



**SLOVENSKI STANDARD**  
**SIST EN 50214:2024**

**01-september-2024**

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**Ploščati zvijavi kabli**

Flat flexible cables

Flache flexible Leitung

Câbles souples méplats

**Ta slovenski standard je istoveten z: EN 50214:2024**

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**en**



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English Version

## Flat flexible cables

Câbles souples méplats

Flache flexible Leitung

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**EN 50214:2024 (E)**

<b>Contents</b>	<b>Page</b>
European foreword .....	4
1 Scope .....	5
2 Normative references .....	5
3 Definitions .....	7
3.1 Definitions relating to insulating and sheathing materials .....	7
3.2 Definitions relating to the tests .....	7
4 Requirements for the construction of cables .....	8
4.1 General .....	8
4.2 Power and control cores .....	9
4.3 Communication units .....	9
5 Flat sheathed flexible cables for lifts, assembled in single layer .....	9
5.1 Code designation .....	9
5.2 Rated voltage of power and control cores .....	10
5.3 Construction .....	10
5.3.1 Conductor of power and control cores .....	10
5.3.2 Insulation .....	10
5.3.3 Assembly of cores and communication units .....	10
5.3.4 Strain bearing member (sbm) .....	11
5.3.5 Sheath .....	11
5.4 Tests .....	12
6 Flat sheathed flexible cables for lifts, assembled in bundles and units .....	13
6.1 Code designation .....	13
6.2 Rated voltage of power and control cores .....	13
6.3 Construction .....	13
6.3.1 Conductor of power and control cores .....	13
6.3.2 Insulation .....	13
6.3.3 Assembly of bundles and units .....	13
6.3.4 Strain bearing member (sbm) .....	13
6.3.5 Sheath .....	14
6.4 Tests .....	14
7 Flat PVC sheathed flexible cable of rated voltage 450/750 V .....	17
7.1 Code designation .....	17
7.2 Rated voltage .....	17
7.3 Construction .....	17
7.3.1 General .....	17
7.3.2 Conductor .....	18
7.3.3 Insulation .....	18
7.3.4 Assembly of cores .....	18
7.3.5 Strain bearing member (sbm) .....	18
7.3.6 Sheath .....	19
7.4 Tests .....	19
8 Test methods .....	21
9 Marking .....	21
9.1 General .....	21

9.2 Common marking .....	21
10 Guide to use .....	21
Annex A (normative) Test methods .....	22
Annex B (normative) Guide to use .....	27
Annex ZZ (informative) Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered .....	29
Bibliography.....	31

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**EN 50214:2024 (E)****European foreword**

This document (EN 50214:2024) has been prepared by CLC/TC 20 "Electric cables".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2025-05-27
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2027-05-27

This document supersedes EN 50214:2006 and all of its amendments and corrigenda (if any).

EN 50214:2024 includes the following significant technical changes with respect to EN 50214:2006:

- Halogen-free insulated and sheathed flat cables are included.
- The cable may consist of power cores, control cores or communication units or combination of them.
- Clause 5 describes only flat sheathed flexible cables for lifts, assembled in single layer.
- Clause 6 describes only flat sheathed flexible cables for lifts, assembled in bundles and units

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a standardization request addressed to CENELEC by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZZ, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

## 1 Scope

This document covers the construction, requirements and particular test methods for flat, flexible PVC or halogen-free insulated and sheathed cables, of rated voltage  $U_o/U$  300/500 V and above 1 mm<sup>2</sup>,  $U_o/U$  450/750 V for use in passenger and goods lifts (elevators), and  $U_o/U$  450/750 V for general purposes and for special applications such as hoists and travelling cranes.

NOTE 1 This revision is in accordance with an agreement with CEN TC 10 to specify in the same standard a) flexible cables for lifts as required by EN 81 series, and b) flexible cable for applications such as hoists and travelling cranes, previously found in HD 359. In accordance with this agreement, only those cables in Clauses 5 and 6 are suitable for use with EN 81 series.

NOTE 2 The limits for the overall diameter of the cables have been calculated in accordance with EN 60719.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 50334:2001, *Marking by inscription for the identification of cores of electric cables*

EN 50363-3:2005,<sup>1</sup> *Insulating, sheathing and covering materials for low voltage energy cables - Part 3: PVC insulating compounds*

EN 50363-4-1:2005, *Insulating, sheathing and covering materials for low voltage energy cables - Part 4-1: PVC sheathing compounds*

EN 50363-5:2005,<sup>2</sup> *Insulating, sheathing and covering materials for low voltage energy cables - Part 5: Halogen-free, cross-linked insulating compounds*

EN 50363-7:2005, *Insulating, sheathing and covering materials for low voltage energy cables - Part 7: Halogen-free, thermoplastic insulating compounds*

EN 50363-8:2005,<sup>3</sup> *Insulating, sheathing and covering materials for low voltage energy cables - Part 8: Halogen-free, thermoplastic sheathing compounds*

EN 50395:2005,<sup>4</sup> *Electrical test methods for low voltage energy cables*

EN 50396:2005,<sup>5</sup> *Non electrical test methods for low voltage energy cables*

EN 50525-1:2011,<sup>6</sup> *Electric cables - Low voltage energy cables of rated voltages up to and including 450/750 V (U<sub>0</sub>/U) - Part 1: General requirements*

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<sup>1</sup> As impacted by EN 50363-3:2005/A1:2011.

<sup>2</sup> As impacted by EN 50363-5:2005/A1:2011.

<sup>3</sup> As impacted by EN 50363-8:2005/A1:2011.

<sup>4</sup> As impacted by EN 50395:2005/A1:2011.

<sup>5</sup> As impacted by EN 50396:2005/A1:2011.

<sup>6</sup> As impacted by EN 50525-1:2011/A1:2022.

**EN 50214:2024 (E)**

EN 50565-1:2014, *Electric cables - Guide to use for cables with a rated voltage not exceeding 450/750 V (U0/U) - Part 1: General guidance*

EN 60228:2005,<sup>7</sup> *Conductors of insulated cables*

EN 60332-1-2:2004,<sup>8</sup> *Tests on electric and optical fibre cables under fire conditions - Part 1-2: Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame*

EN IEC 60332-3-24:2018, *Tests on electric and optical fibre cables under fire conditions - Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables - Category C*

EN IEC 60754-3:2019, *Test on gases evolved during combustion of materials from cables - Part 3: Measurement of low level of halogen content by ion chromatography*

EN 60811-409:2012, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 409: Miscellaneous tests - Loss of mass test for thermoplastic insulations and sheaths*

EN 60811-501:2012,<sup>9</sup> *Electric and optical fibre cables - Test methods for non-metallic materials - Part 501: Mechanical tests - Tests for determining the mechanical properties of insulating and sheathing compounds*

EN 60811-502:2012, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 502: Mechanical tests - Shrinkage test for insulations*

EN 60811-504:2012, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 504: Mechanical tests - Bending tests at low temperature for insulation and sheaths*

EN 60811-505:2012, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 505: Mechanical tests - Elongation at low temperature for insulations and sheaths*

EN 60811-506:2012, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 506: Mechanical tests - Impact test at low temperature for insulations and sheaths*

EN 60811-507:2012, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 507: Mechanical tests - Hot set test for cross-linked materials*<sup>24</sup>

EN 60811-509:2012, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 509: Mechanical tests - Test for resistance of insulations and sheaths to cracking (heat shock test)*

EN 61034-2:2005,<sup>10</sup> *Measurement of smoke density of cables burning under defined conditions - Part 2: Test procedure and requirements*

HD 308 S2:2001, *Identification of cores in cables and flexible cords*

HD 60364-5-52:2011,<sup>11</sup> *Low-voltage electrical installations — Part 5-52. Selection and erection of electrical equipment — Wiring systems (IEC 60364-5-52:2009, modified)*

<sup>7</sup> As impacted by EN 60228:2005/corrigendum May 2005.

<sup>8</sup> As impacted by EN 60332-1-2:2004/A1:2015, EN 60332-1-2:2004/A11:2016 and EN 60332-1-2:2004/A12:2020.

<sup>9</sup> As impacted by EN 60811-501:2012/A1:2018.

<sup>10</sup> As impacted by EN 61034-2:2005/A1:2013 and EN 61034-2:2005/A2:2020.

<sup>11</sup> As impacted by HD 60364-5-52:2011/A11:2017.



IEC 60227-6:2001, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V — Part 6: Lift cables and cables for flexible connections*

IEC 61156-6:2020, *Multicore and symmetrical pair/quad cables for digital communications — Part 6: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz — Work area wiring — Sectional specification*

ISO 11898-1:2015, *Road vehicles — Controller area network (CAN) — Part 1: Data link layer and physical signalling*

### 3 Definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

#### 3.1 Definitions relating to insulating and sheathing materials

##### 3.1.1

##### **type of compound**

category in which a compound is placed according to its properties and determined by specific tests

Note 1 to entry: The type designation is not directly related to the composition of the compound.

##### 3.1.2

##### **polyvinyl chloride compound**

##### **PVC**

combinations of materials, of which polyvinyl chloride is the characteristic constituent, suitably selected, proportioned and treated which meet the requirements given in the particular specification

##### 3.1.3

##### **halogen-free compound**

##### **halogen-free**

halogen-free thermoplastic material with improved properties in reaction of fire

#### 3.2 Definitions relating to the tests

##### 3.2.1

##### **type test**

##### **T**

test required to be made before supplying a type of cable covered by this document on a general commercial basis, in order to demonstrate satisfactory performance characteristics to meet the intended application

Note 1 to entry: These tests are of such a nature that, after they have been made, they need not be repeated unless changes are made in the cable materials, design or type of manufacturing process which might change the performance characteristics.

##### 3.2.2

##### **sample test**

##### **S**

test made on samples of completed cable, or components taken from a completed cable adequate to verify that the finished product meets the design specifications

**EN 50214:2024 (E)****3.2.3****routine test****R**

test made on all production cable lengths to demonstrate their integrity

**3.3****rated voltage**

<of a cable> reference voltage for which the cable is designed, and which serves to define the electrical tests

Note 1 to entry: The rated voltage is expressed by the combination of two values  $U_0/U$ , expressed in volts:

—  $U_0$  being the r.m.s. value between any insulated conductor and "earth" (metal covering of the cable or the surrounding medium);

—  $U$  being the r.m.s. value between any two phase-conductors of a multicore cable or of a system of single-core cables.

Note 2 to entry: In an alternating current system, the rated voltage of a cable shall be at least equal to the nominal voltage of the system for which it is intended.

Note 3 to entry: This condition applies both to the value  $U_0$  and to the value  $U$ .

Note 4 to entry: In a direct current system, the nominal voltage between conductors shall be not higher than 1,5 times the rated voltage ( $U$ ) of the cable, and the nominal voltage between any conductor and earth shall not be higher than 1,5 times the rated voltage ( $U_0$ ) of the cable.

Note 5 to entry: The operating voltage of a system may permanently exceed the nominal voltage of such a system by 10 %. A cable can be used at a 10 % higher operating voltage than its rated voltage if the latter is at least equal to the nominal voltage of the system.

**3.4****freely suspended length**

unsupported allowed length of cable between two fixing points

**3.5****strain bearing member****sbm**

metallic or non-metallic high tensile strand or bunch included in the cable construction in order to hold the cable weight

**3.6****rip cord**

element to simplify the detachability of the jacket, which meets the required tensile strength to allow a targeted tearing of the outer jacket.

Note 1 to entry: During the intended use of the cable, the element shall not cause any damage to the core insulation or the outer sheath.

**4 Requirements for the construction of cables****4.1 General**

The cable may consist of power cores, control cores or communication units or combination of them. Symmetric design is preferred.

## 4.2 Power and control cores

Unless otherwise indicated in Clauses 5, 6 or 7, the cables shall comply with the general requirements specified in EN 50525-1:2011,<sup>6</sup> Clause 5.

Core identification with or without a green-and-yellow core are harmonized. For cables with five cores or fewer, the identification of the remaining cores shall be either by colours, in accordance with a) below, or by numbers in accordance with b) below. For cables with six cores or more only identification by numbers shall be used, except for any green-and-yellow core.

### a) Identification by colours:

The identification system of HD 308 S2:2001 shall be used.

### b) Identification by numbers:

Identification by numbers shall be in accordance with EN 50334:2001.

The green-and-yellow core, if any, shall not be identified by a number.

## 4.3 Communication units

Communication units can be copper pairs, quads, coaxial cables or optical fibres or combinations of them. Cables can also consist exclusively of communication units.

Conductors shall have a minimum cross section of 0,14 mm<sup>2</sup>. Compounds may differ from the EN 50363 series.

Copper units (pairs, quads): (difference based on frequency OR characteristics):

- Units without defined High Frequency performances (below 100 MHz) shall be tested in accordance to the relevant product specification.
- Units with defined High Frequency performances (equal and above 100 MHz) of 100 Ohm impedance shall be tested with reference to IEC 61156-6:2020 and the relevant product specification.
- Units with defined High Frequency performances of 120 Ohm impedance shall be tested with reference to ISO 11898-1:2015 and the relevant product specification.

Coaxial cable units:

- Shall be tested with the relevant product specification.

Optical fibre units:

- Shall be tested with the relevant product specification.

## 5 Flat sheathed flexible cables for lifts, assembled in single layer

### 5.1 Code designation

PVC compound

Without strain bearing members:	H05VVH6-F / H05V3V3H6-F
With strain bearing members:	H05VVD3H6-F / H05V3V3D3H6-F

Halogen-free compound

Without strain bearing members:	H05Z1Z1H6-F / H05ZZ1H6-F
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