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Railway applications - Track - Test methods for fastening systems - Part 9: Determination of stiffness

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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English Version

Railway applications - Track - Test methods for fastening systems - Part 9: Determination of stiffness

Applications ferroviaires - Voie - Méthodes d'essai
pour les systèmes de fixation - Partie 9 : Détermination
de la raideur

Bahnanwendungen - Oberbau - Prüfverfahren für
Schienenbefestigungssysteme - Teil 9: Bestimmung der
Steifigkeiten

This European Standard was approved by CEN on 24 February 2020.

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EN 13146-9:2020 (E)

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EN 13146-9:2020 (E)**European foreword**

This document (EN 13146-9:2020) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2020, and conflicting national standards shall be withdrawn at the latest by October 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13146-9:2009+A1:2011.

In this revision of EN 13146-9:2009+A1:2011 the procedures for setting up and calibrating instruments have been brought into line with the requirements in EN 13146-4 and the procedure for high-frequency stiffness testing has been moved into an informative annex.

This document is one of the series EN 13146 *Railway applications — Track — Test methods for fastenings systems*, which consists of the following parts:

- *Part 1: Determination of longitudinal rail restraint;*
- *Part 2: Determination of torsional resistance;*
- *Part 3: Determination of attenuation of impact loads;*
- *Part 4: Effect of repeated loading;*
- *Part 5: Determination of electrical resistance;*
- *Part 6: Effect of severe environmental conditions;*
- *Part 7: Determination of clamping force and uplift stiffness;*
- *Part 8: In-service testing;*
- *Part 9: Determination of stiffness;*
- *Part 10: Proof load test for pull-out resistance.*

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This part of the EN 13146 series brings together test methods for measuring the stiffness of pads and fastening assemblies under static and low-frequency dynamic loading.

Earlier versions of this document included test methods applicable to higher frequencies. These methods are still included in an informative annex.

No method for testing at acoustic frequencies is included. The procedure in EN 15461, which involves testing a length of track incorporating the fastening assemblies under test, is recommended.

EN 13146-9:2020 (E)**1 Scope**

This document specifies laboratory test procedures to determine the static and dynamic stiffness of rail pads, baseplate pads and complete rail fastening assemblies.

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 13146-4, *Railway applications — Track — Test methods for fastening systems — Part 4: Effect of repeated loading*

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

EN ISO 7500-1:2018, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines – Calibration and verification of the force-measuring system (ISO 7500-1:2018)*

EN ISO 9513:2012, *Metallic materials — Calibration of extensometer systems used in uniaxial testing (ISO 9513:2012)*

EN ISO 10846-1:2008, *Acoustics and vibration — Laboratory measurement of vibro-acoustic transfer properties of resilient elements — Part 1: Principles and guidelines (ISO 10846-1:2008)*

ISO 21948, *Coated abrasives — Plain sheets*

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