



BSI Standards Publication

**Railway applications - Infrastructure -
Determination of laboratory test parameters
for assessing the mechanical durability of rail
fastening systems - Complementary element**

National foreword

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The UK participation in its preparation was entrusted to Technical Committee RAE/2, Railway Applications - Track.

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INS, RST and ENE speed conversions	
km/h	mph
5	3
10	5
20	10
30	20
80	50
160	100
190	120

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Date

Text affected

ICS 93.100

English Version

**Railway applications - Infrastructure - Determination
of laboratory test parameters for assessing the
mechanical durability of rail fastening systems -
Complementary element**

Applications ferroviaires - Infrastructure
- Détermination des paramètres d'essai
en laboratoire pour l'évaluation de la
durabilité mécanique des systèmes d'attache
de rails - Élément complémentaire

Bahnanwendungen - Infrastruktur -
Bestimmung von Laborprüfparametern zur
Beurteilung der mechanischen Dauerhaftigkeit
von Schienenbefestigungssystemen

This Technical Report was approved by CEN on 14 December 2018. It has been drawn up by the Technical Committee CEN/TC 256.

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European foreword

This document (CEN/TR 17320:2019) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

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1 Scope

This document presents the technical basis for the loading conditions (the load magnitude, the load angle and the position of load application) to be used when performing the repeated load tests described by EN 13146-4. This basis consists of measurements made in-track, theoretical analysis and experience of using the previous versions of the EN 13481 series. Statistical variations in the applied loads and their influence on safety factors are also considered.

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 13481-1:2012, *Railway applications – Track - Performance requirements for fastening systems – Part 1: Definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13481-1:2012 and the following 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 rail seat

single discrete rail fastening point e.g. a sleeper end or location of a single baseplate

4 Symbols and abbreviations

E	Young's Modulus of the rail steel
F	vertical component of load at a single rail seat
F_{\max}	load carried by the rail seat directly below the wheel
I	second moment of area of the rail for vertical bending
k	stiffness of the ("Winkler") foundation
V	maximum train speed [km/hr]
W	vertical wheel load
a	sleeper or support spacing

5 Purpose

This document has been prepared to provide a reference document that will inform future revisions of the EN 13481 series and other standards that define Performance Requirements for rail fastening systems. Specifically, it provides a basis for calculating the loads that should be applied in the repeated load tests that are performed in laboratories in order to confirm the durability of rail fastening systems according to the method given by EN 13146-4.