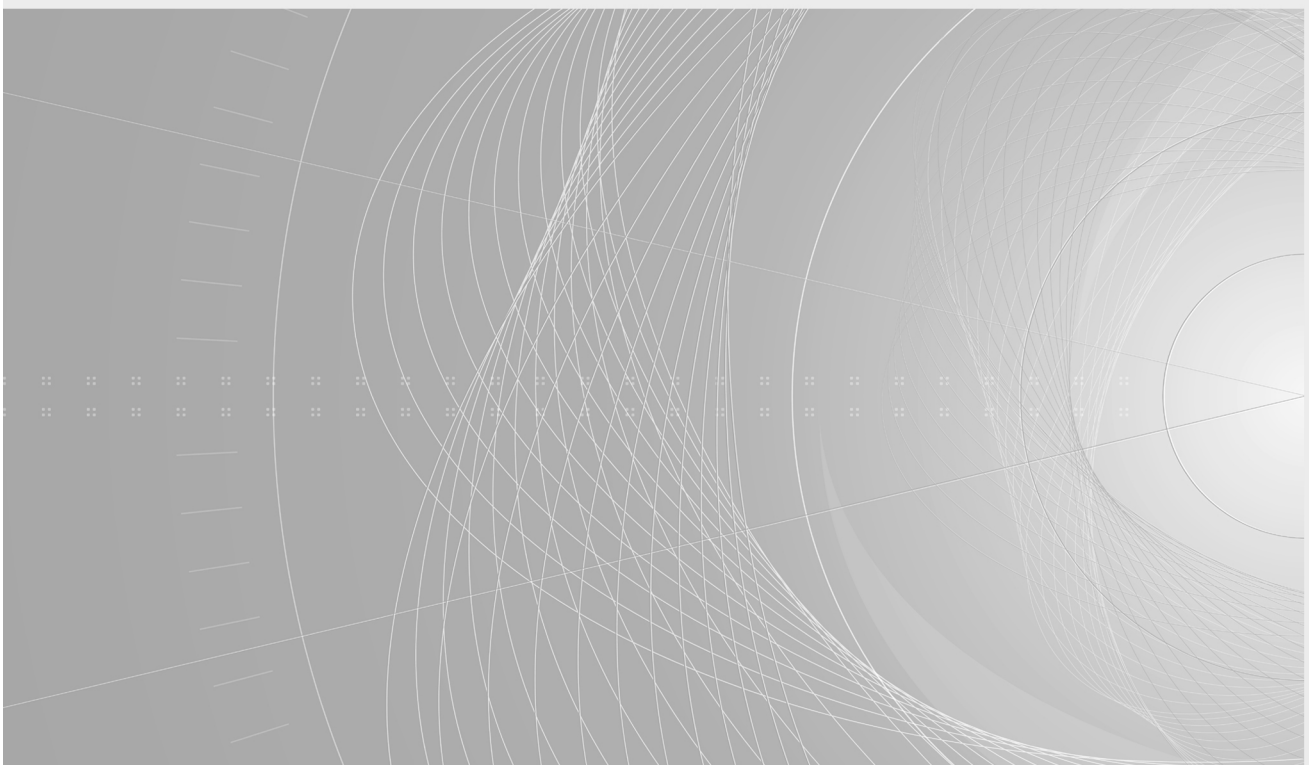


INTERNATIONAL STANDARD

NORME INTERNATIONALE

Railway applications – Compatibility between rolling stock and train detection systems

Applications ferroviaires – Compatibilité entre matériel roulant et systèmes de détection de train





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CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	8
2 Normative references	8
3 Terms and definitions	8
4 Acceptance process	11
4.1 Overview	11
4.2 Responsibilities	11
4.3 Acceptance process	12
4.4 Compatibility case	14
4.5 Quality management	14
4.6 Route identification.....	15
4.7 Characterisation	15
4.8 Tests.....	15
4.9 Compatibility analysis.....	15
4.10 Certificate of acceptance	16
5 Characterisation of train detection systems	17
5.1 Objective of procedure	17
5.2 Physical compatibility	17
5.3 Electromagnetic compatibility	18
5.4 Factor of safety	21
5.5 Track circuit susceptibility	21
5.6 Wheel detector susceptibility	22
5.7 Train detection system gabarit.....	22
5.8 Interference signal generated by rolling stock and substations	22
5.9 Characterisation report.....	23
6 Characterisation of rolling stock.....	24
6.1 Objectives of procedure.....	24
6.2 Description of rolling stock and factors affecting its characteristics.....	24
6.3 Configuration (design status).....	24
6.4 Test plan	25
6.5 Test report	26
6.6 Archive of test results.....	27
7 Characterisation of traction power supply systems	27
7.1 Objective.....	27
7.2 DC traction power supplies.....	27
7.3 AC traction power supplies.....	28
Annex A (informative) Guidelines for the determination of susceptibility of train detection systems	29
Annex B (informative) Guidelines for the measurement of rolling stock characteristics.....	37
Annex C (informative) Factors affecting rolling stock characteristics	39
Annex D (informative) DC traction power supplies	40
Annex E (informative) AC traction power supplies.....	42

Bibliography.....	45
Figure 1 – Sources of electromagnetic interference	6
Figure 2 – Parties concerned in the acceptance process.....	11
Figure 3 – Acceptance process	13
Figure 4 – Relationship between gabarit and permissible interference	16
Figure A.1 – Interference mechanism with rails intact	29
Figure A.2 – Interference mechanism with self-revealing broken rail	29
Figure A.3 – Interference mechanism with unrevealed broken rail.....	30
Figure A.4 – Double rail track circuit	30
Figure A.5 – Double rail track circuit with broken rail.....	31
Figure A.6 – Interference mechanism due to voltage between axles – Case 1.....	31
Figure A.7 – Interference mechanism due to voltage between axles – Case 2.....	32
Figure A.8 – Effect of inter-vehicle current	32
Figure A.9 – Equivalent circuit for Figure A.8	33
Figure A.10 – Example of radiated interference	34
Figure A.11 – Sensitive zone of wheel detectors	35
Figure B.1 – Example of a system for the measurement of interference currents.....	37
Figure D.1 – Rolling stock with DC supply.....	41
Figure D.2 – Circulation of interference current generated by rolling stock.....	41
Figure D.3 – Circulation of interference current generated by the substation.....	41
Figure E.1 – Rolling stock and AC supply without power converter	43
Figure E.2 – Rolling stock and AC supply with power converter	43
Figure E.3 – Circulation of interference current generated by rolling stock	43
Figure E.4 – Circulation of interference current generated by the substation	44

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RAILWAY APPLICATIONS –
COMPATIBILITY BETWEEN ROLLING STOCK
AND TRAIN DETECTION SYSTEMS**

FOREWORD

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International Standard IEC 62427 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

It was submitted to the National Committees for voting under the Fast Track Procedure as the following documents:

FDIS	Report on voting
9/1058/FDIS	9/1088/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 document is based on EN 50238.

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

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 Standard defines a process to obtain the assurance that specific rolling stock operating on a specific route does not interfere with train detection systems installed on this route.

Compatibility problems between train detection systems and rolling stock are a significant obstacle to cross-acceptance of rolling stock in Europe. Unfortunately it is not possible to establish general rules for the maximum levels of interference allowed valid for every country. This is due to the great diversity of rolling stock, power supply and return current systems, and train detection systems installed in Europe. This diversity leads to consideration of the problem of compatibility of rolling stock and train detection systems for specific routes to avoid unnecessarily restrictive specifications.

Compatibility is determined by both physical and electromagnetic considerations. With regard to EMC, the need is not for general values for maximum levels of interference permitted, but for convenient methods by which to specify the level of interference allowed for operation on specific routes.

Interference may be caused by

- rail currents,
- electromagnetic fields,
- differential voltage between axles,

as shown in Figure 1.

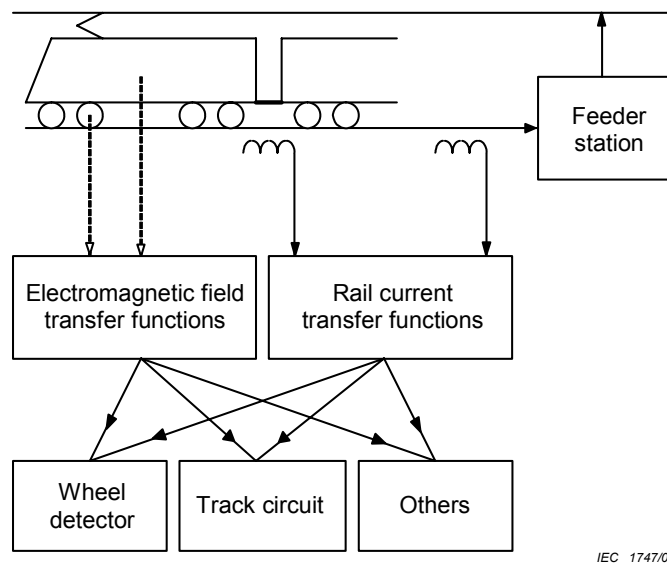


Figure 1 – Sources of electromagnetic interference

In practice, the susceptibility of the system is determined by

- the sensitivity of individual components of the system,
- the application of the components, i.e. the configuration of the system.

Therefore the problems concerning track circuits and axle counters or wheel detection systems will be considered separately.

For determining the susceptibility of train detection systems, laboratory/simulation testing methods as well as methods to conduct tests on the “real railway” are proposed. Modelling enables worst-case conditions to be simulated. In addition, particular test sites are used because, from experience, they are known to provide the test evidence required. Then, taking account of the experience of the railways, it is possible to establish a general method for determining the susceptibility of train detection systems, described in this Standard.

Before measuring the interference level on rolling stock, a sufficient knowledge of the electric circuit diagram of the power equipment is required, e.g. switching frequencies of on-board static converters, type of regulation used for power converters, resonant frequency of each filter, operating limits under high and low supply voltages, downgraded modes of operation, etc.