



BSI Standards Publication

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

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## National foreword

This Published Document is the UK implementation of CEN/TR 17320:2019.

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

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EN 50153, 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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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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## Contents

Page

European foreword .....	iii
<b>1 Scope .....</b>	<b>4</b>
<b>2 Normative references .....</b>	<b>4</b>
<b>3 Terms and definitions .....</b>	<b>4</b>
<b>4 Symbols and abbreviations .....</b>	<b>4</b>
<b>5 Purpose .....</b>	<b>4</b>
<b>6 History and background .....</b>	<b>5</b>
6.1 ERRI D170 Reports; Evolution of the EN 13481 series .....	5
6.2 System testing v. component testing .....	6
6.3 Design v. actual loads .....	6
6.4 Selection of the appropriate hypothetical load case .....	6
6.4.1 General principles .....	6
6.4.2 Effect of rail inclination .....	7
6.4.3 Sleeper type .....	7
6.5 Safety and dynamic factors .....	7
6.6 Duration of test (3 million cycles) and loading frequency .....	7
6.7 Pass/fail criteria .....	7
6.8 Ballasted v. ballastless track .....	8
<b>7 Assumptions about track construction and maintenance conditions .....</b>	<b>8</b>
<b>8 Input loading at wheel-rail contact point .....</b>	<b>8</b>
8.1 Vertical Loads .....	8
8.2 Lateral loads — Relationship between lateral force and curve geometry .....	9
<b>9 Distribution of loads .....</b>	<b>10</b>
9.1 Vertical loads .....	10
9.2 Lateral loads .....	10
<b>10 Experience in applying the EN 13481:2002 series and EN 13481:2012 series .....</b>	<b>11</b>
<b>11 Recommendations for future development of the EN 13481 series .....</b>	<b>11</b>
<b>Bibliography .....</b>	<b>12</b>

## 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 on 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.