

**Overhead electrical lines exceeding AC 1 kV - Part -2-7:
National Normative Aspects (NNA) for FINLAND (based
on EN 50341-1:2012)**

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 50341-2-7:2016 sisaldab Euroopa standardi EN 50341-2-7:2015 ingliskeelset teksti.	This Estonian standard EVS-EN 50341-2-7:2016 consists of the English text of the European standard EN 50341-2-7:2015.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
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Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

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Part -2-7: National Normative Aspects (NNA) for FINLAND
(based on EN 50341-1:2012)**

This European Standard was approved by CENELEC on 2015-08-11.

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



European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

- 1 The Finnish National Committee (NC) is identified by the following address:

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- 2 The Finnish NC has prepared this Part 2-7 of EN 50341 listing the Finnish national normative aspects (NNA), under its sole responsibility, and duly passed it through the CENELEC and CLC/TC 11 procedures.

NOTE: The Finnish NC also takes sole responsibility for the technically correct co-ordination of this NNA with EN 50341-1. It has performed the necessary checks in the frame of quality assurance/control. However, it is noted that this quality control has been made in the framework of the general responsibility of a standards committee under the national laws/regulations.

- 3 This NNA is normative in Finland and informative for other countries.

- 4 This NNA has to be read in conjunction with Part 1 (EN 50341-1). All clause numbers used in this NNA correspond to those of Part 1. Specific sub-clauses, which are prefixed "FI", are to be read as amendments to the relevant text in Part 1. Any necessary clarification regarding the application of this combined NNA in conjunction with Part 1 shall be referred to the Finnish NC who will, in co-operation with CLC/TC 11, clarify the requirements.

When no reference is made in this NNA to a specific sub-clause, then Part 1 applies.

- 5 In the case of "boxed values" defined in Part 1, amended values (if any), which are defined in this NNA, shall be taken into account in Finland.

However, any boxed value, whether in Part 1 or in this NNA, shall not be amended in the direction of greater risk in a Project Specification.

- 6 The national Finnish standards/regulations related to overhead electrical lines exceeding 1 kV AC are listed in 2.1/FI.1-2.

NOTE: All national standards referred to in this NNA will be replaced by the relevant European Standards as soon as they become available and are declared by the Finnish NC to be applicable and thus reported to the secretary of CLC/TC 11.

1 Scope

1.1 General

(ncpt) FI.1 Application of the standard in Finland

In Finland the standard EN 50341-1 (Part 1) can only be applied using this NNA (EN 50341-2-7) containing National Normative Aspects for Finland.

The requirements of the standard are applied also for low voltage (below 1 kV AC) overhead lines. The requirements of the structural design are applicable also for DC overhead lines, where the electrical requirements are given in the Project Specification.

This standard is applicable for new overhead lines only.

(ncpt) FI.2 Application for existing overhead lines

Overhead lines complying with the mechanical and electrical requirements of its original date of construction can be operated and maintained, if they do not cause obvious danger.

The reparation and overhaul of lines can be done according to the previous requirements. Reparation means that a component which has been damaged is substituted with a similar new one. Overhaul means a wider improvement of the line for extending its lifetime. The basic structure remains same as before.

This standard should be used for all modification works on existing lines. In modification works earlier norms and standards may also be used. In that case it shall especially be verified that changes in actions do not have significant impact on the loads of lines. Modification work means e.g. relocation of some supports or an extension to a line when this supplement has been taken into account in the original design, e.g. addition of a circuit or changing of the conductors to existing supports.

1.2 Field of application

(ncpt) FI.1 Application to covered conductors and aerial cables

The standard includes requirements for the design and construction of overhead lines equipped with covered conductors and aerial cables. Additionally, the requirements of the equipment standards and manufacturers' instructions shall be followed.

(ncpt) FI.2 Application to cables for telecommunication

The standard includes requirements for the application of telecommunication cables installed on common supports with electrical lines.

(ncpt) FI.3 Installation of other equipment

Only equipment belonging to the line (electric or telecommunication line) can be installed on the overhead lines. However, equipment serving communal services or environmental protection like telecommunication equipment, road signs, warning signs or warning balls may also be installed with the permission of the owner of the line.

Other equipment than those mentioned above can also be installed on supports equipped with aerial cables with the permission of the owner of the line.

If other equipment is installed on the supports, the requirements of safe working practices shall be taken into account. The installation height of equipment meant to be installed and maintained by an ordinary person shall be such that the work can be done without climbing the support and the distances of safe electrical work can be followed (see standard SFS 6002).

The additional loads due to other equipment on the line supports shall be taken into account.

2 Normative references, definitions and symbols

2.1 Normative references

(A-dev) FI.1 National normative laws, government regulations

Sähköturvallisuuslaki (410/1996)

Electrical Safety Act

Sähköturvallisuusasetus (498/1996)

Electrical Safety Decree

Kauppa- ja teollisuusministeriön päätös sähkölaitteistojen turvallisuudesta (1193/1999)

Decision of Ministry of Trade and Industry on Safety of electrical installations

Viestintäviraston määräys M 43 tietoliikenneverkon sähköisestä suojaamisesta

Decree nr M 43 of the Finnish Communications Regulatory Authority on the electrical protection of a telecommunication network

Liikenteen turvallisuusviraston määräys AGA M3-6, Lentoesterajoitukset ja lentoesteiden merkitseminen. *Aviation regulation AGA M3-6 of the Finnish Transport Safety Agency on the Aviation obstacle limitations and marking of objects.*

Liikenneviraston ohje 23/2014 Ilmajohtojen sekä kaapeleiden ja putkijohtojen asettaminen ja merkitseminen vesialueella. *Publication 23/2014 of the Finnish Transport Agency: Installation and marking of overhead lines, cables and pipelines in waterways.*

(ncpt)

FI.2 National normative standards

- SFS 2662 Ilmajohtotarvikkeet. Puupylväs
Overhead line materials. Wood pole
- SFS 5717 Maakaasun siirtoputkiston sijoittaminen suurjännitejohdon tai kytkinlaitoksen läheisyyteen
Placing of the natural gas transmission pipeline close to a high-voltage line or substation
- SFS 6000 Pienjännitesähköasennukset
Low voltage electrical installations
- SFS 6001 Suurjännitesähköasennukset
High voltage electrical installations
- SFS 6002 Sähkötöturvallisuus (perustuu standardiin EN 50110-1/2)
Safety at electrical work (based on standard EN 50110-1/2)
- RIL 202/by 61 Betonirakenteiden suunnitteluohje (perustuu standardiin SFS-EN 1992-1-1)
Design guide for concrete structures (based on standard SFS-EN 1992-1-1)
- RIL 207 Geotekninen suunnittelu (perustuu standardiin SFS-EN 1997-1)
Geotechnical design (based on standard SFS-EN 1997-1)
- RIL 254 Paalutusohje
Piling instructions

3 Basis of design

3.2 Requirements of overhead lines

3.2.2 Reliability requirements

(ncpt)

FI.1 Selection of reliability levels

The minimum reliability levels based on the nominal voltage and importance of the lines are defined in Table 3.1/FI.1 below. The level shall be given in the Project Specification.

Table 3.1/FI.1 - Reliability levels of overhead lines in Finland

Level	Nominal voltage	Type of line
1	$U_n \leq AC\ 45\ kV$	Normal lines
	$U_n > AC\ 45\ kV$	Temporary or unimportant lines
2	$U_n \leq AC\ 45\ kV$	Special lines
	$U_n > AC\ 45\ kV$	Normal lines
3	all	Very important lines, i.e. all 400 kV lines

3.2.5 Strength coordination

(ncpt)

FI.1 Angle and tension supports

The partial factors γ_M for the resistance of the structural elements of angle (angle ≥ 10 degrees), tension and terminal supports shall be multiplied by an additional factor $\gamma_S = 1,1$. This requirement needs not to be applied at construction load cases.

In these cases, when determining the structural design resistance R_d in the basic design formula $E_d \leq R_d$, the design value X_d of a material property shall be calculated from formula:

$$X_d = X_K / (\gamma_M \gamma_S) \quad \text{See Clauses 3.6.3 and 3.7.2 of Part 1.}$$

This clause shall be applied only for lines with nominal voltages $> 45\ kV$, if not otherwise required in the Project Specification.