

# SVENSK STANDARD

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**Järnvägar – Spår – Brännsvetsning av räler –  
Del 2: Svetsning av nya räler i stålsort R220, R260, R260Mn  
och 350HT med mobil svetsmaskin i ej stationär anläggning**

**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 a fixed plant**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 14587-2**

April 2009

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English Version

**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 a fixed plant**

Applications ferroviaires - Voie - Soudage des rails par étincelage - Partie 2: Rails neufs de nuance R220, R260, R260Mn et R350HT par des machines de soudure mobiles dans des sites autres qu'une installation fixe

Bahnanwendugen - Oberbau - Abbrennstumpfschweißen von Schienen - Teil 2: Abbrennstumpfschweißen neuer Schienen der Stahlsorte R220, R260, R260Mn und R350HT durch mobile Schweißmaschinen an Orten außerhalb eines Schweißwerkes

This European Standard was approved by CEN on 28 February 2009.

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## Foreword

This document (EN 14587-2:2009) 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of an identical text or by endorsement, at the latest by October 2009, and conflicting national standards shall be withdrawn at the latest by October 2009.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 is one of a series of three parts of the EN 14587 "Railway applications – Track – Flash butt welding of rails". The list of parts is as follows:

- Part 1: New R220, R260, R260Mn and R350HT grade rails in a fixed plant;
- Part 2: New R220, R260, R260Mn and R350HT grade rails by mobile welding machines at sites other than a fixed plant;
- Part 3: Welding in association with crossing construction.

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(s).

For relationship with EC Directive(s), 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 EN 14587 has three main topics:

- a) approval procedure for a mobile flash butt welding (MFBW) machine;
- b) approval of the welding contractor;
- c) weld production.

This part of EN 14587 has been occasioned by a European Directive that will permit the freedom of an open European market. To enable this perception to become a reality, it is essential a standard is in place that satisfies the needs of the infrastructure owners or custodians and reflects the production capabilities of the manufacturers in technical and quality terms.

This part of EN 14587 differs from Part 1 significantly due to the peculiarities of a MFBW machine:

- they are used at different places and for different purchasers within a short time;
- they work in various conditions such as weather, rail, track, worksites, power supply, legal regulations;
- they are operated by contractors, but personnel from different companies (including the purchaser) may be on site for the production of the continuous welded track;
- there are technical differences of the equipment used in order to guarantee the required mobility.

Due to the above mentioned special operating conditions of a MFBW machine, the following requirements have been relaxed as a result:

- minimum bend test requirements for production bend tests only;
- maximum permitted trimmed upset.

This part of EN 14587 does not identify any approval of a MFBW machine in terms of electromagnetic compatibility, vehicle braking systems or any requirements regarding load gauge, environment and its attendant issues or infrastructure access pertaining to any railway authority.

## 1 Scope

This European Standard specifies requirements for the approval of a welding process by a MFBW machine at sites other than fixed plant, as well as the welding contractor together with the requirements for subsequent welding production. Where a MFBW machine is to be used in a static but temporary situation, the requirements of this part of the standard shall apply.

It applies to new Vignole R220, R260, R260Mn and R350HT grade rails of 46 kg/m and above, as contained in EN 13674-1, welded by a MFBW machine at sites other than a fixed plant and intended for use on railway infrastructures.

This European Standard applies to the welding of rails into welded strings.

## 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 571-1, *Non destructive testing – Penetrant testing – Part 1: General principles*

EN 1290, *Non-destructive examination of welds – Magnetic particle examination of welds*

EN 13674-1, *Railway applications – Track – Rail – Part 1: Vignole railway rails 46 kg/m and above*

EN 14587-1, *Railway applications – Track – Flash butt welding of rails – Part 1: New R220, R260, R260Mn and R350HT grade rails in a fixed plant*

EN ISO 6507-1, *Metallic materials – Vickers hardness test – Part 1: Test method (ISO 6507-1:2005)*

EN ISO 7500-1, *Metallic materials – Verification of static uniaxial testing machines – Part 1: Tension/compression testing machines – Verification and calibration of the force-measuring system (ISO 7500-1:2004)*

## 3 Terms and definitions

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

### 3.1

#### **fixed plant**

stationary production line for flash butt welding of rails, as specified by EN 14587-1

### 3.2

#### **welding process**

any part of the sequence from the selection of the rail prior to welding through to the finishing of the welded string

### 3.3

#### **upset**

metal extruded around the rail profile as a result of forging

### 3.4

#### **die burn**

damage caused by localised overheating on the surface of the rail caused by poor contact between the rail and the electrode during welding

**3.5**

**trimming**

removal of upset

**3.6**

**trimmed upset**

metal remaining around the rail profile following trimming

**3.7**

**dressing**

removing trimmed upset by grinding or other similar process

**3.8**

**as welded condition**

rails that have been welded and trimmed only

**3.9**

**profile finishing**

operation by which the rail head or relevant part of the rail head at the weld is returned to rail profile

NOTE The operation can be by grinding, milling, planing or any other suitable means.

**3.10**

**finished condition**

welded, trimmed, dressed and profile finished

**3.11**

**flat spot**

process driven discontinuity showing as a small lens-like shape in vertical longitudinal section, or a generally circular/elliptical shape having a localised smooth texture when viewed in a vertical transverse section

**3.12**

**lack of bond**

area of incomplete fusion between the rails in the joint

NOTE This may appear as crack like or line discontinuity at the interface either on the surface after removal of the upset or in a weld section.

**3.13**

**welded string**

long rail comprising a number of shorter rails flash butt welded together

**3.14**

**MFBW machine**

abbreviation for a mobile flash butt welding machine

**3.15**

**purchaser**

purchaser of the welds

**3.16**

**railway authority (RA)**

either the railway regulator or the owner of a railway infrastructure or the custodian with a delegated responsibility for a railway infrastructure

**3.17**

**contractor**

company approved by a RA to provide staff and machinery to execute the production of mobile flash butt welds on that particular infrastructure

NOTE This may include staff and machinery from within the RA.