# IEC 62236-2

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# INTERNATIONAL STANDARD

colour inside

## Railway applications – Electromagnetic compatibility – Part 2: Emission of the whole railway system to the outside world

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# RAILWAY APPLICATIONS – ELECTROMAGNETIC COMPATIBILITY –

## Part 2: Emission of the whole railway system to the outside world

## FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62236-2 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 50121-2:2015.

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

a) clarification of scope (Clause 1);
b) combination of former Clause 5 and Annex A related to method of measurement for moving trains and traction substations (5.1);
c) moving emission values for radiated H-fields in the frequency range 9 kHz to 150 kHz to new Annex C due to the fact that:
   – there are very few outside world victims;
   – there is low reproducibility.
d) clarification of acquisition method (5.2).

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 |
|---|---|
| 9/2336/FDIS | 9/2366/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.

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

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

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# RAILWAY APPLICATIONS – ELECTROMAGNETIC COMPATIBILITY –

## Part 2: Emission of the whole railway system to the outside world

## 1 Scope

This part of IEC 62236 ~~sets~~ is intended to define the ~~emission limits from~~ electromagnetic environment of the whole railway system including urban ~~vehicles for use in city streets~~ mass transit and light rail system. It describes the measurement method to verify the emissions, and gives the cartography values of the fields most frequently encountered.

This document specifies the emission limits of the whole railway system to the outside world.

The ~~limits~~ emission parameters refer to the particular measuring points defined in Clause 5 ~~and Annex A~~. These emissions ~~should be~~ are assumed to exist at all points in the vertical planes which are 10 m from the centre lines of the outer electrified railway tracks, or 10 m from the fence of the substations.

Also, the zones above and below the railway system may be affected by electromagnetic emissions and particular cases ~~shall be~~ are considered individually.

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

For existing railway lines, it is assumed that compliance with the emission requirements of IEC 62236-3-1, IEC 62236-3-2, IEC 62236-4 and IEC 62236-5 will ensure the compliance with the emission values given in this document.

For newly built railway systems, it is best practice to provide compliance to the emission limits given in this document (to be defined in the EMC plan according to IEC 62236-1).

## 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 60050-161, International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility (EMC)*~~

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

~~*IEC 62236-3-1, Railway applications – Electromagnetic compatibility – Part 3-1: Rolling stock – Train and complete vehicle*~~

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*

CISPR 16-1-4:2010, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Antennas and test sites for radiated disturbance measurements*
CISPR 16-1-4:2010/AMD1:2012
CISPR 16-1-4:2010/AMD2:2017

~~CISPR 22, *Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement*~~

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# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

## Railway applications – Electromagnetic compatibility – Part 2: Emission of the whole railway system to the outside world

## Applications ferroviaires – Compatibilité électromagnétique – Partie 2: Émission du système ferroviaire dans son ensemble vers le monde extérieur

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# RAILWAY APPLICATIONS – ELECTROMAGNETIC COMPATIBILITY –

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## Part 2: Emission of the whole railway system to the outside world

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This part of IEC 62236 is intended to define the electromagnetic environment of the whole railway system including urban mass transit and light rail system. It describes the measurement method to verify the emissions, and gives the cartography values of the fields most frequently encountered.

This document specifies the emission limits of the whole railway system to the outside world.

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CISPR 16-1-4:2010/AMD2:2017

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# APPLICATIONS FERROVIAIRES – COMPATIBILITÉ ÉLECTROMAGNÉTIQUE –

## Partie 2: Émission du système ferroviaire dans son ensemble vers le monde extérieur

## AVANT-PROPOS

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La Norme internationale IEC 62236-2 a été établie par le comité d'études 9 de l'IEC: Matériels et systèmes électriques ferroviaires.

Cette troisième édition annule et remplace la deuxième édition publiée en 2008. Elle constitue une révision technique et a été développée sur la base de EN 50121-2:2015.

Cette édition inclut les changements techniques significatifs suivants par rapport à l'édition précédente:

a) clarification du domaine d'application (Article 1);
b) combinaison de l'Article 5 et de l'Annexe A liée à la méthode de mesurage pour les trains en mouvement et les sous-stations de traction (5.1);

c) déplacement des valeurs d'émissions pour les champs H rayonnés de largeurs de bande 9 kHz à 150 kHz dans l'Annexe C pour les raisons suivantes:
   – il y a très peu de victimes du monde extérieur;
   – la reproductibilité est faible;
d) clarification de la méthode d'acquisition (5.2).

Cette Norme internationale doit être lue conjointement avec l'IEC 62236-1.

Le texte de cette Norme internationale est issu des documents suivants:

| FDIS | Rapport de vote |
|---|---|
| 9/2336/FDIS | 9/2366/RVD |

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Une liste de toutes les parties de la série IEC 62236, publiées sous le titre général *Applications ferroviaires – Compatibilité électromagnétique*, peut être consultée sur le site web de l'IEC.

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# APPLICATIONS FERROVIAIRES – COMPATIBILITÉ ÉLECTROMAGNÉTIQUE –

# Partie 2: Émission du système ferroviaire dans son ensemble vers le monde extérieur

## 1 Domaine d'application

La présente partie de l'IEC 62236 est destinée à définir l'environnement électromagnétique de l'ensemble du système ferroviaire, y compris les systèmes de transport en commun urbain et de réseau ferré léger. Elle décrit la méthode de mesure à utiliser pour vérifier les émissions et donne la cartographie des niveaux de champ rencontrés le plus fréquemment.

Le présent document spécifie les limites d'émission de l'ensemble du système ferroviaire vers le monde extérieur.

Les paramètres d'émission se réfèrent aux points de mesure particuliers définis à l'Article 5. Il est considéré que ces émissions existent en tout point dans les plans verticaux situés à 10 m des lignes centrales des voies de chemin de fer électrifiées en zone extérieure ou à 10 m de la clôture des sous-stations.

Les zones situées au-dessus et en dessous du système ferroviaire peuvent également être affectées par des émissions électromagnétiques et les cas particuliers sont pris en compte de manière individuelle.

Ces dispositions spécifiques sont utilisées avec les dispositions générales données dans l'IEC 62236-1.

Pour les voies de chemin de fer existantes, la conformité aux exigences d'émission des normes IEC 62236-3-1, IEC 62236-3-2, IEC 62236-4 et IEC 62236-5 est considérée garantir la conformité aux valeurs d'émission indiquées dans le présent document.

Pour les systèmes ferroviaires récemment construits, il est préférable de garantir la conformité aux limites d'émission indiquées dans le présent document (à définir dans le plan CEM conformément à l'IEC 62236-1).

## 2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 62236-1:2018, *Applications ferroviaires – Compatibilité électromagnétique – Partie 1: Généralités*

CISPR 16-1-1:2015, *Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Partie 1-1: Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques — Appareils de mesure*

CISPR 16-1-4:2010, *Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Partie 1-4:*

*Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Antennes et emplacements d'essai pour les mesures des perturbations rayonnées*
CISPR 16-1-4:2010/AMD1:2012
CISPR 16-1-4:2010/AMD2:2017