

STN	Vonkajšie elektrické vedenia so striedavým napätím nad 1 kV Časť 2-7: Národné normatívne hľadiská (NNA) pre FÍNSKO (založené na EN 50341-1: 2012)	STN EN 50341-2-7 33 3300
------------	--	--

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

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 11/23

Obsahuje: EN 50341-2-7:2023

Oznámením tejto normy sa ruší
STN EN 50341-2-7 (33 3300) z marca 2016

137715

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2023
Slovenská technická norma a technická normalizačná informácia je chránená zákonom č. 60/2018 Z. z. o technickej normalizácii v znení neskorších predpisov.

EUROPEAN STANDARD

EN 50341-2-7

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2023

ICS 29.240.20

Supersedes EN 50341-2-7:2015

English Version

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

This European Standard was approved by CENELEC on 2023-08-30.

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



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

Contents	Page
European foreword	4
1 Scope	5
1.1 General.....	5
1.2 Field of application	5
2 Normative references, definitions and symbols	5
2.1 Normative references	5
3 Basis of design	6
3.2 Requirements of overhead lines	6
3.2.2 Reliability requirements	6
3.2.5 Strength coordination	6
4 Actions on lines	7
4.3 Wind loads.....	7
4.3.1 Field of application and basic wind velocity.....	7
4.3.2 Mean wind velocity	7
4.3.3 Mean wind pressure	7
4.4 Wind forces on overhead line components	7
4.4.1 Wind forces on conductors	7
4.4.1.1 General.....	7
4.4.1.2 Structural factor	8
4.4.1.3 Drag factor.....	8
4.4.2 Wind forces on insulator sets	8
4.4.3 Wind forces on lattice towers.....	8
4.4.3.1 General.....	8
4.4.4 Wind forces on poles	9
4.5 Ice loads.....	9
4.5.1 General.....	9
4.6 Combined wind and ice loads	10
4.6.2 Drag factors and ice densities.....	10
4.7 Temperature effects	10
4.8 Security loads	10
4.9 Safety loads.....	10
4.9.1 Construction and maintenance loads	10
4.12 Load cases	11
4.12.1 General.....	11
4.12.2 Standard load cases	13
4.13 Partial factors for actions	14
5 Electrical requirements	16
5.5 Minimum air clearance distances to avoid flashover	16
5.5.1 General.....	16
5.6 Load cases for calculation of clearances	16
5.6.1 Load conditions	16
5.6.2 Maximum conductor temperature.....	17
5.6.3 Ice loads for determination of electric clearances	17
5.8 Internal clearances within the span and at the top of the support.....	17
5.9 External clearances	17
5.9.1 General.....	17
5.9.2 External clearances to ground in areas remote from buildings, roads etc. 17	17
5.9.3 External clearances to residential and other buildings	18
5.9.4 External clearances to crossing traffic routes	18
5.9.6 External clearances to other power lines or telecommunication lines.....	19
6 Earthing systems	21
6.1 Introduction	21

6.1.4	Transferred potentials	21
6.4	Dimensioning regarding human safety	21
6.4.3	Design of earthing systems regarding permissible touch voltage	21
7	Supports	22
7.3	Lattice steel towers	22
7.3.1	General.....	22
7.3.6	Ultimate limit states	22
7.3.6.1	General.....	22
7.3.6.4	General.....	22
7.3.9	Design assisted by testing	22
7.5	Wood poles.....	23
7.5.3	Materials	23
7.5.5	Ultimate limit states	23
7.5.5.1	Basis	23
7.5.5.2	Calculation of internal forces and moments.....	23
7.5.5.3	Resistance of wood elements	23
7.5.5.4	Decay conditions	23
7.7	Guyed structures	24
7.7.1	General.....	24
7.7.4	Ultimate limit states	24
7.7.4.1	Basis	24
7.7.4.3	Second order analysis	24
7.7.6	Design details for guys	25
7.10	Maintenance facilities.....	25
7.10.3	Safety requirements	25
8	Foundations.....	27
8.1	Introduction	27
8.2	Basis of geotechnical design	28
8.2.1	General.....	28
8.2.2	Geotechnical design by calculation.....	28
8.2.3	Design by prescriptive measures	29
9	Conductors and earth wires	30
9.1	Introduction	30
9.6	General requirements.....	30
9.6.2	Partial factor for conductors	30
10	Insulators.....	30
10.2	Standard electrical requirements.....	30
10.11	Type test requirements	31
11	Hardware.....	31
11.6	Mechanical requirements.....	31
11.8	Material selection and specification	31
12	Quality assurance, checks and taking-over	31
Annex J	32	
J.4	Buckling resistance of angles in compression	32
J.4.3	Slenderness of members	32
J.4.3.1	General.....	32
J.4.4	Secondary bracing members	32

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 Ilmajohdojen 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 Ilmajohdotarvikkeet. 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 Sähköturvallisuus (perustuu standardiin EN 50110-1/2)
Safety at electrical work (based on standard EN 50110-1/2)

koniec náhľadu – text ďalej pokračuje v platenej verzii STN