



SLOVENSKI STANDARD
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Železniška infrastruktura - Sistemi za pritrjevanje tirnic - 8. del: Preskusna metoda za navpično togost (ISO 22074-8:2022)

Railway infrastructure - Rail fastening systems - Part 8: Test method for vertical stiffness (ISO 22074-8:2022)

Bahninfrastruktur - Schienenbefestigungssysteme - Teil 8: Bestimmung der vertikalen Steifigkeiten (ISO 22074-8:2022)

Infrastructure ferroviaire - Systèmes de fixation du rail - Partie 8: Méthode d'essai de la raideur verticale (ISO 22074-8:2022)

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ICS:

45.080	Tračnice in železniški deli	Rails and railway components
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**Railway infrastructure — Rail
fastening systems —**

**Part 8:
Test method for vertical stiffness**

*Infrastructure ferroviaire — Systèmes de fixation du rail —
Partie 8: Méthode d'essai de la raideur verticale*

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of 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 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.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

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

No method for testing at frequencies above 30 Hz is included. Methods for assessing stiffness at higher frequencies can be found in other standards, including EN 15461 and EN 17495.

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Railway infrastructure — Rail fastening systems —

Part 8: Test method for vertical stiffness

1 Scope

This document specifies laboratory test procedures to determine the static and low-frequency 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.

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

ISO 22074-1, *Railway infrastructure — Rail fastening systems — Part 1: Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22074-1 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1

static stiffness

force required to cause a unit displacement of a pad or a rail fastening assembly with the load applied slowly enough to avoid all significant loading rate effects

3.2

low-frequency dynamic stiffness

force required to cause a unit displacement of a pad or a rail fastening assembly with a cyclic load applied at a frequency and force amplitude representative of the loading in railway track associated with passing wheels or bogies

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4 Symbols

F_{SPmax}	reference force applied to pad in measurement of static stiffness of pad, in kN
F_{SP1}	lower limit of force for determining the static secant stiffness of a pad, in kN (approximately equal to the clamping force expected in a fastening system)
F_{SP2}	upper limit of force for determining the static secant stiffness of a pad, in kN
k_{SP}	static stiffness of pad, in MN/m
d_{SP1}	vertical displacement of pad with force F_{SP1} applied, in mm
d_{SP2}	vertical displacement of pad with force F_{SP2} applied, in mm
F_{LFPmax}	reference force for measurement of low-frequency dynamic stiffness of pad, in kN
F_{LFP1}	lower limit of force for determining the low-frequency dynamic stiffness of pad, in kN (approximately equal to the clamping force expected in a fastening system)
F_{LFP2}	upper limit of force for determining the low-frequency dynamic stiffness of pad, in kN
d_{LFP1}	vertical displacement of pad with force F_{LFP1} applied in mm
d_{LFP2}	vertical displacement of pad with force F_{LFP2} applied in mm
f_{LFP}	frequency of measurement of low-frequency measurement dynamic stiffness of pad, in Hz
k_{LFPf}	low-frequency dynamic stiffness of pad at a specific frequency, in MN/m
F_{SAmax}	reference force for measurement of static stiffness of assembly, in kN
k_{SA}	static stiffness of assembly, in MN/m
d_{SA1}	vertical displacement of rail with force F_{SA1} applied, in mm
d_{SA2}	vertical displacement of rail with force F_{SA2} applied, in mm
F_{SA1}	lower limit of force for determining the static secant stiffness of assembly, in kN
F_{SA2}	upper limit of force for determining the static secant stiffness of assembly = 0,8 F_{SAmax} , in kN
k_{LFA}	low-frequency dynamic stiffness of assembly, in MN/m
F_{LFA1}	lower limit of force for determining the low-frequency dynamic stiffness of assembly, in kN
F_{LFA2}	upper limit of force for determining the low-frequency dynamic stiffness of assembly, in kN
F_{LFAmax}	reference force for measurement of low-frequency dynamic stiffness of assembly, in kN
d_{LFA1}	vertical displacement of rail in measurement of low-frequency dynamic stiffness of assembly for force F_{LFA1} , in mm
d_{LFA2}	vertical displacement of rail in measurement of low-frequency dynamic stiffness of assembly for force F_{LFA2} , in mm

5 Verification of calibration

The static calibration of actuators shall be verified in accordance with ISO 7500-1 using equipment having traceability to European or International Standards using the International System of Units (SI).