BSI Standards Publication

Railway Applications — Rolling Stock — Specification and verification of energy consumption

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National foreword

This British Standard is the UK implementation of EN 50591:2019. It supersedes PD CLC/TS 50591:2013, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/9/2, Railway Electrotechnical Applications - Rolling stock.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Railway Applications - Rolling Stock - Specification and verification of energy consumption

Applications ferroviaires - Spécification et vérification de la consommation d'énergie pour le matériel roulant ferroviaire

Bahnanwendungen - Fahrzeuge - Spezifikation und Überprüfung des Energieverbrauchs

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European Committee for Electrotechnical Standardization
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European foreword

This document (EN 50591:2019) has been prepared by CLC/SC 9XB “Electrical, electronic and electromechanical material on board rolling stock, including associated software” with contribution of UNIFE-UIC TECREC 100_001.

The following dates are fixed:

— latest date by which the existence of this document has to be announced at national level	(doa)	2019-11-02
— latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2020-02-02
— latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2022-08-02

This document supersedes CLC/TS 50591:2013.

The main changes in this edition compared to CLC/TS 50591:2013 are the adoption of existing CLC/TS 50591 enquiry comments, the harmonization with results from the European Lighthouse Project Roll2Rail and the inclusion of an HVAC energy quantification method. Since separate methods for traction and HVAC energy quantification are described, the document structure had to be revised.

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This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

1 Scope

The purpose of this document is to support rolling stock procurement, especially life cycle cost (LCC) assessment.

This document is applicable to the specification and verification of energy consumption of railway rolling stock. It establishes a criterion for the energy consumption of rolling stock to calculate the total net energy consumed, either at current collector or from the fuel tank, over a predefined service profile, to ensure that the results are directly comparable or representative of the real operation of the train. For this purpose, this document considers the energy consumed and regenerated by the rolling stock. The determination methods covered are the simulation and the measurement.

This document provides the framework that gives guidance on the generation of comparable energy performance values for trains and locomotives on a common basis and thereby supports benchmarking and improvement of the energy efficiency of rail vehicles.

This document does not cover the comparison of energy consumption with other modes of transportation, or even for comparison between diesel and electric traction, covering only the energy consumption of the railway rolling stock itself.

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 13129:2016, *Railway applications – Air conditioning for main line rolling stock – Comfort parameters and type tests*

EN 15663:2017+A1:2018, *Railway applications – Vehicle reference masses*

EN 50163:2004, *Railway applications – Supply voltages of traction systems*

EN 50388:2012, *Railway Applications – Power supply and rolling stock – Technical criteria for the coordination between power supply (substation) and rolling stock to achieve interoperability*

EN 50463-1:2017, *Railway applications – Energy measurement on board trains – Part 1: General*

EN 50463-2:2017, *Railway applications – Energy measurement on board trains – Part 2: Energy measuring*

UIC leaflet 552, *Electrical power supply for trains – Standard technical characteristics of the train line* (10th edition, June 2005)

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

NOTE When possible, the following definitions have been taken from the relevant chapters of the International Electrotechnical Vocabulary (IEV), IEC 60050. In such cases, the appropriate IEV reference is given. Certain new definitions or modifications of IEV definitions have been added in this standard in order to facilitate