Literaturhinweise

[1] EN 13231-5:2018, *Bahnanwendungen — Oberbau — Abnahme von Arbeiten — Teil 5: Prozedere zur Schienen-Reprofilierung in Gleisen, Weichen, Kreuzungen und Schienenauszügen*

[2] EN 13674-1, *Bahnanwendungen — Oberbau — Schienen — Teil 1: Vignolschienen ab 46 kg/m*

[3] EN 13674-2, *Bahnanwendungen — Oberbau — Schienen — Teil 2: Schienen für Weichen und Kreuzungen, die in Verbindung mit Vignolschienen ab 46 kg/m verwendet werden*

[4] EN 13674-4, *Bahnanwendungen — Oberbau — Schienen — Teil 4: Vignolschienen mit einer längenbezogenen Masse zwischen 27 kg/m und unter 46 kg/m*

[5] EN 13938-5:2004, *Explosivstoffe für zivile Zwecke — Treibladungspulver und Raketentreibstoffe — Teil 5: Bestimmung von Lunkern und Rissen*

[6] EN 14811, *Bahnanwendungen — Oberbau — Spezialschienen — Rillenschienen und zugehörige Konstruktionsprofile*

[7] EN 15689:2009, *Bahnanwendungen — Oberbau — Weichen und Kreuzungen — Gegossener austenitischer Manganstahl für Herzstückbauteile*

[8] ISO 31000:2018, *Risk management — Principles and guidelines*

– Entwurf –

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 17397-1

June 2019

ICS 93.100

English Version

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

Bahnanwendungen - Infrastruktur - Schienenfehler - Teil 1: Handhabung von Schienenfehlern

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.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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. prEN 17397-1:2019 E

Contents

Page

European foreword

This document (prEN 17397-1:2019) 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.

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 http://www.iso.org/obp

3.1
plain rail
zone comprising all part 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) or upset (flash-butt welding). Any defect occurring in this zone shall be classified as a welding defect

3.4
defective rail
rail that, for reasons of profile (including wear) or integrity, 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 discontinuity of material

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)

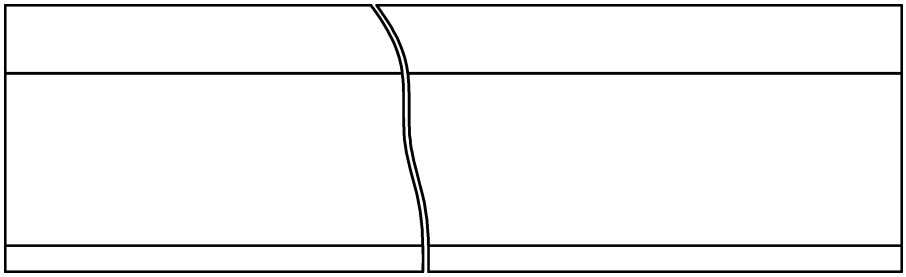
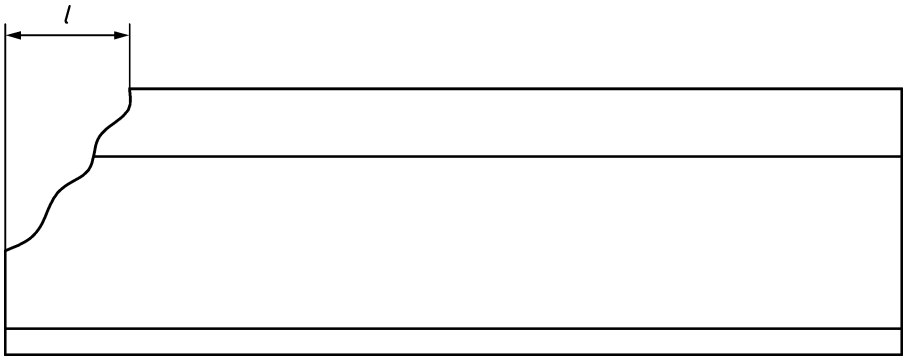


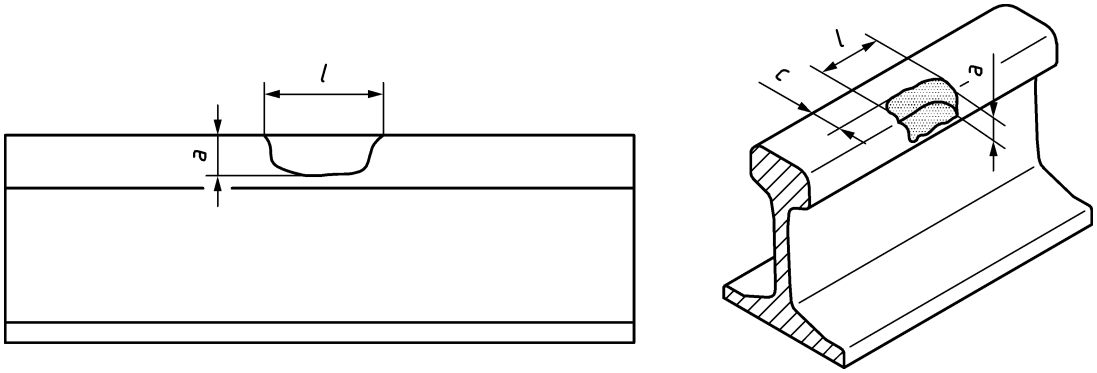
Figure 1 — Broken rail



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 that initiates on or close (within 5 mm) to 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, 08, 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
rail defect management [RDM]
process for the management of defective rails, including defects in switches and crossings, found as a result of inspections or reports

3.16
rail defect management framework
principles outlining and specifying methods to use when assessing and managing defective rails

3.17
rail defect management strategy
railway organisations approach to the management of defective rails

3.18
infrastructure manager [IM]
public body or undertaking responsible in particular for establishing and maintaining railway infrastructure, as well as for operating the control and safety systems

3.19
track maintenance engineer [TME]
engineer with “safety of line” responsibility for a defined track area

4 Symbols and abbreviations

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

Symbol	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, 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 of this standard.

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.

5.4 Management of NDT inspection results

Actions shall be taken depending on the results of the inspection. Several limits can exist that lead to different actions. Immediate action has to be taken, if the defect has reached a safety critical size.