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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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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 second edition cancels and replaces the first edition published in 2003. It constitutes a technical revision and is based on EN 50121-3-1:2006.

The main change with respect to the previous edition is listed below:

– incorporation of emission limits for urban vehicles operating in city streets.

The text of this standard is based on the following documents:

FDIS	Report on voting
9/1186/FDIS	9/1214/RVD

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

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

A list of all parts of 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 publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

INTRODUCTION

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 standard defines requirements for the apparatus installed in the rolling stock, since it is impractical to test the complete unit. An EMC plan should be established for equipment covered by this part of IEC 62236.

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 and trainsets including urban vehicles for use in city streets.

The frequency range considered is from d.c. to 400 GHz. No measurements need to be performed at frequencies where no requirement is specified.

The scope of this standard ends at the interface of the rolling stock with its respective energy inputs and outputs. In the case of locomotives, trainsets, trams, etc. this is the current collector (pantograph, shoe gear). In the case of hauled stock, this is the a.c. or d.c. 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 minimise these effects.

Basically, all apparatus to be integrated into a vehicle should meet the requirements of Part 3-2 of this standard. In exceptional cases, where apparatus meets another EMC standard, but full compliance with Part 3-2 is not demonstrated, EMC should be assured by adequate integration measures of the apparatus into the vehicle system and/or by an appropriate EMC analysis and test which justifies deviating from Part 3-2.

The electromagnetic interference concerning the railway system as a whole is dealt with in IEC 62236-2.

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

2 Normative references

The following referenced documents are indispensable for the application 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, *Railway applications – Electromagnetic compatibility – Part 1: General*

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

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

IEC 62427, *Railway applications – Compatibility between rolling stock and train detection systems*

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

ITU-T, *Directive concerning the protection of telecommunication lines against harmful effects from electrical power and electrified railway lines – Volume VI: Danger and disturbances*

3 Terms and definitions

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

3.1
traction stock
electric and diesel locomotives, high speed trainsets, electric and diesel multiple units (no locomotive, each coach has its own traction equipment) for main line vehicles, Light Railway Vehicles (LRV) such as underground trainsets, trams, etc., for urban vehicles

3.2
hauled stock
all independent passenger coaches and freight wagons (if they contain electric apparatus such as freezing equipment) which may be hauled in random combinations by different types of locomotives

3.3
main line vehicles
vehicles such as high speed trains, suburban trains, freight trains, mainly designed to operate between cities

3.4
urban vehicles
vehicles such as underground trainsets, trams, LRV (Light Rail Vehicles), trolleybuses, mainly designed to operate within the boundary of a city

4 Applicability

Generally, it is not possible to test electromagnetic compatibility invoking every function of the stock. The tests shall be made at typical operating modes considered to produce the largest emission.

The configuration and mode of operation shall be specified in the test plan and the actual conditions during the tests shall be precisely noted in the test report.

5 Immunity tests and limits

No tests are applied to the complete vehicle, but the immunity tests and limits in Part 3-2 of this standard were selected in the knowledge that the vehicle can be deemed to be immune to a level of 20 V/m over the frequency range 0,15 MHz to 2 GHz. It is expected that the assembly of the apparatus into a complete vehicle will give adequate immunity, provided that an EMC plan has been prepared and implemented, taking into account the limits in Part 3-2 of this standard.