SVENSK STANDARD
SS-EN 17397-1:2020

Järnvägar – Infrastruktur – Rälfel –
Del 1: Hantering av rälfel

Railway applications – Rail defects –
Part 1: Rail defect management

Svenska Institutet för Standarder

Språk: engelska/English
Utgåva: 1

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Fastställd: 2020-11-30
ICS: 14.540;93.100

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Europastandarden EN 17397-1:2020 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 17397-1:2020.

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I dessa anvisningar behandlas huvudprinciperna för hur regler och yttre begränsningar anges i standardiseringsprodukter.

Krav
Ett krav är ett uttryck i ett dokuments innehåll som anger objektivt verifierbara kriterier som ska uppfyllas och från vilka ingen avvikelse tillåts om efterlevnad av dokumentet ska kunna åberopas. Krav uttrycks med hjälpverbet **ska** (eller **ska inte** för förbud).

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En rekommendation är ett uttryck i ett dokuments innehåll som anger en valmöjlighet eller ett tillvägagångssätt som bedöms vara särskilt lämpligt utan att nödvändigtvis nämna eller utesluta andra. Rekommendationer uttrycks med hjälpverbet **bör** (eller **bör inte** för avrådanden).

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Instruktioner anges i imperativ form och används för att ange hur något görs eller utförs. De kan underordnas en annan regel, såsom ett krav eller en rekommendation. De kan även användas självständigt, och är då att betrakta som krav.

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En förklaring är ett uttryck i ett dokuments innehåll som förmedlar information. En förklaring kan uttrycka tillåtelse, möjlighet eller förmåga. Tillåtelse uttrycks med hjälpverbet **får** (eller motsatsen **behöver inte**). Möjlighet och förmåga uttrycks med hjälpverbet **kan** (eller motsatsen **kan inte**).

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These instructions cover the main principles for the use of provisions and external constraints in standardization deliverables.

Requirement
A requirement is an expression, in the content of a document, that conveys objectively verifiable criteria to be fulfilled, and from which no deviation is permitted if conformance with the document is to be claimed. Requirements are expressed by the auxiliary **shall** (or **shall not** for prohibition).

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A recommendation is an expression, in the content of a document, that conveys a suggested possible choice or course of action deemed to be particularly suitable, without necessarily mentioning or excluding others. Recommendations are expressed by the auxiliary **should** (or **should not** for dissuasion).

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An instruction is expressed in the imperative mood and is used in order to convey an action to be performed. It can be subordinated to another provision, such as a requirement or a recommendation. It can also be used independently and is then to be regarded as a requirement.

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A statement is an expression, in the content of a document, that conveys information. A statement can express permission, possibility or capability. Permission is expressed by the auxiliary **may** (its opposite being **need not**). Possibility and capability are expressed by the auxiliary **can** (its opposite being **cannot**).

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 17397-1

November 2020

ICS 93.100

English Version

Railway applications - Rail defects - Part 1: Rail defect management

Applications ferroviaires - Défauts de rails - Partie 1 : Gestion des défauts de rails

Bahnanwendungen - Schienenfehler - Teil 1: Handhabung von Schienenfehlern

This European Standard was approved by CEN on 28 September 2020.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN 17397-1:2020 E

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European foreword

This document (EN 17397-1:2020) 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 2021, and conflicting national standards shall be withdrawn at the latest by May 2021.

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1 Scope

This document specifies the defect management system the infrastructure manager uses to control the risk of severe accidents due to degradation of internal or surface defects on rails complying with EN 13674-1, EN 13674-2, EN 13674-4 and EN 15689:2009 (excluding grooved rails EN 14811 — which need alternative systems).

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 16729-3:2018, *Railway applications - Infrastructure - Non-destructive testing on rails in track - Part 3: Requirements for identifying internal and surface rail defects*

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 https://www.iso.org/obp

3.1
plain rail
zone comprising all parts of the rail located away from the rail ends and the welding zones

3.2
rail end
part of the rail located within the length of the fishplates

3.3
welding zone
weld material itself plus 20 mm from each end of the weld collar (for aluminothermic welding and electric arc welding) or upset (flash-butt welding)

Note 1 to entry: Any defect occurring in this zone is classified as a welding defect.

3.4
defective rail
rail which, for reasons of integrity or profile (including wear), requires management (examples in Annex A)

3.5
damaged rail
rail which is neither cracked nor broken, but which has other defects

3.6
cracked area
part of the rail with a localized material discontinuity

3.7
broken rail
rail which has separated into two or more pieces (see Figure 1 and Figure 2) or any rail from which a piece of metal becomes detached from the rail head, with a gap of more than 50 mm in length and more than 10 mm in depth resulting in a running band less than 30 mm in width (see Figure 3)

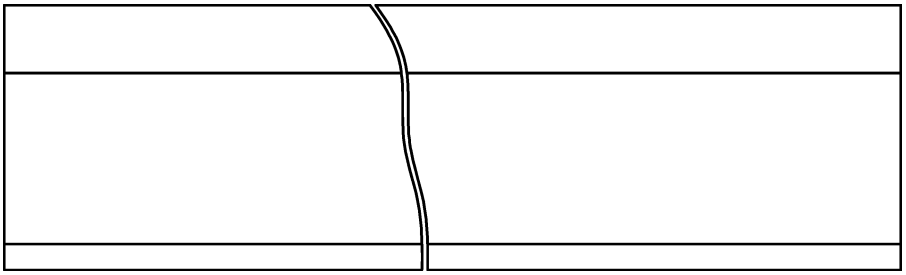
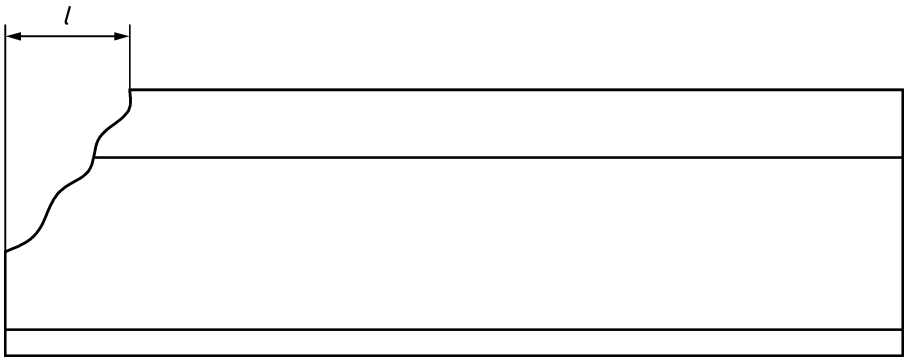
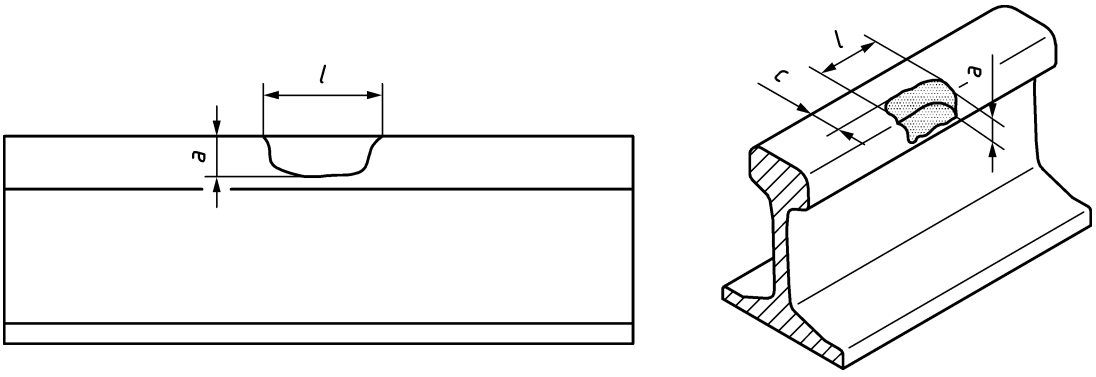


Figure 1 — Example of a broken rail separated in two pieces



Key
l horizontal length

Figure 2 — Example of a broken rail with a gap at the rail end



Key
a vertical depth
l horizontal length
c non-cracked area

Figure 3 — Example of a broken rail with a gap

3.8
rail surface defect
defect which initiates on any of the surfaces of the rail

3.9
rail head surface defect
defect which initiates on or within 5 mm from the running surface of the rail

3.10
rail internal defect
defect which initiates from within the rail section but may grow to become visible on the rail surface

3.11
NDT Method
discipline applying a physical principle in non-destructive testing

[SOURCE: EN 13938-5:2004, definition 3.2]

EXAMPLE: Ultrasonic testing.

3.12
wheel/rail interaction
effect of rolling and sliding contact and direct forces from the vehicle wheels which can cause damage to the rail

3.13
environmental degradation
damage to the rail caused by external environmental factors

3.14
geometrical planes of the rail
see EN 16729-3:2018, 3.10, Figure 4

3.15
infrastructure manager [IM]
body or organisation responsible in particular for establishing and maintaining railway infrastructure, as well as for operating the control and safety systems

3.16
track maintenance engineer [TME]
engineer with “safety of line” responsibility for a defined track area

4 Abbreviations

For the purposes of this document, the following abbreviations apply.

Abbreviation	Definition
RDM	rail defect management
S&C	switches and crossings
TME	track maintenance engineer
IM	infrastructure manager
NDT	non-destructive testing
CWR	continuously welded rail
RAMS	reliability, availability, maintainability, safety
LCC	life cycle costs

5 Defect management system

5.1 General

An infrastructure manager shall put a framework in place to monitor the condition of its assets. If the infrastructure becomes deteriorated, it needs to be renewed or repaired. This can be for economic reasons or, typically at a later state in the development and propagation of the defect, due to safety reasons.

5.2 Defect types

There are a wide variety of rail defects that lead to damaged or defective rail. These defects can be grouped and categorized by a system.

The classification of the defect types along with the internationally widely used numbering scheme can be found in the Annex A of this document.

5.3 NDT inspection of rails

The IM shall implement a testing framework (appropriate NDT methods and inspection frequencies) to inspect rail to detect the defects considered relevant by the IM. The testing frequency should be designed to mitigate the risk that a detectable defect propagates to a critical size leading to failure.

The standard EN 16729-3:2018 describes how several of the most relevant defects can be detected using various methods of NDT.