

Nederlandse norm

NEN-EN 50121-3-1

(en)

Spoorwegen en soortgelijk geleid vervoer -
Elektromagnetische compatibiliteit - Deel 3-1:
Rollend materieel - Treinen en complete
voertuigen

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

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Voorbeeld
 Preview

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Nederlands voorwoord

Voor de in deze norm vermelde normatieve verwijzingen bestaan in Nederland de volgende equivalenten:

<u>vermelde norm</u>	<u>Nederlandse norm</u>	<u>titel</u>
EN 50121-1	NEN-EN 50121-1	Spoorwegen en soortgelijk geleid vervoer - Elektromagnetische compatibiliteit - Deel 1: Algemeen (en)
EN 50121-2	NEN-EN 50121-2	Spoorwegtoepassingen - Elektromagnetische compatibiliteit - Deel 2: Emissie van het gehele railsysteem naar buiten (en)
EN 50121-3-2	NEN-EN 50121-3-2	Spoorwegen en soortgelijk geleid vervoer - Elektromagnetische compatibiliteit - Deel 3-2: Rollend materieel - Apparatuur (en)
EN 50238	NEN-EN 50238	Railtoepassingen - Compatibiliteit tussen rollend materieel en trein detectiesystemen (en)
EN 55016-1-1	NEN-EN 55016-1-1	Specificatie voor meetapparatuur en meetmethoden voor radiostoringen en immuniteit - Deel 1-1: Meetapparatuur voor radiostoringen en immuniteit - Meetapparatuur (en)

Copyright
Preview

English version

**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

Bahnanwendungen -
Elektromagnetische Verträglichkeit
Teil 3-1: Bahnfahrzeuge -
Zug und gesamtes Fahrzeug

This European Standard was approved by CENELEC on 2006-07-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This European Standard was prepared by Technical Committee TC 9X: Electrical and electronic applications for railways. The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50121-3-1 on 2006-07-01.

This European Standard supersedes EN 50121-3-1:2000.

This European Standard is to be read in conjunction with EN 50121-1.

This standard forms Part 3-1 of the European Standard series EN 50121, published under the general title "Railway applications - Electromagnetic compatibility". The series consists of:

- Part 1 : General
- Part 2 : Emission of the whole railway system to the outside world
- Part 3-1 : Rolling stock - Train and complete vehicle
- Part 3-2 : Rolling stock - Apparatus
- Part 4 : Emission and immunity of the signalling and telecommunications apparatus
- Part 5 : Emission and immunity of fixed power supply installations and apparatus

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2007-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2009-07-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 89/336/EEC. See Annex ZZ.

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

1 Scope

This European Standard 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 part of the 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 shall 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 shall 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 EN 50121-2.

These specific provisions are to be used in conjunction with the general provisions in EN 50121-1.

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.

EN 50121-1	Railway applications - Electromagnetic compatibility Part 1: General
EN 50121-2	Railway applications - Electromagnetic compatibility Part 2: Emission of the whole railway system to the outside world
EN 50121-3-2	Railway applications - Electromagnetic compatibility Part 3-2: Rolling stock - Apparatus
EN 50238	Railway applications - Compatibility between rolling stock and train detection systems
EN 55016-1-1	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus (CISPR 16-1-1)
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 Definitions

For the purpose of this Part 3-1 of the European Standard, the following 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

hailed 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.

6 Emission tests and limits

The emission tests and limits for rolling stock in this standard should ensure as far as possible that the rolling stock does not interfere with typical installations in the vicinity of the railway system.

Measurements shall be performed in well-defined and reproducible conditions. It is not possible to totally separate the effects of the railway system and the stock under test. Therefore, the operator and the manufacturer have to define in the contract the test conditions and the test site for compatibility with signalling and communication systems and for interference on telecommunication lines, (e.g. load conditions, speed and configuration of the units). For radiated emissions, the test conditions are defined in 6.3.1 and 6.3.2. The contributions of other parts of the railway system (e.g. substations, signalling) and of the external environment (e.g. power lines, industrial sites, radio and television transmitters) to the measurements must be known and taken into account.

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