
**Železniške naprave - Zgornji ustroj proge - Aluminotermično varjenje tirnic - 2. del:
Kvalifikacije varilcev, certificiranje izvajalcev in prevzem zvarov**

Railway applications - Track - Aluminothermic welding of rails - Part 2: Qualification of
aluminothermic welders, approval of contractors and acceptance of welds

Bahnanwendungen - Oberbau - Aluminothermisches Schweißen von Schienen - Teil 2:
Qualifizierung aluminothermischer Schweißer, Zertifizierung von Betrieben und Abnahme
von Schweißungen

Applications ferroviaires - Voie - Soudage des rails par aluminothermie - Partie 2 :
Qualification des soudeurs par aluminothermie, agrément des entreprises et réception
des soudures

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Will supersede EN 14730-2:2006

English Version

**Railway applications - Track - Aluminothermic welding of
rails - Part 2: Qualification of aluminothermic welders,
approval of contractors and acceptance of welds**

Applications ferroviaires - Voie - Soudage des rails par
aluminothermie - Partie 2 : Qualification des soudeurs
par aluminothermie, agrément des entreprises et
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Bahnanwendungen - Oberbau - Aluminothermisches
Schweißen von Schienen - Teil 2: Qualifizierung
aluminothermischer Schweißer, Zertifizierung von
Betrieben und Abnahme von Schweißungen

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 14730-2:2019) 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 CEN Enquiry.

This document will supersede EN 14730-2:2006.

This document is the second part of the EN 14730 series which provides systems for the successful delivery of aluminothermic welds in track.

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prEN 14730-2:2019 (E)**Introduction**

This document (prEN 14730-2) has five main topics:

- a) approval of welding trainers;
- b) approval of welding training centres;
- c) qualifications of aluminothermic welders;
- d) approval of aluminothermic welding contractors;
- e) acceptance of welds.

This part of EN 14730 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.

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1 Scope

This document specifies requirements for the:

- approval of training facilities, testing and maintaining the skills of aluminothermic welders and welding trainers. It applies to those aluminothermic welding processes compliant with the requirements of EN 14730-1. It requires that the system for training and testing of welders be approved by the railway authority;
- approval of aluminothermic welding contractors. It applies to those contractors using aluminothermic welding processes compliant with the requirements of EN 14730-1 and who employ welders in the possession of a valid permit to weld as defined in Clause 4 of this standard;
- acceptance of the final aluminothermic weld inspections and aluminothermic weld inspectors approved by the railway authority. It does not cover any previous weld inspections by the welder or others.

This document also applies to aluminothermic welds produced on Vignole railway rail 46 kg/m and above, as contained in EN 13674-1.

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 14730-1, *Railway applications - Track - Aluminothermic welding of rails - Part 1: Approval of welding processes*

kSIST prEN 14730-2:2020

ISO 3834-2, *Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements*

EN ISO 14731, *Welding coordination - Tasks and responsibilities (ISO 14731)*

3 Terms and definitions

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

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

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

3.1

aluminothermic welder

a welder trained in an approved training centre in accordance with Clause 3.7 and holds a permit to weld in accordance with Clause 4.6

3.2

contractor

company approved by a railway authority to provide staff and equipment to execute the production of aluminothermic welds

Note 1 to entry: This may include staff and machinery from within the railway authority

prEN 14730-2:2019 (E)**3.3****employer**

company that employs approved aluminothermic welders

3.4**process manual**

manual produced by the process supplier, it identifies the consumables, equipment and operating method to be followed for all steps of the critical welding parameters

Note 1 to entry: This manual is referred to and described in EN 14730-1

3.5**process supplier**

company that provides an approved aluminothermic welding process and is approved by the railway authority to supply consumables and tools for the execution of aluminothermic welds

Note 1 to entry: This process is accepted in accordance with EN 14730-1

3.6**railway authority**

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

3.7**training centre**

welder training organisation or centre approved by the process supplier and by the railway authority

3.8**weld inspector**

approved and authorised to carry out weld inspections by the railway authority

3.9**welding contractor/sub-contractor**

company approved in accordance with section 5 of this standard

3.10**welding trainer**

qualified and certified trainer approved by the process supplier and authorised by the railway authority

3.11**responsible welding coordinator**

person responsible and competent to perform welding coordination

3.12**examiner**

person qualified by the process supplier and the railway authority to examine knowledge and skills of a welder

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4 Qualification of aluminothermic trainers and welders

4.1 Training requirements

The training and testing shall be conducted in a training centre. The process supplier shall provide the process manual. The training shall be carried out in accordance with the supplier's process manual. In addition to the welding processes the initial training shall include as a minimum:

- basic safety items relating to the process;
- rail identification;
- gas equipment for preheating and cutting;
- abrasive wheels;
- portable powered plant;
- cause and effect of operating outside of the correct procedures;
- weld manufacture;
- basic weld profile grinding;
- visual weld inspection.

4.2 Duration of training

4.2.1 Initial training – no welding experience

The training course duration shall be a minimum of 4 weeks.

This applies to any individual that has no previous welding or track experience.

4.2.2 Training – with previous welding experience

For an individual with documented experience of previous training within a track or welding environment the training course duration shall be confirmed by the either the railway authority or responsible welding coordinator.

All training course content shall be delivered with a minimum of 2 weeks duration.

4.2.3 Training for variations of the welding process

For variations within the same suppliers procedures or conversion to another supplier's procedure the duration of the training and course content shall be confirmed by the training centre.

4.3 Examination

4.3.1 General

All training shall conclude with a practical and theoretical examination to confirm the trainee's ability to carry out the aluminothermic welding of rails in accordance with the requirements of that process supplier's process manual.

The final examination shall take place within 6 months after initial training if not conducted at the end of the initial training course.

prEN 14730-2:2019 (E)**4.3.2 Theoretical test**

The theoretical test shall comprise of a multiple choice test with a minimum of 25 questions. A minimum of 75 % correct answers is necessary to pass the test. It shall also include a minimum number of 5 mandatory questions relating the critical process parameters. All mandatory questions shall be answered correctly by the individual to pass the examination.

4.3.3 Practical test

The welder shall produce a test weld in accordance with the process supplier's process manual. The examiner shall confirm that all process steps have been completed by the welder and if required is in accordance with railway authority criteria. The minimum requirements to be fulfilled by the welder during the practical examination are given in Annex C.

The following tests shall be carried out by the welder on the finished test weld:

- geometry check, test requirements and acceptance criteria according to Clause 6.4;
- weld integrity test, test requirements and acceptance criteria according to Clause 6.5.

4.4 Diploma

Upon successful completion of initial training and examination the welder shall be issued with a diploma in Aluminothermic Welding of Rails by the training centre. The minimum information to be given on the diploma is:

- full name of the welder;
- date of birth;
- date of examination;
- number of diploma;
- issue date;
- welding procedure/supplier;
- cutting methods;
- training centre;
- signature and name of examiner.

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A specimen Diploma in Aluminothermic Welding of Rails showing the format is given an informative Annex A.

The possession of the diploma shall be a pre-requisite to applying for the Permit to Weld.

The diplomas shall remain the property of the welder.

4.5 Permit to Weld

The Permit to Weld shall remain the property of the issuing railway authority and shall not exceed 5 years validity.

The railway authority shall define any relevant condition/s relating to the issue of the permit to weld including as a minimum the application period after initial training, re-training, re-testing, renewal and any additional welding skills.

The welder's employer shall supply the welder with the permit to weld and also maintain up to date records of the welder's performance.

The Permit to Weld shall include a unique identification relating to the particular welder and employer.

In any instance of a welder changing employment to another welding contractor or employer, the railway authority shall issue a new permit to weld. The new permit shall only be issued on receipt of relevant qualifying evidence from the new contractor or employer.

The railway authority can at any time withdraw the permit to weld upon evidence of poor performance by the welder and ask the employer to return it.

The railway authority can also withdraw the permit to weld upon accepted documented notification from the employer. The employer shall return the permit to the railway authority.

Upon request from the employer the permit to weld shall be renewed by the railway authority as it may be necessary to include maintenance and/or extension of the welder's skills. Such a renewal shall require receipt of a valid diploma.

A Permit to Weld example and criteria is shown in the informative Annex B.

4.6 Welder identification

To identify the welder and maintain traceability each and every weld shall be marked by an approved system.

4.7 Welder records

The contractor or employer shall maintain welder records which shall form part of a quality management system. The minimum requirements to be included are:

- welder training and competence;
- weld records; <https://standards.iteh.ai/catalog/standards/sist/26efe294-cc6a-49fb-8ee7-d6ee6162da15/ksist-fprEN-14730-2-2020>
- number of welds produced in a given period;
- number of welds rejected;
- notified number of welds failed in service.

5 Approval of Aluminothermic Welding Contractors

5.1 General

The railway authority shall be responsible for specifying the requirements for the qualification of aluminothermic welding contractors.

A certifying document shall be issued by the railway authority or the authorized body to contractors meeting the requirements.

5.2 Welding Quality Management System

The welding contractor shall operate a welding quality management system according to EN ISO 3834-2 or similar.

When using subcontractors that are not operating according to EN ISO 3834-2, the responsibility for the quality of welding work remains with the responsible welding coordinator for the contractor.