

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Railway applications – Electromagnetic compatibility –
Part 3-1: Rolling stock – Train and complete vehicle**

**Applications ferroviaires – Compatibilité électromagnétique –
Partie 3-1: Matériel roulant – Trains et véhicules complets**



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RAILWAY APPLICATIONS –
ELECTROMAGNETIC COMPATIBILITY –****Part 3-1: Rolling stock – Train and complete vehicle****FOREWORD**

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International Standard IEC 62236-3-1 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

This third edition cancels and replaces the second edition published in 2008. It constitutes a technical revision and has been developed on the basis of EN 50121-3-1:2015.

This edition includes the following significant technical changes with respect to the previous edition:

- a) clarification of scope (Clause 1);
- b) clarification of definitions (Clause 3);
- c) clarification of applicability (Clause 4);
- d) clarification of interference on outside party telecommunication lines (6.2), psophometric current (Annex A);

- e) moving emission values for radiated H-field in the frequency range 9 kHz to 150 kHz into new Annex C due to the fact that:
- there are very few outside world victims (e.g. radio services),
 - the radiated emission measured at 10 m is not representative of the compatibility with internal railway apparatus,
 - the EMC with other railway apparatus in this frequency range is covered in other procedures and standards like IEC 62427 series,
 - there is low reproducibility.

This International Standard is to be read in conjunction with IEC 62236-1.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
9/2337/FDIS	9/2367/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62236 series, published under the general title *Railway applications – Electromagnetic compatibility*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

High powered electronic equipment, together with low power microcontrollers and other electronic devices, is being installed on trains in great numbers. Electromagnetic compatibility has therefore become a critical issue for the design of train-related apparatus as well as of the train as a whole.

This Product Standard for rolling stock sets limits for electromagnetic emission and immunity in order to ensure a well functioning system within its intended environment.

Immunity limits are not given for the complete vehicle. Part 3-2 of this series defines requirements for the apparatus installed in the rolling stock, since it is impractical to test the complete unit. An EMC plan includes equipment covered by this document.

RAILWAY APPLICATIONS – ELECTROMAGNETIC COMPATIBILITY –

Part 3-1: Rolling stock – Train and complete vehicle

1 Scope

This part of IEC 62236 specifies the emission and immunity requirements for all types of rolling stock. It covers traction stock, hauled stock and trainsets including urban vehicles for use in city streets. This document specifies the emission limits of the rolling stock to the outside world.

The scope of this document ends at the interface of the rolling stock with its respective energy inputs and outputs. In the case of traction units, trainsets, trams, etc., this is the current collector (pantograph, shoe gear). In the case of hauled stock, this is the AC or DC auxiliary power connector. However, since the current collector is part of the traction stock, it is not entirely possible to exclude the effects of this interface with the power supply line. The slow moving test has been designed to minimize these effects.

There may be additional compatibility requirements within the railway system identified in the EMC plan (e.g. as specified in IEC 62427).

Electromagnetic emissions of the railway system as a whole are dealt with in IEC 62236-2.

These specific provisions are used in conjunction with the general provisions in IEC 62236-1.

The frequency range considered is from 0 Hz (DC) to 400 GHz. No measurements need to be performed at frequencies where no requirement is specified.

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.

IEC 62236-1:2018, *Railway applications – Electromagnetic compatibility – Part 1: General*

IEC 62236-2:2018, *Railway applications – Electromagnetic compatibility – Part 2: Emission of the whole railway system to the outside world*

IEC 62236-3-2:2018, *Railway applications – Electromagnetic compatibility – Part 3-2: Rolling stock – Apparatus*

CISPR 16-1-1:2015, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*