BS EN 50525-2-71:2011

BSI Standards Publication

# Electric cables — Low voltage energy cables of rated voltages up to and including 450/750 V ($U_0/U$)

## Part 2-71: Cables for general applications — Flat tinsel cables (cords) with thermoplastic PVC insulation

**National foreword**

This British Standard is the UK implementation of EN 50525-2-71:2011.

In the UK, the BS EN 50525 series of standards contain complex supersession details. The table below best summarizes the relationship between these standards:

| Part 1 together with | Supersedes |
|---|---|
| 2-81 | BS 638-4:1996 |
| 2-41, 2-42 | BS 6007: 2006 |
| 2-11 (in part), 2-12, 2-21 (in part), 2-71 | BS 6500:2000 |
| 2-11 (in part), 2-21 (in part), 2-51 (in part), 2-83, 3-21 | BS 7919:2001 |
| 2-31, 2-51 (in part) | **BS 6004:2000** |
| 3-41 | **BS 7211:1998** |
| 2-22, 2-72, 2-82, 3-11, 3-31 | None |

*NOTE All British Standards will remain current until they are withdrawn on 31 December 2012. British Standards in bold are only partially superseded, and new editions of BS 6004 and BS 7211 will be introduced on 1 January 2013.*

National Annex NA (informative) gives information on the origins and identification of particular cable types.

The UK participation in its preparation was entrusted to Technical Committee GEL/20/17, Electric Cables - Low voltage.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.



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**Compliance with a British Standard cannot confer immunity from legal obligations.**

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2011.

**Amendments issued since publication**

| Date | Text affected |
|---|---|

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 50525-2-71

May 2011

ICS 29.060.20

Supersedes HD 21.5 S3:1994 (partially) + A1:1999 (partially) + A2:2001 (partially)

English version

# Electric cables - Low voltage energy cables of rated voltages up to and including 450/750 V ($U_0$/$U$) - Part 2-71: Cables for general applications - Flat tinsel cables (cords) with thermoplastic PVC insulation

Câbles électriques -
Câbles d'énergie basse tension de tension assignée au plus égale à 450/750 V ($U_0$/$U$) -
Partie 2-71: Câbles pour applications générales -
Câbles plats pour cordons à fil rosette, isolés en PVC thermoplastique

Kabel und Leitungen -
Starkstromleitungen mit Nennspannungen bis 450/750 V ($U_0$/$U$) -
Teil 2-71: Starkstromleitungen für allgemeine Anwendungen -
Lahnlitzen-Leitungen mit thermoplastischer PVC-Isolierung

This European Standard was approved by CENELEC on 2011-01-17. 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.

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CENELEC

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

**Management Centre: Avenue Marnix 17, B - 1000 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 formal vote and was approved by CENELEC as EN 50525-2-71 on 2011-01-17.

This document, which is one of a multipart series, supersedes Clause 2 of HD 21.5 S3:1994 + A1:1999 + A2:2001.

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

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) | 2012-01-17 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2014-01-17 |

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## 1 Scope

This European Standard applies to thermoplastic (PVC) insulated flexible flat tinsel flexible cables.

The cables are of rated voltage $U_0/U$ 300/300 V.

The cables are intended for the connection of small appliances to the fixed supply.

The maximum conductor operating temperature for the cable in this standard is 40 °C.

NOTE HD 516 contains extensive guidance on the safe use of cables in this standard.

This EN 50525-2-71 should be read in conjunction with EN 50525-1, which specifies general requirements.

## 2 Normative references

The following referenced documents are indispensable for the application 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.

NOTE One or more references to the standards below are in respect of a specific sub-division of that standard, for instance a clause, a table, a class or a type. Cross-references to these standards are undated and, at all times, the latest version applies.

| | |
|---|---|
| EN 50363-3 | Insulating, sheathing and covering materials for low voltage energy cables − Part 3: PVC insulating compounds |
| EN 50395 | Electrical test methods for low voltage energy cables |
| EN 50396 | Non electrical test methods for low voltage energy cables |
| EN 50525-1 | Electric cables - Low voltage energy cables of rated voltages up to and including 450/750 V ($U_0/U$) − Part 1: General requirements |
| EN 60332-1-2 | 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 (IEC 60332-1-2) |
| EN 60811-1-4 | Insulating and sheathing materials of electric and optical cables − Common test methods − Part 1-4: General application − Tests at low temperature (IEC 60811-1-4) |

## 3 Terms and definitions

For the purposes of this document the terms and definitions given in Clause 3 of EN 50525-1 apply.

## 4 Flexible cables – H03VH-Y

### 4.1 Construction

#### 4.1.1 Conductor

Each flexible tinsel cable shall be constructed from two conductors.

Each conductor shall comprise a number of strands or groups of strands, twisted together, each strand being composed of one or more flattened wires of copper or copper alloy, helically wound on a thread of cotton, polyamide or similar material.

The two conductors shall be laid parallel.

#### 4.1.2 Insulation

The two parallel conductors shall be covered with the insulation. The insulation shall be polyvinyl chloride compound of Type TI 2 to EN 50363-3.

The insulation shall be provided with a groove on both sides, between the conductors, to facilitate separation of the cores.

#### 4.1.3 Marking

The cable shall be marked with the CENELEC code H03VH-Y. The marking shall comply with Clause 6 of EN 50525-1.

### 4.2 Requirements

Each cable shall comply with the appropriate requirements given in EN 50525-1, and the particular requirements of this Part.

Testing shall be in accordance with Annex A.

The dimensions of the cables shall be within the limits specified in columns 2 and 3 of Table B.1.

The conductor resistance shall not exceed the value given in column 5 of Table B.1.

The requirements for the mechanical test on completed cables shall be in accordance with Annex C.

# Annex A
(normative)

# Tests for cables to EN 50525-2-71

**Table A.1**

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Ref No.** | **Tests** [a] | **Category of test** | **Test method described in** | |
| | | | **EN** | **(Sub)clause** |
| **1** | **Electrical tests** [b] | | | |
| 1.1 | Resistance of conductors | T, S | 50395 | 5 |
| 1.2.1 | Voltage test at 2 000 V | T, S | 50395 | 5 |
| 1.3 | Insulation resistance at 70 °C | T, S | 50395 | 8.1 |
| 1.4 | Long term resistance of insulation to d.c. | T | 50395 | 9 |
| 1.5 | Absence of faults in insulation | R | 50395 | 10 |
| **2** | **Constructional and dimensional tests** | | | |
| 2.1 | Checking of compliance with constructional provisions | T, S | 50525-1 | Inspection and manual tests |
| 2.2 | Measurement of thickness of insulation | T, S | 50396 | 4.1 |
| 2.3 | Measurement of overall diameter | T, S | 50396 | 4.4 |
| **3** | **Insulation material tests** | T | 50363-3 [c] | - |
| **4** | **Mechanical strength of completed cable** | | | |
| 4.1 | Bending test | T | 50396 | 6.4 |
| 4.2 | Snatch test | T | 50396 | 6.7 |
| **5** | **Impact test at - 5 °C** | T | 60811-1-4 | 8.5 |
| **6** | **Test under fire conditions** | T | 60332-1-2 | - |

[a] All tests are applicable to these cables. The order given does not imply a sequence of testing.

[b] Particular test conditions and requirements are given in Table 1 of EN 50525-1.

[c] This EN includes all the test methods and requirements for the material. Material to be tested is taken from the finished cable.

# Annex B
(normative)

# General data

**Table B.1 — General data for Type H03VH-Y**

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Thickness of insulation specified value** | **Mean overall dimensions** | | **Minimum insulation resistance at 70 °C** | **Maximum conductor resistance at 20 °C** |
| | **Lower limits** | **Upper limits** | | |
| mm | mm | mm | MΩ.km | Ω/km |
| 0,8 | 2,2 × 4,4 | 3,5 × 7,0 | 0,019 | 270 |

# Annex C
(normative)

# Requirements for mechanical tests on completed cables

## C.1 Bending test

The test shall be carried out in accordance with 6.4 of EN 50396. During the test with 60 000 bending cycles i.e. 120 000 single strokes, interruption of the current shall not occur.

After the test, the sample shall withstand the voltage test carried out in accordance with Clause 6 of EN 50395, the voltage, however, being 1 500 V and applied only between the conductors connected together and the water.

## C.2 Snatch test

The test shall be carried out in accordance with 6.7 of EN 50396. During the test, interruption of the current shall not occur.

## Bibliography

HD 516 Guide to use of low voltage harmonized cables

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## **National Annex** (informative) **Origins and identification of the particular cable types**

As an aid to users, the table below shows, in respect of BS EN 50525-2-71:

— the identification of the particular cable types from BS 6500 that are now included in BS EN 50525-2-71;

— the location of the cables within BS EN 50525-2-71;

— any applicable United Kingdom and CENELEC cable codings (see also National Informative Annex B to BS EN 50525-1).

| **Pre-existing BS** | | **Clause in BS EN 50525-2-71** | **Cable type – Coding** | |
|---|---|---|---|---|
| **Number** | **Table** | | **United Kingdom (if applicable)** | **CENELEC** |
| BS 6500 | 24 | 4 | – | H03VH-Y |

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