly related, hardness is very quick and cheap to carry out and provides more relevant guidance to the user particularly where properties vary in different parts of the profile.

Since many rail manufacturers would not have previously carried out proving trials, the standard includes a prerequisite for all manufacturers to prove conformity against a set of qualifying test criteria at the time of tendering. The qualifying tests include all “normal” acceptance test results plus new ‘type-casting’ features such as fracture toughness, fatigue and residual stress (see EN 13674-1). To provide users with the necessary confidence, acceptance limits have been based on results from rail known to have performed well in demanding track installations.

One aspect of the standard, which is a complete break from tradition, is the inclusion of quality assurance and inspection clause as part of product integrity.

In order that quality management systems are consistent across all manufacturers and that users have the best assurance for the consistency of required product quality on this safety critical component of the track, the rail standard requires that the manufacturer’s quality assurance systems are at least equivalent to the requirements of EN ISO 9001. The inclusion of this requirement also reduces the need to incorporate detailed method and calibration descriptions on items such as normal chemical composition determination and the need to define more extensive testing.

Ideally, manufacturing techniques should not be referenced in a product standard. However, some rail attributes are either not known in an exact manner or are not measurable with satisfactory statistical significance. In such cases best practice manufacturing techniques have been included as a last resort. The equipment specified is that which gives the best probability of achieving the required product for use in track. In the future new technology can add to, but preferably will reduce or delete such items.

Examples of areas where the technological state of the art renders the standard less than complete include:

— oxide/oxygen relationships;

— hydrogen test techniques;

— roller straightening effects on residual stresses;

— roller straightening effects on contact scrub;

— measurement and effect of residual stresses throughout the rail.