

Svenska Elektriska Kommissionen, SEK

Fastställt	Utgåva	Sida	Ingår i
2007-02-26	2	1 (1+22)	SEK Område 9

© Copyright SEK. Reproduction in any form without permission is prohibited.

Järnvägsanläggningar – Elektromagnetisk kompatibilitet (EMC) – Del 2: Emission från hela järnvägssystemet till omgivningen

Railway applications –

Electromagnetic compatibility –

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

Som svensk standard gäller europastandarden EN 50121-2:2006. Den svenska standarden innehåller den officiella engelska språkversionen av EN 50121-2:2006.

Nationellt förord

Standarden skall användas tillsammans med SS-EN 50121-1.

Tidigare fastställd svensk standard SS-EN 50121-2, utgåva 1, 2000, gäller ej fr o m 2009-07-01.

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

Svenska Elektriska Kommissionen, SEK, svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK

Box 1284
164 29 Kista
Tel 08-444 14 00
www.sekom.se

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

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	Scope	4
2	Normative references.....	4
3	Definitions	5
4	Emission limits.....	5
4.1	Emission from the open railway route during train operation	5
4.2	Radio frequency emission from railway substations.....	5
5	Method 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
	Annex A (normative) Method of measurement of electromagnetic emission from railway substations	15
	Annex B (informative) Background to the method of measurement	16
	Annex C (informative) Cartography - Electric and Magnetic fields at traction frequencies	21
	Annex ZZ (informative) Coverage of Essential Requirements of EC Directives	22
	Figure 1 - Emission limits in frequency range 9 kHz to 1 GHz	10
	Figure 2 - Emission limit for substations.....	11
	Figure 3 - Position of antenna for measurement of magnetic field in the 9 kHz to 30 MHz frequency band.....	12
	Figure 4 - Position (vertical polarisation) of antenna for measurement of electric field in the 30 MHz to 300 MHz frequency band.....	13
	Figure 5 - Position (vertical polarisation) of antenna for measurement of electric field in the 300 MHz to 1 GHz frequency band	14
	Figure B.1 - Time variation of emissions from a moving train with many transient events	20
	Table C.1 - Typical maximum electric and magnetic field values at fundamental frequency of different electrification systems	21

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)