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Railway applications — Infrastructure — Rail fastening systems —

Part 1:
Terms and definitions

Applications ferroviaires — Infrastructure — Systèmes de fixation du rail —

Partie 1: Termes et définitions

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 269, *Railway applications*, Subcommittee SC 1, *Infrastructure*.

A list of all parts in the ISO 22074- series can be found on the ISO website.

Railway applications — Infrastructure — Rail fastening systems —

Part 1: Terms and definitions

1 Scope

This document specifies the terms and definitions used in the ISO 22074- series of standards related to rail fastening systems. The present document includes definitions of various categories of fastenings suitable for application to different track and traffic conditions.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

No terms and definitions are listed in this document.

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 General

In the following list of there are some items where more than one term is listed in the header (e.g. sleeper; tie; cross tie in para 3.3.3). In such cases the first term is the one generally used in the ISO 22074- series of standards. The other terms are also in common use in the railway industry and are considered to be synonymous.

3.2 Terminology for application of standards

3.2.1
rail fastening category
classification of rail fastening based on its ability to meet requirements for a particular combination of the following track and traffic parameters:

— curve radius;

— axle load;

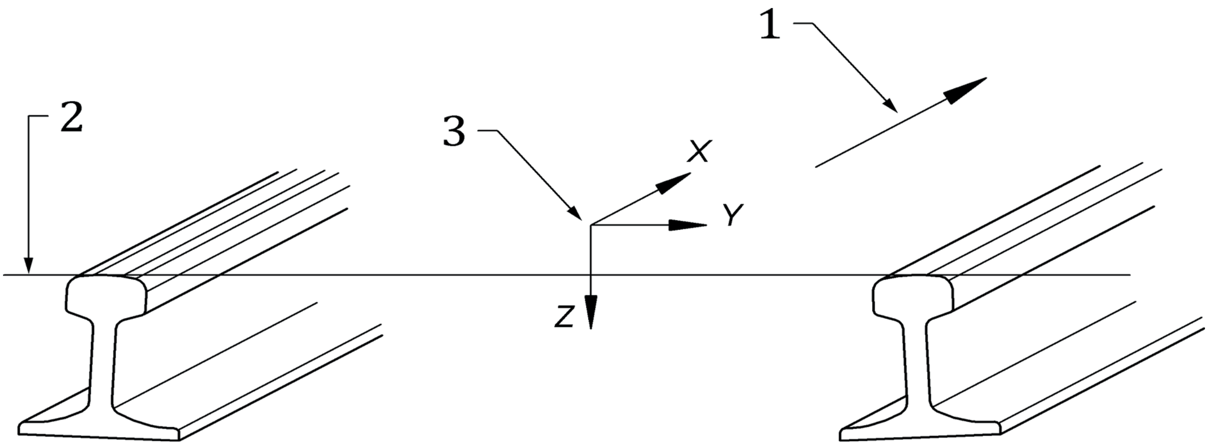
— rail profile;

— track gauge;

— support spacing.

Note 1 to entry: Examples of rail fastening categories are listed in Annex A (informative).

3.2.2
datum line
line defined as item 2 in Figure 1, used as a datum for determination of position and angles of loading applied in tests



Key

1 Running Direction
2 Datum Line defined by the intersection between the considered section and the running surface
3 Co-ordinate system for the track, in which:
X is the longitudinal axis
Y is the lateral axis
Z is the vertical axis

Figure 1 — Determination of datum surface

Note 1 to entry: Figure 1 is taken from FprEN 13848-1:2018.

Note 2 to entry: For conventional concrete, wood and plastic sleepers, this surface is parallel to the bottom surface of the sleeper. For practical purposes, in a test laboratory, the angle of loading may be measured relative to the bottom surface of such a sleeper.

3.3 Track system terms and definitions

3.3.1
ballasted track
railway track in which the *supporting structures* (3.3.5) are *sleepers* (3.3.3) imbedded in ballast

3.3.2
ballastless track
railway track in which the *supporting structure* (3.3.5) has no ballast layer

Note 1 to entry: The term "slab track", used in earlier standards to describe concrete *ballasted track* (3.3.1), is ambiguous and is not used in this series of standards.

3.3.3
sleeper
tie (cross tie)
beam, which may be composite in construction, which supports *running rails* (3.3.6), and sometimes *guard rails* (3.3.8) and *check rails* (3.3.7), at right angles to its axis

Note 1 to entry: Normally the beam supports two running rails to form one track.

3.3.4
bearer
switch tie
beam, which may be composite in construction, which supports *running rails* (3.3.6), and sometimes *guard rails* (3.3.8) and *check rails* (3.3.7), which may not be at right angles to its axis

Note 1 to entry: The beam may support up to six running rails and other components used in switches and crossings.

3.3.5
supporting structure
structural element to which the rail is fastened by means of the *fastening system* (3.4.1)

Note 1 to entry: The supporting structure may be a sleeper, the uppermost concrete surface of *ballastless track* (3.3.2) or steel or concrete elements of an open deck bridge.

3.3.6
running rail
rail which supports the wheels of vehicles moving along the track

3.3.7
check rail
rail laid close to the gauge face of a *running rail* (3.3.6) which takes part in lateral guidance of the wheel and prevents derailment in small radius curved track and switches and crossings

3.3.8
guard rail
rail, laid parallel to a *running rail* (3.3.6), which is intended to control the lateral movement of derailed wheels

3.4 Fastening system definitions

3.4.1
fastening system
rail fastening system
assembly of components which secures a rail to the *supporting structure* (3.3.5) and retains it in the required position whilst permitting any necessary vertical, lateral and longitudinal movement

Note 1 to entry: Such an assembly includes components to distribute the loads from the rail into the supporting structure, and where necessary to prevent wear of the contact surfaces on the supporting structure and to electrically insulate the rail from the supporting structure.

3.4.2
direct fastening system
assembly in which a rail is directly secured to the *supporting structure* (3.3.5) with or without a *baseplate* (3.5.3)

3.4.3
indirect fastening system
assembly in which a rail is secured to a *baseplate* (3.5.3) independently of the fastening of the *baseplate* (3.5.3) to the *supporting structure* (3.3.5)

3.4.4
web support fastening system
assembly in which the principal means of securing the rail to its support is by action on the web of the rail and under the head of the rail

3.4.5
elastic fastening system
resilient fastening system
assembly which is designed to fasten the rail to the *sleeper* (3.3.3) or *supporting structure* (3.3.5) which allows some movement of the rail under applied static or dynamic loads such that the rail returns to its original position once the load is removed

3.4.6
embedded rail
rail which is contained within a channel, filled with inert material

Note 1 to entry: When used with vignole rail, the flange way is maintained alongside the gauge face of the rail and the rail is secured by adhesion of the surrounding material or by mechanical fastenings.

3.4.7
rigid fastening system
assembly which is designed to clamp the rail tightly to the *sleeper* (3.3.3), not allowing any significant movement of the rail, and does not incorporate a resilient component apart from any *rail pad* (3.5.5)

Note 1 to entry: A fully compressed spring washer is not a resilient component.

3.5 Fastening component definitions

3.5.1
rail clip
clip
spring steel element which provides a downward force on the rail foot as a result of elastic deformation

3.5.2
rail clamp
clamp
rail clip (3.5.1) in which the elastic deformation is generated by tightening a screw

3.5.3
baseplate
tie plate
non-elastic component which supports the rail and is secured to the *supporting structure* (3.3.5)

3.5.4
baseplate pad
non-metallic pad placed between *baseplate* (3.5.3) and *supporting structure* (3.3.5) to provide resilience, electrical insulation and/or a comforting surface

3.5.5
rail pad
tie pad
non-metallic pad placed between rail and *baseplate* (3.5.3) or rail and *sleeper* (3.3.3), *bearer* (3.3.4) or slab to provide resilience, electrical insulation and/or a conforming surface

3.5.6
adjustment pad
adjustment shim
metallic or non-metallic pad placed under the rail, *rail pad* (3.5.5), *baseplate* (3.5.3) or *baseplate pad* (3.5.4) for the purpose of adjusting the overall distance between the rail and the *supporting structure* (3.3.5)

3.5.7
active area of rail pad
area of the pad which is directly under the rail

3.6 Terms used to describe characteristics of fastenings

3.6.1
clamping force
vertical force applied to the upper surface of one rail foot by the fastening assembly clips

3.6.2
static stiffness
force per unit deflection measured under a uniaxial static force

3.6.3
vertical stiffness
force per unit vertical deflection measured between the rail and the *supporting structure* (3.3.5), normal to the *datum surface* (3.2.2), between specified minimum and maximum applied loads

3.6.4
lateral stiffness
force per unit lateral deflection measured between the rail foot and the *supporting structure* (3.3.5), parallel to the *datum surface* (3.2.2) between specified minimum and maximum applied loads

3.6.5
uplift stiffness
force per unit vertical displacement measured between the rail foot and *supporting structure* (3.3.5) when the rail is lifted upwards from its normal position in the fastening assembly, but before it contacts any mechanical feature intended to prevent excessive uplift

3.6.6
dynamic stiffness
force per unit deflection measured under a cyclic uniaxial force

3.6.7
low frequency dynamic stiffness
stiffness at typical wheel passing frequency, measured with the load amplitude expected under traffic (typically at a frequency in the range 3 – 30 Hz)

3.6.8
high frequency dynamic stiffness
stiffness at frequencies above 30Hz

3.6.9
vibration attenuation
reduction in transmission of vibration from running and *check rails* (3.3.7) into the supporting structure

3.6.10
noise attenuation
reduction in emission of audible vibration into the surroundings