500 CUMPN

Raudteealased rakendused. Elektromagnetiline ühilduvus. Osa 2: Raudteesüsteemide poolt keskkonda eraldatav kiirgus

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



EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 50121- 2:2006 sisaldab Euroopa standardi EN 50121-2:2006 ingliskeelset teksti.	This Estonian standard EVS-EN 50121- 2:2006 consists of the English text of the European standard EN 50121-2:2006.
Käesolev dokument on jõustatud 22.09.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.	This document is endorsed on 22.09.2006 with the notification being published in the official publication of the Estonian national standardisation organisation.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.
· · · · · · · · · · · · · · · · · · ·	

Käsitlusala: This European Standard sets the emission limits from the whole railway system including urban vehicles for use in city streets. It describes the measurement method to verify the emissions, and gives the cartography values of the fields most frequently encountered.	Scope: This European Standard sets the emission limits from the whole railway system including urban vehicles for use in city streets. It describes the measurement method to verify the emissions, and gives the cartography values of the fields most frequently encountered.

ICS 29.020, 29.280, 45.020

Võtmesõnad: el, electronic eng, emc, emissions, environment, interfering emissions, limits (mathematics), mathematics, measuring techniques, radio disturbances, radio interferences, rail transport, railway applications, railway engineering, railway fixed equipment, railways

EUROPEAN STANDARD

EN 50121-2

NORME EUROPÉENNE EUROPÄISCHE NORM

July 2006

ICS 29.020; 29.280; 45.020

Supersedes EN 50121-2:2000

English version

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

Applications ferroviaires -Compatibilité électromagnétique Partie 2: Emission du système ferroviaire dans son ensemble vers le monde extérieur Bahnanwendungen -Elektromagnetische Verträglichkeit Teil 2: Störaussendungen des gesamten Bahnsystems in die Außenwelt

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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

© 2006 CENELEC - All rights of exploitation in any form and by any means reserved worldwide for CENELEC members.

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 50121-2 on 2006-07-01.

This European Standard supersedes EN 50121-2:2000.

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

This standard forms Part 2 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.

Contents

1	1 Scope		
2 Normative references			4
3	Defin	itions	5
4	Emis	sion limits	5
	4.1	Emission from the open railway route during train operation	5
	4.2	Radio frequency emission from railway substations	5
5	Meth	od of measurement of emission from moving trains	6
	5.1	Measurement parameters	6
	5.2	Frequency selection	8
	5.3	Transients	8
	5.4	Measuring conditions	8
	5.5	Test report	9
	5.6	Antenna positions	9
		で	
Anne	x A (no	ormative) Method of measurement of electromagnetic emission from railway substations1	5
Anne	x B (in	formative) Background to the method of measurement1	6
Anne	x C (in	formative) Cartography - Electric and Magnetic fields at traction frequencies2	1
Anne	x ZZ (i	nformative) Coverage of Essential Requirements of EC Directives	2
-		mission limits in frequency range 9 kHz to 1 GHz1	
Figur	e 2 - E	mission limit for substations1	1
Figure 3 - Position of antenna for measurement of magnetic field in the 9 kHz to 30 MHz frequency band			2
Figure 4 - Position (vertical polarisation) of antenna for measurement of electric field in the 30 MHz to 300 MHz frequency band			3
Figure 5 - Position (vertical polarisation) of antenna for measurement of electric field in the 300 MHz to 1 GHz frequency band			4
Figur	e B.1 -	Time variation of emissions from a moving train with many transient events	0
Table		Typical maximum electric and magnetic field values at fundamental frequency of different electrification systems	1
		at fundamental frequency of different electrification systems	

1 Scope

This European Standard sets the emission limits from the whole railway system including urban vehicles for use in city streets. It describes the measurement method to verify the emissions, and gives the cartography values of the fields most frequently encountered.

The limits refer to the particular measuring points defined in Clause 5 and Annex A. These emissions should be 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 may be affected by electromagnetic emissions and particular cases shall be considered individually.

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

This part of the standard covers EMC for fixed installations and therefore is not relevant for CE marking.

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 50121-3-1	Railway applications - Electromagnetic compatibility Part 3-1: Rolling stock - Train and complete vehicle
EN 50121-5	Railway applications - Electromagnetic compatibility Part 5: Emission and immunity of fixed power supply installations and apparatus
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)
EN 55022	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement (CISPR 22, mod.)
EN 61000-6-4	Electromagnetic Compatibility (EMC) Part 6-4: Generic Standards - Emission standard for industrial environments (IEC 61000-6-4, mod.)
CISPR 18	Radio interference characteristics of overhead power lines and high voltage equipment
IEC 60050	International Electrotechnical Vocabulary (IEV)