



SLOVENSKI STANDARD

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Železniške naprave - Infrastruktura - Obnova tirnic z električnim obločnim varjenjem

Railway applications - Infrastructure - Restoration of rails by electric arc welding

Bahnanwendungen - Infrastruktur - Aufarbeitung von Schienen durch elektrisches Lichtbogenschweißen

Applications ferroviaires - Infrastructure - Réparation des rails par soudage à l'arc électrique

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25.160.10	Varilni postopki in varjenje	Welding processes
93.100	Gradnja železnic	Construction of railways

SIST EN 15594:2026

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EUROPEAN STANDARD
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EN 15594

October 2026

ICS 25.160.10

Supersedes EN 15594:2009

English Version

**Railway applications - Infrastructure - Restoration of rails
by electric arc welding**

Applications ferroviaires - Infrastructure - Réparation
des rails par soudage à l'arc électrique

Bahnanwendungen - Infrastruktur - Aufarbeitung von
Schienen durch elektrisches Lichtbogenschweißen

This European Standard was approved by CEN on 3 August 2026.

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EN 15594:2026 (E)**European foreword**

This document (EN 15594:2026) 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of an identical text or by endorsement, at the latest by April 2027, and conflicting national standards shall be withdrawn at the latest by April 2027.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 15594:2009.

This document includes the following significant technical changes with respect to EN 15594:2009:

- normative references have been updated;
- additional rail steel grades have been included;
- microstructure and macrostructure requirements have been updated;
- an Annex ZA has been included.

The purpose of this document is to unify the restoration of rail electric arc welding across Europe. The document provides control systems for the approval and qualification of welding processes, welding procedures, welding consumables, contractors and welders for the successful delivery of welds into track.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

Restoration of rails by electric arc welding is a special process requiring the coordination of welding and grinding activities to establish confidence and reliability of the weld deposit and safety of the line. Controls are to be in place from the design phase through to inspection. Incorrect selection of materials, consumables or procedure can result in serious track welding failure.

It is important to strictly adhere to the correct application of the approved processes and the types of repairs permitted to be carried out on various rail components. Only consumables approved by the method described in this document should be used. The tasks and responsibilities of personnel involved in restoration, e.g. planning, executing, supervising and inspection should be clearly defined.

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EN 15594:2026 (E)**1 Scope**

This document specifies restoration by electric arc welding and is limited to the head of the rails only.

This document describes the approval systems for consumables and procedures used in manual metal arc and flux cored metal deposit rail repair welding. This document includes the quality-related tasks and responsibilities of personnel involved in the electric arc repair welding of rails. This document applies to plain rail and switches and crossings manufactured from new Vignole railway rails R200, R220, R260, R260Mn, and R350HT grades rails of 27 kg/m and above as contained in EN 13674-1, EN 13674-2 and EN 13674-4.

The permitted welding processes are limited to Electric Arc (EA) in accordance with EN ISO 4063 and are by description Process No 111: SMAW (Shielded Metal Arc Welding) and Process No 114: FCAW (Flux Cored Arc Welding).

This document is applicable *in situ*, at line side or at out of track locations. The flash welded leg ends of austenitic manganese steel crossings are included in this document, except when located within 500 mm of manganese crossings. Where repairs are required within 500 mm, refer to EN 16725.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 13674-1:2011+A1:2017, *Railway applications - Track - Rail - Part 1: Vignole railway rails 46 kg/m and above*

EN 13674-4:2019, *Railway applications - Track - Rail - Part 4: Vignole railway rails from 27 kg/m to, but excluding 46 kg/m*

EN 17343:2023, *Railway applications - General terms and definitions*

EN ISO 544:2024, *Welding consumables - Technical delivery conditions for filler materials and fluxes - Type of product, dimensions, tolerances and markings (ISO 544:2024, Corrected version 2026-02)*

EN ISO 3452-1:2021, *Non-destructive testing - Penetrant testing - Part 1: General principles (ISO 3452-1:2021)*

EN ISO 3834-2:2021, *Quality requirements for fusion welding of metallic materials - Part 2: Comprehensive quality requirements (ISO 3834-2:2021)*

EN ISO 6506-1:2014, *Metallic materials - Brinell hardness test - Part 1: Test method (ISO 6506-1:2014)*

EN ISO 6507-1:2023, *Metallic materials - Vickers hardness test - Part 1: Test method (ISO 6507-1:2023)*

EN ISO 9606-1:2017, *Qualification testing of welders - Fusion welding - Part 1: Steels (ISO 9606-1:2012 including Cor 1:2012 and Cor 2:2013)*

EN ISO 15607:2019, *Specification and qualification of welding procedures for metallic materials - General rules (ISO 15607:2019)*

EN ISO 15609-1:2019, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 1: Arc welding (ISO 15609-1:2019)*

EN ISO 15613:2025, *Specification and qualification of welding procedures for metallic materials - Qualification based on a pre-production welding test (ISO 15613:2025)*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in EN 17343:2023 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

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

3.2

contractor

company approved by a railway authority to carry out the restoration of rails by electric arc welding on that infrastructure

3.3

FCAW

flux cored arc welding

3.4

SMAW

shielded metal arc welding

3.5

preliminary welding procedure specification

Pwps

tentative welding procedure specification, which is assumed to be adequate by the manufacturer, but which has not been approved

Note 1 to entry: Welding of test pieces needed for approval of a welding procedure specification shall be carried out based on a preliminary welding procedure specification.

3.6

weld procedure specification

WPS

procedure approved to European standards and agreed by the RA for use on the railway infrastructure

3.7

training establishment

welder training organisation or centre approved by the railway authority or alternatively a welder training organisation or centre approved by and belonging to a railway authority