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Railway applications – Infrastructure – Aluminothermic welding of grooved rails

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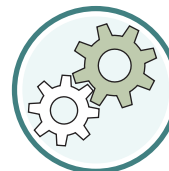
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EUROPEAN STANDARD

EN 16771

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2016

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English Version

Railway applications - Infrastructure - Aluminothermic welding of grooved rails

Applications ferroviaires - Infrastructures - Soudage
par aluminothermie des rails à gorge

Bahnanwendungen - Infrastruktur -
Aluminothermisches Schweißen von Rillenschienen

This European Standard was approved by CEN on 15 July 2016.

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

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SS-EN 16771:2016 (E)

European foreword

This document (EN 16771:2016) 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of an identical text or by endorsement, at the latest by May 2017, and conflicting national standards shall be withdrawn at the latest by May 2017.

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Introduction

This standard defines the approval procedure for aluminothermic welding processes for grooved rail welding through laboratory tests of welds produced in a workshop. This laboratory approval will provide the railway authority with sufficient information for tests in the track if required.

SS-EN 16771:2016 (E)

1 Scope

This standard defines the laboratory tests and requirements for approval of an aluminothermic welding process using welds produced in workshop conditions.

It applies to the joining of new, grooved rails as described in EN 14811 of the same profile and steel grade. Welding of construction profiles and machined profiles are not covered in this standard.

Compliance with the requirements of this standard does not in itself ensure the suitability of a welding process for specific conditions of track and traffic.

The standard does not cover welds made between different rail sections, worn rails or different rail grades.

In addition to the definitive requirements, this standard also requires the items detailed in Clause 4 to be documented. For compliance with this standard, it is important that both the definitive requirements and the documented items be satisfied.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 14811, *Railway applications – Track – Special purpose rail – Grooved and associated construction*

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

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

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

3 Terms and definitions

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

3.1

fusion zone

area of the weld which has been in a liquid state and which is revealed by etching sections cut through the weld

3.2

visible heat-affected zone

HAZ

areas on either side of the fusion zone within the rail steel microstructure has been visibly modified by the heat of the welding process as revealed by Fry macro-etching

3.3

heat softened zone

part of the HAZ (Heat Affected Zone) characterised by a lower hardness

3.4

flashing

flat fin of weld metal located on the rail surface adjacent to the weld collar caused by gaps between the mould and the rail

3.5

surface defect

any defect visible on the weld surface after normal finishing operations

3.6

internal defect

any defect that is revealed by sectioning or on a fracture face following bend testing that has not already been identified as a surface defect

3.7

railway authority

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

3.8

process supplier

company which provides an approved aluminothermic welding process in accordance with this standard

4 Information to be supplied by the railway authority

The following information shall be fully documented by the railway authority. For compliance with the standard both the definitive requirements specified throughout the standard and the following documented items shall be satisfied:

- a) which of the width levels of heat-softened zone is required (7.4.4);
- b) limitations on the pre-heat to comply with the railway authority regulations.

5 Approval procedure

5.1 General

An outline of the steps required for compliance to this standard is given in informative Annex A.

5.2 Process identification

The approval shall involve a single process identified by:

- a) the process name;
- b) a drawing of the pouring system and the casting system;
- c) the characteristic geometry of the weld collar and riser configuration as given in 5.4.2 and Figure 1;
- d) the process manual in accordance with 5.4.1.

5.3 General requirements

The following requirements shall be met:

- a) the process shall be capable of being carried out on track and at or near trackside or in a workshop;