

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

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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.