

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

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

---

| Contents   | Page |
|--|------|
| 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   |