

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 50341-2-7:2023 sisaldab Euroopa standardi EN 50341-2-7:2023 ingliskeelset teksti. Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 29.09.2023. Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	This Estonian standard EVS-EN 50341-2-7:2023 consists of the English text of the European standard EN 50341-2-7:2023. This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation. Date of Availability of the European standard is 29.09.2023. The standard is available from the Estonian Centre for Standardisation and Accreditation.
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EUROPEAN STANDARD

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

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

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

SESKO Electrotechnical Standardization in Finland
Standardization committee SK 11, High Voltage Overhead Lines
Addr. Takomotie 8, 00380 Helsinki, Finland
Tel. +358 50 571 6048
Email asiakaspalvelu@sesko.fi

- 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 the modification works, earlier norms and standards may also be used, if allowed by the valid Electrical Safety Act. In that case it shall especially be verified that changes in actions do not cause significant increase in the loads of the line. Modification work means e.g. relocation of some supports or an extension to a line by 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 considered.

(ncpt) **FI.2 Installation of other equipment**

Only equipment belonging to the line (electric or telecommunication line) can be installed on the overhead line supports. 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.

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

If other equipment is installed on the supports, the requirements of safe working practices shall be considered. 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 to the line shall be considered.

2 Normative references, definitions and symbols

2.1 Normative references

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

Sähköturvallisuuslaki (1135/2016)

Electrical Safety Act

Valtioneuvoston asetus sähkölaitteistoista (1434/2016)

Governmental Degree on electrical installations

Traficomın määräys M 43 tietoliikenneverkon sähköisestä suojaamisesta

Decree nr M 43 of Traficom on the electrical protection of a telecommunication network

Traficomın määräys AGA M3-6, Lentoesterajoitukset ja lentoesteiden merkitseminen. *Aviation regulation AGA M3-6 of Traficom on the Aviation obstacle limitations and marking of objects.*

Traficomın ohje 23/2014 Ilmajohtojen sekä kaapeleiden ja putkijohtojen asettaminen ja merkitseminen vesialueella.

Publication 23/2014 of Traficom: 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 Sähkötyöturvallisuus (perustuu standardiin EN 50110-1/2)
Safety at electrical work (based on standard EN 50110-1/2)

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	$U_n \leq \text{AC } 45 \text{ kV}$	Normal lines
	$U_n > \text{AC } 45 \text{ kV}$	Temporary or unimportant lines
2	$U_n \leq \text{AC } 45 \text{ kV}$	Special lines
	$U_n > \text{AC } 45 \text{ kV}$	Normal lines
3	all	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 (line 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 $> 45 \text{ kV}$, if not otherwise required in the Project Specification.

(ncpt)

FI.2 Foundations

As the foundation should resist 10 % higher loads than the support, the loads from the support to foundations shall be multiplied by the factor 1,1. See also Clause 8.1/FI.3.

At angle, tension and terminal supports of lines with nominal voltage $> 45 \text{ kV}$ the loads shall be multiplied by an additional factor 1,1. Thus, in these cases the total factor will be 1,21. This requirement needs not to be applied at construction load cases.

Alternatively, the strength coordination of the foundations can be executed by applying the factors 1,1 and 1,21 to the partial factors of the resistances and properties of materials.