

**SLOVENSKI
STANDARD**

SIST EN 50214:1998

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februar 1998

Flexible cables for lifts

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Descriptors: Electric cable, flexible cable, insulated cable, lift, goods lift, definition, specification, construction, insulation, sheath, polyvinyl chloride, dimension, test, marking

English version

Flexible cables for lifts

Câbles souples pour ascenseurs
et monte-charge

Flexible Aufzugssteuerleitungen

This European Standard was approved by CENELEC on 1996-12-09. 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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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 the Technical Committee CENELEC TC 20, Electric cables.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50214 on 1996-12-09.

This European Standard supersedes, in respect of cables for use in goods and passenger lifts, HD 359 S2. The HD will be reviewed and revised in respect of its future applicability for other (non-lift) applications.

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) 1997-12-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 1997-12-01

For cables for use in goods and passenger lifts, which have complied with HD 359 S2:1990 before 1997-12-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1998-12-01.

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex A is normative and annex B is informative.

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CONTENTS

	Page
1. SCOPE	4
2. NORMATIVE REFERENCES	4
3. DEFINITIONS	4
4. GENERAL REQUIREMENTS FOR THE CONSTRUCTION OF CABLES	4
5. PARTICULAR REQUIREMENTS FOR THE CONSTRUCTION OF CABLES	5
6. TEST METHODS	13
7. MARKING	13
8. GUIDE TO USE	13
ANNEX A: TEST METHODS (Normative)	14
ANNEX B: GUIDE TO USE (Informative)	21

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[SIST EN 50214:1998](https://standards.iteh.ai/catalog/standards/sist/590145af-e1d8-4fbf-9c22-6c4656177ae4/sist-en-50214-1998)

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1. SCOPE

This European Standard covers the construction, requirements and particular test methods for flat, flexible PVC insulated and PVC sheathed cables, of rated voltage U_0/U 300/500 V, for use in passenger and goods lifts (elevators), as required by EN 81. Cables of composite construction (for instance, cables with cores of different sizes) are not specified, but conditions are given for the inclusion of telecommunication units into the cables.

2. NORMATIVE REFERENCES

This European Standard incorporates by dated or undated reference, provision from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 81:	Safety rules for the construction and installation of lifts and service lifts.
EN 60811:	Common test methods for insulating and sheathing materials of electric cables
HD 21:	PVC insulated cables of rated voltage up to 450/750 V
HD 186:	Marking by inscription for identification of cores of electric cables
HD 308:	Identification and use of cores of flexible cables
HD 383:	Conductors of insulated cables
HD 405.1:	Tests on electric cables under fire conditions : Part 1 - Single vertical cable
IEC 227-6:	Lift cables and cables for flexible connections

3. DEFINITIONS

3.1 General

General definitions specified in clause 2 of HD21.1 shall apply, as appropriate.

3.2 Freely suspended length

The unsupported allowed length of cable between two fixing points.

3.3 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.

4. GENERAL REQUIREMENTS FOR THE CONSTRUCTION OF CABLES

4.1 General

[SIST EN 50214:1998](#)

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Unless otherwise indicated in clause 5 of this EN, the cables shall comply with the general requirements specified in HD21.1, clause 5.

4.2 Core Identification

Both cables with or without a green/yellow core are harmonised. For cables with five cores or less, 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/yellow core.

(a) **Identification by colours**

The identification system of HD 308 shall be used.

(b) **Identification by numbers**

Identification by numbers shall be in accordance with HD 186 except that, for cables specified in this document, the restriction that HD 186 is only applicable to cables with more than five cores does not apply.

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

4.3 Telecommunication Units

It shall be permitted to introduce telecommunication units into the cable construction subject to the following conditions:

- units shall be chosen from copper pairs or copper coaxial or optical fibres;
NOTE: Two pairs may alternatively be included as a quad.
- units shall have a diameter equal or very close to the diameter of insulated cores;
- preferably the number of telecom units in a cable shall not exceed three;
- the position of units shall be central and symmetrical;
- thickness (e_2) of the cable sheath, where measured over telecommunication units, shall comply with the requirements for minimum thickness (see 5.1.3.5 and 5.2.3.5) but shall not be taken into account when calculating the mean value.
- the colour or identification of the outer sheath over units shall not conflict with that of the cores in 4.2. However, no restriction shall be placed on colours used for insulations under an outer sheath.

5. PARTICULAR REQUIREMENTS FOR THE CONSTRUCTION OF CABLES

5.1 Flat PVC sheathed flexible cables for low rise lifts

5.1.1 Code designation

Without strain bearing members

H05VVH6-F

With strain bearing members

H05VVD3H6-F

5.1.2 Rated voltage

300/500 V

5.1.3 Construction

5.1.3.1 Conductor

Material: copper

Number of conductors: 4 up to 24

Cross sections: 0,75 and 1 mm²

The conductors shall be in accordance with the requirements of Class 5 given in HD 383.

5.1.3.2 Insulation

The insulation shall be PVC compound of type TI 2 of HD 21.1 applied around each conductor.

The insulation thickness shall comply with the specified value in Table 3, and shall be measured in accordance with sub-clause 5.2.3 of HD 21.1.

The insulation resistance at 70°C shall be not less than the values given in Table 3.

5.1.3.3 Assembly of cores

The preferred number of cores for the composition of the cables are given in Table 1, according to the nominal cross sectional areas of conductors.

Table 1

Nominal cross-sectional area mm ²	Preferred number of cores
0,75	6, 9, 12, 16, 18, 20 and 24
1	4, 5, 6, 9, 12, 16, 18, 20, and 24

The cores shall be laid parallel and covered with the sheath.

The cores shall be grouped, lying closely side by side in groups of 2 to 5 cores

For cables having the preferred number of cores, given in Table 1, the grouping shall comply with Table 2.

Table 2

Number of cores	6	9	12	16	18	20	24
Number of groups x Number of cores in group	2x3	3x3	3x4	4x4	2x4 + 2x5	5x4	6x4
NOTE: A trip-cord may be added inside each core group.							

It shall be possible to separate the cores without damage to the insulation.

5.1.3.4 Strain bearing member (sbm)

A strain bearing member (or members) either of textile material or of metal may be included in the cable, but shall be separated from the core groups.

NOTE: It is permitted to apply a protective surface coating to the sbm.

The sbm shall preferably be located on the edges of the cable in a symmetrical position and shall be easily separable from the cable, without damage to the cores, when separate terminations of the sbm are necessary.

5.1.3.5 Sheath

The sheath shall be PVC compound of type TM 2 of HD 21.1 applied so as to substantially avoid the formation of cavities. The sheath shall not stick to the cores.

The sheath thickness shall be measured and evaluated generally in accordance with sub-clause 1.10 of HD 21.2, with the following exceptions:

Measurements shall be taken as follows (Fig. 1):

- e_1 the clearance (e_1) separating groups of cores shall not at any place be less than the value specified in Table 3.
- e_2 the thickness on both flat sides (e_2 in Figure 1) shall be measured in each core group at the place where the sheath is thinnest; the opposite thickness at the same core shall also be measured. The mean value of measurements above shall not be less than that specified in Table 3. The minimum value of e_2 at any place shall not be less than the specified value by more than 0,2 mm + 20% of the specified value.
- e_3 the thickness at the edge and the separation between sbm, if any, and cores shall be measured at both edges of the cable, along the major axis of the cross section. The mean value of measurements above shall not be less than that specified in Table 3. The minimum value of e_3 at any place shall not be less than the specified value by more than 0,2 mm +20% of the specified value.

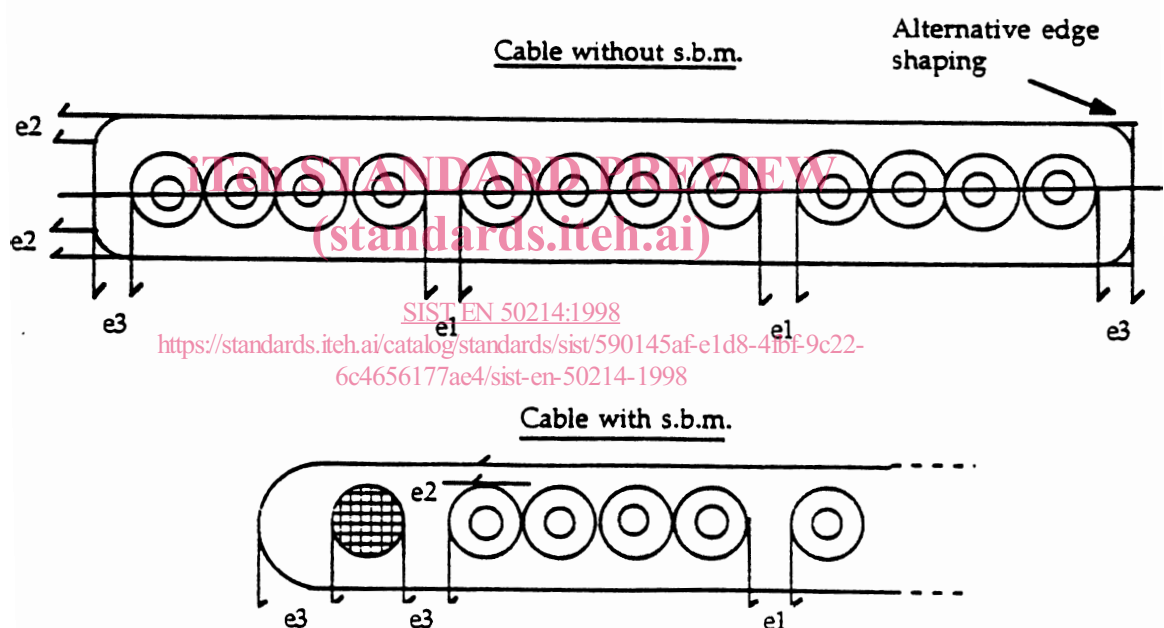


Figure 1

Table 3
General Data
Cables according to 5.1

Nominal cross-sectional area of conductors	Maximum diameter of wires in conductor	Thickness of insulation	Thickness of sheath and clearance			Minimum Insulation Resistance at 70°C
			e ₁ (min)	e ₂ (mean)	e ₃ (mean)	
mm ²	mm	mm	mm	mm	mm	MΩ.km
0,75	0,21	0,6	0,5	0,8	1,2	0,011
1	0,21	0,6	0,5	0,8	1,2	0,010

5.1.4 Tests

Compliance with the requirements of sub-clause 5.1.3 shall be checked by inspection and by the tests given in Table 6, for cables without sbm, and in Tables 6 and 7 for cables with sbm.

For the requirement of non adhesion between sheath and core, this shall be carried out by a manual test.

5.2 Flat PVC sheathed flexible cables for high rise, high speed lifts

5.2.1 Code designation

Without strain bearing members H05V3V3H6-F
With strain bearing members H05V3V3D3H6-F

5.2.2 Rated voltage

300/500 V

5.2.3 Construction

5.2.3.1 Conductor

Material: copper
Number of conductors: 12 up to 24
Cross sections: 0,75 and 1 mm²

The conductors shall be in accordance with the requirements of Class 5 given in HD 383.

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5.2.3.2 Insulation

The insulation shall be PVC compound complying with type TI 5 of HD 21.1, applied around each conductor.

The insulation thickness shall comply with the specified value in Table 5, and shall be measured in accordance with sub-clause 5.2.3 of HD 21.1.

The insulation resistance at 70°C shall be not less than the values in Table 5.

5.2.3.3 Assembly of cores

The cores shall be laid parallel and covered with the sheath.
The cores shall be grouped, lying closely side by side in groups of 4 to 5 cores.

The preferred number of cores and composition of the cables are given in Table 4.

Table 4

Number of cores	12	16	18	20	24
Number of groups x Number of cores in group	3x4	4x4	2x4 + 2x5	5x4	6x4
NOTE: A rip-cord may be added inside each core group.					

The green/yellow core, if any, shall be placed inside one of the inner core groups, and preferably next to either core number 7 or 8.

It shall be possible to separate the cores without damage to the insulation.

5.2.3.4 Strain bearing member (sbm)

A strain bearing member, or members, either of textile material or metal may be included in the cable, but shall be separated from the core groups.

NOTE: It is permitted to apply a protective surface coating to the sbm.

The use of sbm is compulsory for freely suspended lengths exceeding 45 m. Thus, the value of the freely suspended length for each particular contract shall be declared. The sbm shall preferably be located on the edges of the cable in a symmetrical position and shall be easily separable from the cable, without damage to the cores, when separate terminations of the sbm are necessary.

5.2.3.5 Sheath

The sheath shall be PVC compound of type TM 4 of HD 21.1, applied so as to substantially avoid the formation of cavities. The sheath shall not stick to the cores.

SIST EN 50214:1998

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The sheath thickness shall be measured and evaluated generally in accordance with sub-clause 1.10 of HD 21.1 with the following exceptions:

Measurements shall be taken as follows (Fig. 1):

- e₁ the clearance (e₁) separating groups of cores shall not at any place be less than the value specified in Table 5.