

# DIN EN 13481-4:2022-11 (E)

## Railway applications - Track - Performance requirements for fastening systems - Part 4: Fastening systems for steel sleepers in ballast

---

<b>Contents</b>		<b>Page</b>
European foreword .....		3
Introduction .....		5
1	Scope .....	6
2	Normative references .....	6
3	Terms and definitions .....	7
4	Symbols .....	9
5	Requirements determined by laboratory testing .....	9
5.1	Specimens used for laboratory testing .....	9
5.2	Longitudinal rail restraint .....	10
5.2.1	General case .....	10
5.2.2	Special case for long structures .....	10
5.3	Torsional resistance .....	10
5.4	Clamping force .....	10
5.5	Pad and assembly stiffness .....	10
5.6	Effect of repeated loading .....	11
5.7	Effect of exposure to severe environmental conditions .....	12
5.8	Electrical resistance .....	12
6	Other requirements .....	12
6.1	Dimensions .....	12
6.2	Effect of fastening system tolerances on track gauge .....	13
6.3	In-service testing .....	14
6.4	Attenuation of noise and vibration .....	14
7	Fitness for purpose .....	15
8	Marking, labelling and packaging .....	15
Annex A (normative) Effect of repeated loading - Steel sleeper configuration .....		16
A.1	Symbols .....	16
A.2	Test arrangement .....	16
A.3	Test report .....	17
Annex B (informative) Vibration and noise .....		18
B.1	General .....	18
B.2	Symbols .....	18
B.3	Parameters for environmental vibration calculations .....	18
B.4	Calculating the vibration attenuation .....	19
B.5	Environmental noise .....	19
Bibliography .....		20