
**Railway applications — Polymeric
composite sleepers, bearers and
transoms —**

**Part 2:
Product testing**

*Applications ferroviaires — Traverses et supports en matériaux
composites à matrice polymère —*

Partie 2: Essais de produit

Document Preview

[ISO 12856-2:2020](https://standards.iteh.ai/catalog/standards/iso/423ce12d-808c-406e-9f42-32dac561fb66/iso-12856-2-2020)

<https://standards.iteh.ai/catalog/standards/iso/423ce12d-808c-406e-9f42-32dac561fb66/iso-12856-2-2020>



iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO 12856-2:2020](https://standards.iteh.ai/catalog/standards/iso/423ce12d-808c-406e-9f42-32dac561fb66/iso-12856-2-2020)

<https://standards.iteh.ai/catalog/standards/iso/423ce12d-808c-406e-9f42-32dac561fb66/iso-12856-2-2020>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

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

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and abbreviated terms	1
5 Product characteristics	3
5.1 General.....	3
5.2 Bending resistance.....	3
5.2.1 Test arrangements.....	3
5.2.2 Initial reference test loads.....	10
5.2.3 Test procedures at the centre section for the negative bending moments.....	10
5.2.4 Test procedures at the centre section for the positive bending moments.....	14
5.2.5 Test procedures at the rail seat.....	18
5.3 Tests with geometric ballast plate (GBP) or with flat plate (FP) at rail seat.....	21
5.3.1 Stiffness with GBP or with FP at rail seat.....	21
5.3.2 Compression test with GBP or with FP at rail seat.....	21
5.4 Thermal expansion.....	22
5.4.1 Principle.....	22
5.4.2 Apparatus.....	22
5.4.3 Procedure.....	23
5.5 Interface between the rail and the sleeper.....	24
5.5.1 Permanent deformation of screw/insert as a function of temperature.....	24
5.5.2 Fastening system.....	26
5.5.3 Electrical resistance.....	27
5.5.4 Screw, spike, cast-in and glued-in fastening components.....	27
5.6 Fire.....	27
5.7 System Test.....	27
Annex A (informative) Geometric ballast plate (GBP)	28
Annex B (informative) Test procedures for stiffness measurement of polymeric composite sleeper or bearer with GBP	31
Annex C (informative) Test procedures for stiffness measurement of polymeric composite sleeper with flat plate (FP)	38
Annex D (informative) System test	39
Bibliography	42

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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 12856 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.

Introduction

This document is used as the technical basis for transactions between corresponding parties (purchaser – supplier).

iTeh Standards (<https://standards.itih.ai>) Document Preview

[ISO 12856-2:2020](https://standards.itih.ai/catalog/standards/iso/423ce12d-808c-406e-9f42-32dac561fb66/iso-12856-2-2020)

<https://standards.itih.ai/catalog/standards/iso/423ce12d-808c-406e-9f42-32dac561fb66/iso-12856-2-2020>

Railway applications — Polymeric composite sleepers, bearers and transoms —

Part 2: Product testing

1 Scope

This document specifies various test methods to ensure the performance of polymeric composite and reinforced polymeric composite sleepers, bearers and transoms for use in tracks. It is applicable to the sleepers, bearers and transoms to be installed in tracks with or without a ballast.

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, *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 12856-3:—¹⁾, *Railway applications — Polymeric composite sleepers, bearers and transoms — Part 3: General requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12856-3 apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Symbols and abbreviated terms

For the purposes of this document, the symbols and abbreviated terms listed in [Table 1](#) apply.

Table 1 — Symbols

Symbol/ Abbreviated term	Description	Unit
C_{dyn}	low frequency dynamic bedding modulus of polymeric composite sleeper or bearer measured with GBP	N/mm ³
C_{max}	static bedding modulus of polymeric composite sleeper or bearer measured with geometric ballast plate (GBP)	N/mm ³
$d_{\text{fat,lim}}$	acceptable displacement of fatigue test as a maintenance policy	mm
d_{0c}	deformation of the sleeper in the compression test under F_{r0}	mm

1) Under preparation. Stage at the time of publication: ISO/DIS 12856-3:2020.