SLOVENSKI STANDARD
oSIST prEN 15085-5:2020

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Železniške naprave - Varjenje železniških vozil in sestavnih delov - 5. del: Nadzor, preskušanje in dokumentacija

Railway applications - Welding of railway vehicles and components - Part 5: Inspection, testing and documentation

Bahnanwendungen - Schweißen von Schienenfahrzeugen und -fahrzeugteilen - Teil 5: Prüfung und Dokumentation

Applications ferroviaires - Soudage des véhicules et des composants ferroviaires - Partie 5 : Vérification, contrôles et documentations

Ta slovenski standard je istoveten z: **prEN 15085-5**

ICS:

25.160.10	Varilni postopki in varjenje	Welding processes
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English Version

Railway applications - Welding of railway vehicles and components - Part 5: Inspection, testing and documentation

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 256.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 15085-5:2020) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This document is currently submitted to the enquiry.

This document will supersede EN 15085-5:2007.

The main changes compared to EN 15085-5:2007 are:

a) Normative references have been updated;

b) Clause 3, Terms and definitions has been updated;

c) Clause 4, Inspection and testing of welded joints has been revised;

d) Clause 5, Test planning and acceptance criteria has been revised;

e) Clause 6, Documentation has been revised;

f) Clause 7, Non-conformity has been revised;

g) Clause 8, Sub-contractors has been removed;

h) Clause 9, Declaration of conformity has been removed;

i) Clause 10, Traceability has been revised and renamed in Clause 8;

j) Annex A has been removed;

k) Annex ZA has been added.

This series of European Standards EN 15085 “*Railway applications — Welding of railway vehicles and components*” consists of the following parts:

— Part 1: General;

— Part 2: Requirements for welding manufacturers;

— Part 3: Design requirements;

— Part 4: Production requirements;

— Part 5: Inspection, testing and documentation;

— Part 6: Maintenance welding requirements.

Introduction

Welding is a special process in the manufacture of railway vehicles and their parts. The required provisions for this process are laid down in the standards series EN ISO 3834. The basis of these provisions are the basic technical welding standards in respect of the special requirements for the construction of railway vehicles.

This document is aimed at defining the terms of enforcement applicable to European Standards. It is not construed as a substitute to these standards.

This document can also be used by internal and external parties, including certification bodies, to assess the organization's ability to meet customer, regulatory, and the organization's own requirements.

1 Scope

This series of documents applies to welding of metallic materials in the manufacture and maintenance of railway vehicles and their components.

This document specifies:

— inspections and testing to be executed on the welds;

— destructive as well as non-destructive tests to be performed;

— necessary documentation to issue to declare the conformity of the products.

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.

CEN ISO/TR 15608, *Welding — Guidelines for a metallic materials grouping system*

prEN 15085-1:2020, *Railway applications — Welding of railway vehicles and components — Part 1: General*

FprEN 15085-2:2020, *Railway applications — Welding of railway vehicles and components — Part 2: Requirements for welding manufacturers*

prEN 15085-3:2020, *Railway applications — Welding of railway vehicles and components — Part 3: Design requirements*

prEN 15085-4:2020, *Railway applications — Welding of railway vehicles and components — Part 4: Production requirements*

prEN 15085-6:2020, *Railway applications — Welding of railway vehicles and components — Part 6: Maintenance welding requirements*

EN ISO 3834 (all parts), *Quality requirements for fusion welding of metallic materials*

EN ISO 5817, *Welding - Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) - Quality levels for imperfections (ISO 5817:2014)*

EN ISO 9712, *Non-destructive testing - Qualification and certification of NDT personnel (ISO 9712:2012)*

EN ISO 10042, *Welding - Arc-welded joints in aluminium and its alloys - Quality levels for imperfections (ISO 10042:2018)*

EN ISO 17635, *Non-destructive testing of welds - General rules for metallic materials (ISO 17635:2016)*

EN ISO 17637, *Non-destructive testing of welds - Visual testing of fusion-welded joints (ISO 17637:2016)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 15085-1:2020 apply.

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

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Inspection and testing of welded joints

4.1 General

The manufacturer is responsible for the correct implementation of inspection activities according to the requirements of this standard. For maintenance prEN 15085-6:2020 shall also be applied.

The supervision of inspection and testing is in the tasks of the responsible welding coordinator and the welding coordination team, as referred to in Annex A of FprEN 15085-2:2020.

This supervision shall be conducted in a continuous way. It should be documented in specific steps, for example during the execution of periodic internal audits in the welding workshop.

4.2 Inspection and testing before welding

Before beginning any type of welding activity, the welder or welding operator shall check the following items:

— the welding machine is checked and in working order;

— the general conditions of the working area fulfil the requirements (see also prEN 15085-4:2020, Clause 5), e.g. temperature of the environment, correct conditions of the used jigs and fixtures;

— availability of the work instructions and necessary design documents;

— conditions of the weld preparation and the correct tack welds of the parts to be welded (conditions of cleanliness and assembly of the pieces in accordance with the design and/or the WPS);

— identification of the parts to be welded;

— the necessary production weld tests according to prEN 15085-4:2020, 4.2 are done before the start of the daily production, if required (e.g. resistance welding) under the real conditions;

— compliance of the welding consumables with the WPS.

In case of deviation the information shall be transmitted to the responsible person.

4.3 Inspection and testing during welding

The welders or welding operators performing the job shall check and ensure the following:

— adequate cleaning and shape of the joints during the intermediate passes;

— compliance with the prescribed values of the pre-heating and/or interpass temperatures;

— compliance with the WPS and/or work instructions;

— compliance with the sequence of operations if prescribed in specific operating instructions (e.g. the welding sequence plan).

The process steps and phases in which it is necessary for the welding activity to be supervised by the responsible welding coordinator or his deputy shall be explained by welding planning documents (see prEN 15085-4:2020, 4.1).

If the welding sequence plan or test plan requires the check of a weld during production, welding shall be continued only after the weld has been checked.

4.4 Inspection and testing after welding

4.4.1 General

Inspection and testing after welding shall be undertaken by competent personnel. For CT 1 and CT 2 the personnel shall be independent of welding production.

4.4.2 Checks by the welder or welding operator

After welding, the welder or welding operator shall carry out the following checks:

— that the weld is complete;

— that the weld is cleaned;

— that the profile and dimensions of the weld conform to the drawing.

4.4.3 Requirements for visual examination personnel

The following people are considered capable to carry out visual examination on welded joints:

— personnel qualified according to EN ISO 9712 (at the appropriate level according to relevant assigned tasks)

— recognized welding coordinator, only for direct-unaided technique (as defined in EN ISO 9712)

— qualified welding inspector (e.g. E/IWI-C/S), only for direct-unaided technique (as defined in EN ISO 9712)

Confirmation of visual acuity is required.

The following personnel is also considered capable to carry out visual examination on welded joints having inspection class CT 3 and CT 4:

— personnel already qualified according to EN ISO 9712 for other non-destructive testing (PT, MT, UT, RT, ET) when supported by specific training for visual examination in accordance with EN ISO 17637;

— personnel trained in accordance with EN ISO 17637, providing that the following conditions are met:

  — in CT 4, a declaration by manufacturer about training activity shall be available;

  — in CT 3, evidences and documents are required (technical contents and duration of training, system and criteria used for final assessment of knowledge, issuing of an “authorization to operate” document for each individual with relevant duration).

Confirmation of visual acuity is required.

4.4.4 Requirement for other non-destructive examination personnel

All NDT (RT, UT, MT, PT or ET) shall be performed by personnel qualified by examination according to EN ISO 9712, (at the appropriate level according to relevant assigned tasks). Requalification is necessary after five years.

4.4.5 Type and extent of non-destructive testing

Table 1 defines the type and extent of the testing to be carried out during production. This is based on the relationship between the weld performance class of the welded joint assigned by the design engineer and the resulting inspection class (see prEN 15085-3:2020).

The tests described in Table 1 shall be carried out on products manufactured during production in accordance with the frequencies indicated therein and as per the weld performance class specified in the engineering documentation (e.g. on the drawing) by the design department.

The test methods indicated in Table 1 shall be the minimum capable of ensuring compliance of the welded joints. Additional tests depending on materials, design, customer requirements, specific request of the welding coordinator, may be necessary.

In the case of detecting not acceptable imperfections during the tests indicated in Table 1, the procedure for management of non-conformity shall be applied, with the extension of the testing as indicated in Clause 7.

Table 1 — Test to be carried out during production

Inspection class	Volumetric tests RT or UT	Surface tests ET or MT or PT	Visual examination VT
CT 1	100 % [a]	100 %	100 %
CT 2	10 % [a b c]	10 % [b c]	100 %
CT 3	Not required [d]	Not required [d]	100 %
CT 4	Not required	Not required	100 %

The percentages expressed refer to the total length to be examined for one given weld. Thus:

— 100 % means: testing of the entire length of the weld and on all the pieces built;

— 10 % means: testing of 10 % of the entire length of the weld on all the pieces built (sampling in a random manner the part of each weld to be tested) or 100 % testing on 1 of every 10 items built.

[a] Volumetric tests are applicable only for butt welds and T-welds with full penetration.

[b] If volumetric testing is not feasible (because without full penetration or due to limits of thickness or accessibility) for welds of the weld performance class CP B2 or CP C1, 100 % surface testing is required. When five consecutive items are acceptable, surface testing may be reduced to 25 %. A production weld test according to prEN 15085-4:2020 for every welder or welding operator who carries out this weld before the start of the production is necessary.

c In case no FAI is planned, 100 % of test is requested on the initial item (for first article see Clause 4.5)

d On the first item produced additional testing may be requested in critical areas.