SRI LANKA STANDARD 733 : 2016

UDC 621.315

SPECIFICATION FOR ELECTRIC CABLES – PVC INSULATED AND PVC SHEATHED CABLES FOR VOLTAGES UP TO AND INCLUDING 300/500 V, FOR ELECTRIC POWER AND LIGHTING

(Third Revision)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard

SPECIFICATION FOR ELECTRIC CABLES – PVC INSULATED AND PVC SHEATHED CABLES FOR VOLTAGES UP TO AND INCLUDING 300/500 V, FOR ELECTRIC POWER AND LIGHTING

(Third Revision)

SLS 733 : 2016

Gr. 14

SRI LANKA STANDARDS INSTITUTION
17, Victoria Place
Elvitigala Mawatha
Colombo 08
Sri Lanka

Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

This standard does not purport to include all the necessary provisions of a contract.

Contents

SRI LANKA STANDARD
SPECIFICATION FOR ELECTRIC CABLES – PVC INSULATED AND PVC SHEATHED CABLES FOR VOLTAGES UP TO AND INCLUDING 300/500 V, FOR ELECTRIC POWER AND LIGHTING
(THIRD REVISION)

FOREWORD

This Sri Lanka Standard was approved by the Sectoral Committee on Electric Cables and Conductors and was authorized for adoption as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2016-10-06. PVC Insulated and PVC sheathed cables are retained in this revised standard. This is the third revision.

The PVC Insulated Non Sheathed cables consisting of general purpose single core cables, cables for internal wiring and heat resisting cables in the earlier version(2005) together with oil resisting cables now come under the following new standards wherever applicable.

Cables for General Applications - single core non sheathed cables with thermoplastic PVC insulation **SLS 1504-2-31:2015.**

Cables for General Applications - Oil Resistant Control cables with thermoplastic PVC insulation **SLS 1504-2-51:2015.**

Furthermore General Requirements of all PVC cables are now covered under a new standard **SLS 1504-1-1:2015.**

Harmonized and UK code designations for cables are also given for information within the text where appropriate.

All values given in this standard is in SI units.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or an analysis shall be rounded off in accordance with **SLS 102**, in case if the method of rounding off is not specified in the text of this standard. The number of figures to be retained in the rounded off value, shall be the same as that of the specified value in this standard.

In the preparation of this standard, the assistance derived from **BS 6004: 2012** Electric cables - PVC insulated and PVC sheathed cables for voltages up to and including 300/500V, for electric power and lighting.

1. SCOPE

This Sri Lanka Standard specifies requirements and test methods for the construction and performance of cables that:

a) have a polyvinyl chloride (PVC) insulation of rated voltage 300/500 V;
b) are intended for electric power and lighting;

The types of cable included in this standard are:

a) PVC insulated, PVC sheathed cable 300/500 V, single-core 6181Y, flat twin 6192Y and flat 3-core 6193Y (see Table **3**);
b) PVC insulated, PVC sheathed cable with circuit protective conductor, 300/500 V, single core 6241Y, flat twin 6242Y and flat 3-core 6243Y (see Table **4**);
c) PVC insulated, PVC sheathed cable with or without circuit protective conductor, 300/500 V, single-core 6192Y, 6241Y and flat twin 6242Y (alternative conductor versions) (see Table **5**);
d) Ordinary duty low temperature PVC insulated and PVC sheathed flexible cable, 300/500 V, flat twin 3192A, circular-twin 3182A, 3-core 3183A, 4-core 3184A and 5-core 3185A (see Table **6**).

The insulation and other components are suitable to permit operation of the cables at a maximum sustained conductor temperature of 70 °C and for a maximum short-circuit conductor temperature of 160 °C (for a maximum period of 5 s).

NOTES:

1 Limitation on the temperature of the cables may be imposed in situations where they could be touched or where they could touch other materials.

2 In installations that include wiring accessories, junction boxes, and consumer units, etc., the performance of these accessories should be taken into account in deciding the maximum operating temperature of the cable.

*3 Annex **A** provides a guide to the cross-referencing of the traditional United Kingdom Cable Codes (formally known as the CMA codes) and harmonized CENELEC codes. Furthermore, Annex **B** gives information on the traditional UK cables transferred to **SLS 1504** series.*

*4 Annex **C** gives guidance on the use of the cables specified in this standard.*

*5 Annex **D** gives the compatibility test method*

*6 Annex **E** gives the voltage withstand test*

*7 Annex **F** gives notes on type tests.*

2. REFERENCES

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050 International Electro technical Vocabulary
Part 461: Electric cables

BS 7671 IET Regulations for Electrical Installations.

EN 50363-3 Insulating, sheathing and covering materials for low voltage energy cables

Part **3** : PVC insulating compounds.

SLS 102 Rules for rounding off numerical value

SLS 695 Conductors in insulated cables and cords

SLS 906 Spark testing of electric cables

SLS 1007 Methods of test on electric and optical fiber cables under fire conditions.

Part 1-2: 2008 Test for vertical flame propagation for a single insulated wire or cable- procedure for 1 kW per mixed flame.

Part 201: General test – Measurement of installation thickness.

SLS 1282 Insulating and sheathing material for electric cables.

Part 2: PVC insulating and sheathing compounds.

SLS EN 50395 Electric test methods for low voltage energy cables.

SLS EN 50396 Non electrical test methods for low voltage energy cables.

SLS IEC 60811 Electric and optical fiber cables-test methods for non-metallic materials

Part 401: environmental tests- thermal ageing methods-Ageing in an air oven.

Part 501: Mechanical tests-Tests for determining the mechanical properties of insulating and sheathing compounds.

3. TERMS AND DEFINITIONS

For the purposes of this standard, the terms and definitions given in **IEC 60050-461** and the following apply.

3.1 cable manufacturer : Organization that has the capability to both produce and control the conformity of cable made to **this standard.**

NOTE: *see 11.1a) for information on marking the cable manufacturer's name and identifier.*

3.2 length of lay : Axial length of one complete turn of the helix formed by one cable component.

3.3 nominal value : Value by which a quantity is designated.

NOTE: *Nominal values usually give rise to values to be checked by measurement taking into account specified tolerances.*

3.4 routine tests, R : Tests made on all production lengths of cable to demonstrate their integrity.

3.5 sample tests, S : Tests made on samples of completed cable, or components taken from a completed cable, adequate to verify that the finished product meets the design specifications.

3.6 type tests, T : Tests made before supplying, on a general commercial basis, a type of cable covered by this Standard, in order to demonstrate satisfactory performance characteristics to meet the intended application.

NOTE: *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.*

3.7 Voltage

3.7.1 ***maximum voltage, U_m*** : Maximum sustained power-frequency voltage between phase conductors for which the cable is suitable.

3.7.2 ***rated voltage, U_o*** : Nominal power-frequency voltage between phase conductor (s) and earth, for which the cable is suitable.

3.7.3 ***rated voltage, U :*** Nominal power-frequency voltage between phase conductors for which the cable is suitable.

4. RATED VOLTAGE

The cables shall be designated by the rated voltages U_o and U, expressed in the form U_o/U. The rated voltage recognized for the purpose of this standard shall be 300/500 V.

The maximum Permanent permitted operating voltages of the system shall be in accordance with Table **1.**

Table 1- Maximum permitted voltages against rated voltage of cable

Rated voltage of cable	Maximum permanent permitted operating voltage of the system			
	a.c.		d.c.	
U_0/U(V)	Conductor-earth U_0 max (V)	Conductor-Conductor U_m(V)	Conductor-earth V	Conductor-Conductor V
300/500	320	550	410	820

5. CONSTRUCTION

The construction of the cables shall be as specified in Table **3** to Table **6.**

6. CONDUCTORS

The conductors shall be annealed copper conforming to **SLS 695.** The class of conductor shall be as specified in Table **3** to Table **6.**

7. INSULATION

7.1 Type of insulation

The insulation shall be one of the following types, in accordance with Table **3** to Table **6**.

- TI 1 as specified in SLS 1282:Part 2
- TI 4 as specified in SLS 1282:Part 2

7.2 Application

The insulation shall be applied by an extrusion process to form a compact and homogeneous layer.

NOTES:

*1. The insulation can be applied in a single layer, or in a number of cohesive layers. Where more than one layer is used, all testing specified in this Standard shall be carried out on the complete insulation as though it were a single layer of the declared insulation type (see **7.1**).*

*2. Insulation applied in more than one layer does not conform to the definition of "double insulation" given, for instance, in **BS 7671**. (IET wiring regulation) When the application is tested by removing the insulation from the conductor, there shall be no damage to the insulation itself or the conductor.*

7.3 Thickness

The mean value of the radial thickness of the insulation, when measured in accordance with **SLS IEC 1199-201** shall be not less than the value given in Table **3** to Table **6**. The smallest value measured, t_m, shall not fall below 90 percent of the value given in Table **3** to Table 6 by more than 0.1 mm, i.e.:

$$t_m \geq 0.9t_n - 0.1$$

where;

t_m is the smallest value measured , in millimeters (mm),

t_n is the tabulated radial thickness, in millimeters (mm),

Conformity shall be checked on each core three samples shall be taken from the cable; each sample shall be separated from the next by a distance of at least 1 m.

The mean of the 18 values (expressed in millimeters) obtained from the three pieces of insulation from each core shall be calculated to two decimal places and rounded off as per **SLS 102**, and this shall be taken as the mean value of the thickness of insulation.
If in the calculation the second decimal figure is 5 or more first decimal figure shall be raised to the next number; thus for example, 1.74 shall be rounded to 1.7 and 1.75 to 1.8.

8. IDENTIFICATION OF CORES

8.1 General

The cores of all cables shall be identified by colour. Each core shall be identified by its colour as indicated in Table **3** to Table **6**.

NOTE: *Other colours may be used by agreement with the manufacturer; in this case the requirements in 11.2 do not apply.*

8.2 Core colours

The colour shall be applied throughout either the whole

insulation or the outer cohesive layer and shall be applied as part of the extrusion process.

The insulation of the coloured cores, irrespective of the method of colouring, shall be tested as a complete single layer (see **7.2).**

The colours of the cores, determined by the number of cores in the cable, and also the sequence of the colours shall be as given in Table **3** to Table **6**. Where alternative colours are used (see **8.1** note), the sequence shall be agreed with the manufacturer.

On a core with the bi-colour combination of green-and-yellow, the distribution of these colours shall be such that for every 15 mm length of core one for these colours shall cover not less than 30 percent and not more than 70 percent of the surface of the core, while the other colour shall cover the remainder of the surface. Conformity shall be checked by measurement.

NOTES:

1. In cases of dispute regarding the green-and-yellow combination, and where appropriate to the method of the colour marking of the insulation, a suitable test method for checking conformity is given in ***Clause 5.2*** *of* ***SLS EN 50396.***

2. It is understood that the colours green and yellow, when they are combined as specified, are recognized as identifying exclusively the core intended for use as an earth connection or similar protection. The colour blue is for the identification of the core intended to be connected to neutral but, if there is no neutral, blue may be used to identify any core except for the earth or protective conductor.

3. Depending on where the cables are used, restrictions may apply to the use of certain colours for some applications.

8.3 Clarity and durability

The colour used for core identification shall be clearly identifiable and durable. Conformity shall be checked by trying to remove the colour of the cores by rubbing the core lightly 10 times with a piece of cotton wool or cloth soaked in water.

9. MULTI-CORE CIRCULAR CABLES

The cores of the 2-core, 3-core, 4-core and 5-core circular cables shall be laid up together. Cores shall be laid up in the sequence of colours as given in Table **6**. If alternative core colours to those specified in Table **6** are used, then an alternative sequence shall be agreed with the manufacturer.

Conformity shall be checked by visual examination.

The maximum length of lay for circular cables shall be not more than 25 times the diameter of the assembly of laid up cores.

Conformity shall be checked in accordance with **15.5.**

10. SHEATH

10.1 Type of sheath

The sheath shall be an extruded layer of PVC of one of the following types, in accordance with Table **3** to Table **6**.

- Type **6** as specified in **SLS 1282-2**.
- Type **10** as specified in **SLS 1282-2**.

10.2 Application

The sheath shall be applied by an extrusion process.

NOTE: *The sheath can be applied in a single layer or in a number of cohesive layers.*

Where more than one layer is used, all testing specified in this standard shall be carried out on the complete sheath as though it were a single layer of the declared sheath type (see **10.1**).

When the sheath is removed, there shall be no damage to the core insulation when visually checked.

10.3 Thickness

When measured in accordance with **Clause 4.2** or **4.3** of **SLS EN 50396 as** applicable, the smallest value, t_m, of the radial thickness of the sheath shall not fall below 85 percent of the value given in Table **3** to table **6** by more than 0.1 mm, ie.:

$$t_m \geq 0.85\ t_n - 0.1$$

where:

t_m is the smallest value measured, in millimeters (mm);

t_n is the tabulated radial thickness, in millimeters(mm);

One sample of cable shall be taken from each of three places, separated by at least 1 m. The mean of all the values (expressed in millimeters) obtained from the three pieces of sheath shall be calculated to two decimal places and rounded off as follows, and this shall be taken as the mean value of the thickness of sheath.

If in the calculation the second decimal figure is 5 or more first decimal figure shall be raised to the next number; thus for example, 1.74 shall be rounded to 1.7 and 1.75 to 1.8.

10.4 Colour

The colour shall be applied throughout either the whole sheath or the outer cohesive layer and shall be applied as part of the extrusion process.

The sheath, irrespective of the method of colouring, shall be tested as a compete single layer (**see 10.2**).

The colour of the sheath shall be as specified in Table **3** to Table **6.**

11. CABLE MARKING AND ADDITIONAL INFORMATION

11.1 External marking

The external surface of all cables conforming to this Standard shall be legibly marked with the following elements:

	Elements	Example of marking
a)	Cable manufacturer	Manufacturer's name and their unique factory identifier

NOTES:
1. A simplified version of the manufacturer's name, or a trading name of the manufacturer, may be used in place of the full name.

2. Any suitable method may be used to unambiguously identify the manufacture's factory.

3. The manufacture's own trademark or equivalent may be added but this cannot be used instead of the manufacturer's name or identifier.

b)	Electric cable	ELECTRIC CABLE
c)	Voltage designation	300/500 V
d)	UK cable code	6242Y

NOTE: *There relevant UK cable code is given in Table **3** to Table **6**.*

e)	Number of cores, nominal area of conductor conductor and circuit protective conductor as appropriate	i) 3x1.5* ii) 2x1.5+1.0**
f)	Year of manufacture	yyyy

NOTE: *The year of manufacture may take the form of actual year (e.g 2013) or a Coded year identifier assigned by the manufacturer.*

g)	Standard core colour identifier	H

NOTES:

1. *See **11.2.**The marking of items a) to g) shall be by embossing, printing or indenting on the sheath. The markings shall appear along the axis of the cable in any sequence that is deemed to neither confuse nor conflict.*

2. *The order in which the elements of marking appear along the length of the external sheath is not prescribed, but it is preferred that they be in the order a) to h) as shown in this sub clause.*

The letters and figures shall consist of upright, block characters.

The distance between the end of one element of the marking and the beginning of the next identical element of the marking shall be not more than 550 mm in accordance with Figure **1**.

Conformity of the marking shall be checked by visual examinations and measurement of at least two sets of elements. If the mark is done by printing, conformity shall be checked by trying to remove the colour by rubbing lightly 10 times with a piece of cotton wool or cloth soaked in water.

---

* 3×1.5 indicates a 3-core cable with 1.5 mm^2 conductors.

** 2×1.5 + 1.0 indicates a 2-core cable with 1.5 mm^2 conductors and a 1.0 mm^2 CPC.

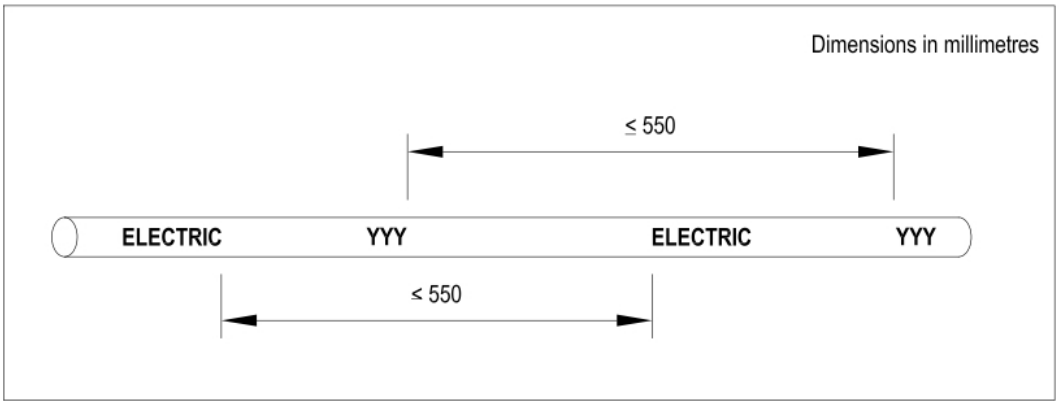

Figure1. An example of the marking as used on the outer sheath of the cable

11.2 Standard core colour identifier

When the core colour combinations are used in accordance with Table **3** to Table **6**, the letter "H" shall be included in the marking on the external sheath of the cable in accordance with **11.1.**

11.3 The mark of an approval organization

If the mark of an approval organization is used, it shall be embossed, indented or printed throughout the length of the external sheath of the cable.

The mark shall be in the form of symbol(s) specified by the approval organization, and the maximum distance between marks shall be not greater than 1 100 mm.

11.4 Additional information

Any additional information shall be embossed, indented or printed throughout the length of the external sheath of the cable.

The additional information shall be in one continuous string so that it does not conflict with, confuse nor render illegible the marking in **11.1**, **11.2** and **11.3**. The repeat interval shall not exceed 1100 mm.

Where the information is applied by printing, it shall be durable so that it cannot be removed when tested in accordance with Clause **5.1** of **SLS EN 50396.**

Conformity shall be checked by trying to remove the colour by rubbing lightly 10 times with a piece of cotton wool or cloth soaked in water.

11.5 Packaging

The cable shall be wound on reels or drums, or supplied in coils, packed and labeled. The minimum diameter of the reel, drum or coil shall not be less than twenty times the diameter of the cable.

11.5.1 Package

The label on the packed reel, drum or coil shall contain the following information:

a) Name of manufacture and trade mark;

b) Nominal dimensions of the conductor of the cable;

c) Type of cable and voltage rating;

d) Number of cores;

e) Core colours; and

f) Length of cable contained in reel, drum or coil.

12. SCHEDULE OF TESTS

The tests to be performed on cables specified in this standard shall be as specified in Table **2**, which refers to the relevant clauses of the standard specifying the requirements and test methods as well as the category of each test which applies, i.e. T, S or R (as defined in Clause **3**).

13. TEST CONDITIONS

13.1 Temperature

Tests shall be performed at the temperature of (20±15) ºC unless otherwise specified in the details for a particular test.

13.2 Frequency and waveform of power frequency test voltages

The frequency of the alternating test voltages shall be in the range of 49 Hz to 61 Hz unless otherwise specified in the details for a particular test. The waveform shall be substantially sinusoidal.

Table 2 Schedule of tests

Test (1)	**Requirement given in clause** **(2)**	**Test method** (3)	**Test Category** **(4)**
Conductor construction	6	SLS 695	S
Insulation: material application thickness	 7.1 7.2 7.3	 EN 50363-3 Visual examination and manual test SLS EN 50396, 4.1	 T S S
Core identification: colour clarity and durability assembly and core colour sequence	 8.2 8.3 9	 Visual examination SLS EN 50396, 5.1 Visual examination	 S S S
Length of lay of assembled cores	9	15.5	S
Sheath: • material • application • thickness • colour	 10.1 10.2 10.3 10.4	 SLS 1282 Visual examination SLS EN 50396, 4.2 or 4.3 Visual examination	 T S S S
Cable marking	11	Visual examination and measurement	S
Durability of printed information	11.4	SLS EN 50396, 5.1	T
Conductor resistance	14.2	SLS 695	R
Absence of faults on the insulation	14.3	SLS 906, SLS EN 50395, 10.3	R
Mean overall dimensions	15.2	SLS EN 50396, 4.4,	S
Ovality	15.3	SLS EN 50396, 4.4	S
Voltage withstand	15.4	Annex **E**	S
Insulation resistance	16.2	SLS EN 50395, 8.1	T
Voltage test on cores	16.3	SLS EN 50395,Clause **7**	T
Long term resistance to d.c.	16.4	SLS EN 50395,Clause **9**	T
Compatibility	16.5	Annex **D**	T
Flame propagation on single cable	16.6	SLS 1007-1.2	T
Flexing test	16.7	SLS EN50396, 6.2, SLS EN 50395, Clause **7**	T

NOTES:

1 Tests classified as sample(S) or routine(R) might be required as part of a type approval scheme.

2 The order of the tests in this schedule does not imply a sequence of testing.

14. ROUTINE TESTS

Commentary

In some tests, the preparation and presentation of the test samples can have a critical affect on the result of the tests so test samples should always be prepared carefully.

14.1 General

Routing tests shall be performed in accordance with Table **2** as indicated by the symbol "R" in Column **4**.

NOTE: *The requirements for routing testing that are not fully covered by earlier clauses are detailed in **14.2** and **14.3**.*

14.2 Conductor resistance

The cable shall be kept in the test area for sufficient time to ensure that the conductor temperature has reached a level which permits an accurate determination of resistance using the correction factors given in **SLS 695.**

The d.c. resistance of each conductor shall conform to **SLS 695** when measured in accordance with **SLS 695** Annex A, and corrected to 20 ºC. The measurement shall be made on a complete drum length or on a1 m sample taken from the drum, at room temperature and record the temperature at which the measurement is made. Adjust the measured resistance by means of the correction factors given in **SLS 695**.

Calculate the resistance per kilometer length of cable from the length of the complete cable and not from the individual core or wires.

If necessary, correction to 20 ℃ and 1 km length shall be made by applying the following formula:

$$R_{20} = R_t \times k_t \times \frac{1000}{L}$$

Where;

k_t is the temperature correction factor from Table **5** of **SLS 695;**
R_{20} is the conductor resistance at 20 °C, in Ω/km;
R_t is the measured conductor resistance, in Ω; and
L is the length of cable, in m.

14.3 Test to check the absence of faults on the insulation

14.3.1 Test for single-core circular cable

The completed single – core circular cable shall be tested in accordance with the a.c. or d.c. test method at the test voltage stated in **SLS 906**, (insulation and sheath combined) and there shall be no breakdown of the insulation or sheath.

14.3.2 Test for flat cable and multi -core circular cable

The completed flat cable or multi-core circular cable shall be tested in accordance with Clause 10.3 of SLS **EN 50395**, having either a test voltage of 2000 V a.c. r.m.s. or 5000 V d.c., for 5 minutes between each conductor and all the other conductors connected to earth and there shall be no breakdown of the insulation.

Single-core flat cable, with an un insulated circuit protective conductor (6241Y) shall have the test voltage applied to the core, and the un insulated circuit protective conductor shall be earthed.

15. SAMPLE TESTS

COMMENTARY

In some tests, the preparation and presentation of the test samples can have a critical affect on the result of the tests samples should always be prepared carefully.

15.1 General

Sample tests shall be performed in accordance with Table **2** as indicated by the symbols "S" in Column **4**.

NOTE: *The requirements for sample testing that are not fully covered by earlier clauses are detailed in **15.2** and **15.3**, **15.4** and **15.5.***

15.2 Mean overall dimensions

When tested in accordance with **Clause 10.3** of **SLS EN 50395,** the mean overall diameter of circular cables and the mean overall dimension of flat cables shall be within the limits is specified in Table **3** to Table **6**.

A test sample shall be taken from a cable from 3 places, separated by not less than 1 m. for circular cables; the mean of the six values obtained shall be taken as the mean overall diameter. For flat cables, the mean of each set of 3 values, for major and minor axis, respectively, shall be taken as the relevant overall dimension.

15.3 Ovality of circular cables

The difference between any two values of overall diameter of circular sheathed cables at the same cross – sections shall not exceed 15% of the upper limit for the mean overall diameter given in Table **3** and Table **6** when tested in accordance with Clause 4.4 of **SLS EN 50396.**

A test sample shall be taken from a cable from 3 places, separated by not less than 1 m.

Two measurements shall be taken at the same cross-section of the cable, covering the maximum and minimum values.

15.4 Voltage withstand

When tested in accordance with Annex **E**, no breakdown of the insulation shall occur.

15.5 Length of lay

The length of lay shall be determined by measuring the length of two pitches of a laid up assembly taken from a sample of cable and calculating the average of these two lengths. The result shall be taken as the length of lay of the laid – up cores.

16. TYPE TESTS

Commentary on Clause **16**

In some tests, the preparation and presentation of the test samples can have a critical affect on the result of the tests samples should always be prepared carefully.

16.1 General

Type tests shall be performed in accordance with Table **2** as indicated by the symbols "T" in *Column 4.*

NOTES:
*1. The requirements for type testing that are not fully covered by earlier clauses are detailed in **16.2, 16.3, 16.4, 16.5, 16.6 and 16.7.***

*2. Informative notes of type tests can be found in Annex **F.***

16.2 Insulation resistance

When the cores are tested in accordance with Clause **8.1** of **SLS EN 50395**, under the following conditions:

a) Period of immersion in water: minimum 2 h ;
b) Temperature of water of cables in Table 3, 4 and 5 : (70±2) ºC; and
c) Temperature of water of cables in Table 6: (60 ± 2) ºC;

none of the resulting values shall be below the minimum insulation resistance value specified in Table **3** to Table **6**.

16.3 Voltage test on cores

When the cores are tested in accordance with Clause **7** of **SLS EN 50395**, under the following condition:

a) Period of immersion in water: minimum 1 h ;
b) Temperature of water:(20±5)ºC;
c) Applied voltage (a.c.) according to the tabulated thickness of insulation:
   - Up to and including 0.6 mm: 1500 V;
   - Exceeding 0.6 mm: 2000V; and
d) Duration of each application of voltage: minimum 5 min;
   there shall be no breakdown of the insulation.

16.4 Long term resistance to d.c.

When the cable is tested in accordance with Clause **9** of **SLS EN 50395**, under the following test conditions:

a) temperature of the aqueous solution: (60±5) °C;
b) applied voltage (d.c.): 220 V; and

c) period of immersion in the aqueous solution, and duration of application of voltage: minimum 240 h;

The insulation shall not break down nor shall the exterior of the insulation show damage. Discoloration of the insulation shall be ignored.

16.5 Compatibility

When a sample of complete is cable is aged in accordance with **D.2,** the insulation and the outer sheath shall conform to the requirements given in Table **D.1**. In addition, at the end of the test period in the test period in the oven, the blotting paper shall be free of stains.

16.6 Flame propagation of a single cable

When tested in accordance with **SLS 1007: Part 1-2,** the completed cable shall conform to Annex **A** of **SLS 1007: Part 1-2**.

16.7 Two pulley flexing test

The cables in Table 6 shall be tested in accordance with Clause **6.2** of **SLS EN 50396,** and Clause **7** of **SLS EN 50395**, and shall conform to the following requirements:

a) During the test of 30 000 cycles, i.e. 60 000 single movements, there shall be:
- no interruption of the current;
- no short circuit between the conductors;
- no short circuit between the cable and the pulley wheels (the flexing apparatus);and

b) After the required number of cycles the sheath shall be examined under normal or corrected vision.

There shall be no point at which any underlying component of the cable (for instance tapes, insulated cores, etc.) shall be visible through a break in the sheath. The sheath of the cable shall then be removed.

The cores from the cable, without its sheath, shall be tested in accordance with **16.3** and there shall be no breakdown of the insulation.

TABLE 3 – PVC insulated, PVC sheathed cable, 300/500 V, single core 6181Y, flat twin 6192Y and flat 3 core 6193Y.
Construction

Conductor: annealed copper conductor, Class **1** and Class **2** as shown in column 2;
Insulation : PVC Type **TI 1**;
Sheath : PVC Type **6**.

Colours for core identification:

Single Core: brown or blue;
Twin : brown and blue, alternatively, for 2 x 1.0 and 2 x 1.5 cables, brown and brown;
3-core : brown, black (centre core) and grey.

Position of CPC
twin; centrally placed between cores in same plane;
3-core: centrally placed between black and grey cores in same plane.

Colour of sheath:
Grey (other colours may be used by agreement between manufacturer and customer)

Number and Nominal Cross sectional area of conductors mm^2	Class of conductor	Radial thickness of insulation mm	Radial thickness of sheath mm	Mean overall dimensions		Minimum insulation resistance at 70 °C MΩ km
				Lower limit mm	Upper limit mm	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
6181Y						
1 x 1.0	1	0.6	0.8	3.7	4.5	0.011
1 x 1.5	1	0.7	0.8	4.2	5.0	0.011
1 x 1.5	2*	0.7	0.8	4.2	5.2	0.011
1 x 2.5	1	0.8	0.8	4.8	5.7	0.010
1 x 2.5	2*	0.8	0.8	4.8	5.9	0.010
1 x 4	2	0.8	0.9	5.5	6.7	0.007 7
1 x 6	2	0.8	0.9	6.0	7.3	0.006 5
1 x 10	2	1.0	0.9	7.3	8.8	0.006 5
1 x 16	2	1.0	1.0	8.4	10.1	0.005 2
1 x 25	2	1.2	1.1	10.0	12.1	0.005 0
1 x 35	2	1.2	1.1	11.1	13.5	0.004 4
6192Y						
2 x 1.0	1	0.6	0.9	3.9 x 6.1	4.8 x 7.4	0.011
2 x 1.5	1	0.7	0.9	4.4 x 7.0	5.3 x 8.5	0.011
2 x 2.5	1	0.8	1.0	5.1 x 8.4	6.2 x 10.1	0.010
2 x 4	2	0.8	1.0	5.7 x 9.5	6.9 x 11.5	0.007 7
2 x 6	2	0.8	1.1	6.4 x 10.8	7.8 x 13.0	0.006 5
2 x 10	2	1.0	1.2	7.9 x 13.4	9.5 x 16.2	0.006 5
2 x 16	2	1.0	1.3	8.9 x 15.4	10.8 x 18.6	0.005 2
6193Y						
3 x 1.0	1	0.6	0.9	3.9 x 8.4	4.8 x 10.1	0.011
3 x 1.5	1	0.7	0.9	4.4 x 9.6	5.3 x 11.7	0.011
3 x 2.5	1	0.8	1.0	5.1 x 11.6	6.2 x 14.0	0.010
3 x 4	2	0.8	1.1	5.9 x 13.5	7.1 x 16.3	0.007 7
3 x 6	2	0.8	1.1	6.4 x 15.1	7.8 x 18.2	0.006 5
3 x 10	2	1.0	1.2	7.9 x 19.0	9.5 x 23.0	0.006 5
3 x 16	2	1.0	1.3	8.9 x 21.8	10.8 x 26.3	0.005 2

* Class 2 having 7 strands only

TABLE 4 - PVC insulated, PVC sheathed cable with circuit protective conductor (CPC), 300/500V, single-core 6241Y, flat twin 6242Y and flat 3-core 6243Y.

Construction

Conductor : annealed copper conductor, Class **1** and Class **2** as shown in Column **2;**
Insulation : PVC Type **T1 1**.
Sheath : PVC Type **6**

Colours for core identification:

Single-core: brown or blue
twin : brown and blue, alternatively, for 2 x 1.0 and 2 x 1.5 cables, brown and brown;
3-core : brown, black (centre core) and grey

Position of CPC

twin : Centrally placed between cores in same plane.
3-core : Centrally placed between black and grey cores in same plane.

Colour of sheath: Grey, (other colours may be used by agreement between manufacture and customer)

Number and nominal cross sectional area of conductors, mm^2	**Class of conductor**	**Radial thickness of insulation, mm**	**Radial thickness of sheath, mm**	**Mean overall dimensions**		**Circuit protective conductor, minimum nominal cross sectional area, mm^2**	**Class of CPC**	**Minimum insulation resistance at 70 °, MΩ km**
				Lower limit, mm	**Upper limit, mm**			
(1)	(2)	(3)	(4)	(4)	(5)	(6)	(7)	(8)
6241Y								
1 x 1.0	1	0.6	0.9	3.9 x 5.0	4.8 x 6.0	1.0	1	0.011
1 x 1.5	1	0.7	0.9	4.4 x 5.4	5.3 x 6.6	1.0	1	0.011
6242Y								
2 x 1.0	1	0.6	0.9	3.9 x 7.2	4.8 x 8.7	1.0	1	0.011
2 x 1.5	1	0.7	0.9	4.4 x 8.1	5.3 x 9.7	1.0	1	0.011
2 x 2.5	1	0.8	1.0	5.1 x 9.6	6.2 x 11.7	1.5	1	0.010
2 x 4	2	0.8	1.0	5.7 x 10.8	6.9 x 13.1	1.5	1	0.007 7
2 x 6	2	0.8	1.1	6.4 x 12.4	7.8 x 15.0	2.5	1	0.006 5
2 x 10	2	1.0	1.2	7.9 x 15.6	9.5 x 18.9	4	2	0.006 5
2 x 16	2	1.0	1.3	8.9 x 18.1	10.8 x 21.9	6	2	0.005 2
6243Y								
3 x 1.0	1	0.6	0.9	3.9 x 9.4	4.8 x 11.4	1.0	1	0.011
3 x 1.5	1	0.7	0.9	4.4 x 10.7	5.3 x 12.9	1.0	1	0.011
3 x 2.5	1	0.8	1.0	5.1 x 12.6	6.2 x 15.3	1.5	1	0.010
3 x 4	2	0.8	1.1	5.9 x 14.8	7.1 x 17.9	1.5	1	0.007 7
3 x 6	2	0.8	1.1	6.4 x 16.8	7.8 x 20.2	2.5	1	0.006 5
3 x 10	2	1.0	1.2	7.9 x 21.3	9.5 x 25.7	4	2	0.006 5
3 x 16	2	1.0	1.3	8.9 x 24.6	10.8 x 29.7	6	2	0.005 2

NOTE: *When required by the purchaser, alternative conductor version of certain sizes may be available in the form given in Table **5**.*

TABLE 5– PVC insulated, PVC sheathed cable with or without circuit protective conductor (CPC), 300/500 V, single core 6241Y and flat twin (6192Y and 6242Y) (alternative conductor versions)

Construction:

Conductor : annealed copper conductor, Class **2** as shown in Column **2**;
CPC : Class 1;
Insulation : PVC Type **T1 1L**;
Sheath : PVC Type **6**

Colours for core identification:

Single core: brown or blue
twin: brown and blue, alternatively, for 2 x 1.0 and 2 x 1.5 cables, brown and brown;

Position of CPC:
Twin: centrally placed between cores in same plane.

Colours of sheath:
grey (other colours may be used by agreement between manufacture and customer).

Number and Nominal Cross sectional area of conductor, mm^2	**Class of conductor**	**Radial thickness of insulation, mm**	**Radial thickness of sheath mm**	**Mean overall dimensions**		**Circuit protective conductor, minimum nominal cross- sectional area, mm^2**	**Class of CPC**	**Minimum insulation resistance at 70 °C MΩ km**
				Lower limit mm	**Upper limit mm**			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6192Y								
2 x 1.5	2	0.7	0.9	4.5 x 7.2	5.4x 8.7	--	--	0.011
2 x 2.5	2	0.8	1.0	5.2 x 8.5	6.3x10.3	--	--	0.010
6241Y								
1 x 1.5	2	0.7	0.9	4.5 x 5.5	5.4 x 6.7	1.0	1	0.011
6242Y								
2 x 1.5	2	0.7	0.9	4.5 x 8.3	5.4x10.0	1.0	1	0.011
2 x 2.5	2	0.8	1.0	5.2 x 9.8	6.3 x11.9	1.5	1	0.010

NOTE: *This table gives alternative conductor versions (Class **2** conductors) of certain sizes of the cables given in Table **4.***

Table 6-Ordinary duty low temperature PVC insulated and PVC sheathed flexible cable, flat twin 3192A, circular 2 Core 3182A, 3-core 3183A, 4-core 3184A and 5-core 3185A, 300/500V

Construction:

- Conductors: annealed copper, Class **5**;
- Insulation: compound Type **T1 4**;
- Sheath: compound Type **10**

A centre filler of suitable material may be used except for twin cables. For circular cables, the cores and fillers, if any, shall be twisted together to give a practically circular cross- section. For flat cables, the cores shall be laid parallel. A separator may be used that shall not adhere to the cores.
The sheath may fill the outer interstices thus forming a filling but it shall not adhere to the cores.

Core identification and sequence:

- Twin: blue and brown;
- 3-core: green-and -yellow, blue and brown;
- 4-core: green -and yellow, brown, black, grey or green-and -yellow, blue, brown, black*;
- 5-core:green-and-yellow, blue, brown, black, grey.
- Colour of sheath: Yellow or blue.

Number and Nominal Cross sectional area of conductors, **mm^2**	**Radial thickness of insulation,** **mm**	**Radial thickness of sheath,** **mm**	**Mean overall diameter**		**Minimum insulation resistance at 60 °C MΩ-km**
			Lower limit mm	**Upper limit mm**	
(1)	(2)	(3)	(4)	(5)	(6)
3192A					
2 x 0.75	0.6	0.8	3.4×5.7	4.5×7.2	0.011
2 x 1	0.6	0.8	3.6×5.9	4.7×7.5	0.010
3182A					
2 x 0.5	0.6	0.8	5.4	6.8	0.011
2 X 0.75	0.6	0.8	5.7	7.2	0.011
2 X 1	0.6	0.8	5.9	7.5	0.010
2 X 1.5	0.7	0.8	6.8	8.6	0.010
2 X 2.5	0.8	1.0	8.4	10.6	0.0095
2. X 4	0.8	1.1	9.7	12.1	0.0078
3183A					
3 x 0.75	0.6	0.8	6.0	7.6	0.011
3 x 1	0.6	0.8	6.3	8.0	0.010
3 x 1.5	0.7	0.9	7.4	9.4	0.010
3 x 2.5	0.8	1.1	9.2	11.4	0.0095
3 x 4	0.8	1.2	10.5	13.1	0.0078
3184A					
4 X 0.75	0.6	0.8	6.6	8.3	0.011
4 x 1	0.6	0.9	7.1	9.0	0.010
4 x 1.5	0.7	1.0	8.4	10.5	0.010
4 x 2.5	0.8	1.1	10.1	12.5	0.0095
4 x 4	0.8	1.2	11.5	14.3	0.0078
3185A					
5 x 0.75	0.6	0.9	7.4	9.3	0.011
5 x 1	0.6	0.9	7.8	9.8	0.010
5 x 1.5	0.7	1.1	9.3	11.6	0.010
5 x 2.5	0.8	1.2	11.2	13.9	0.0095
5 x 4	0.8	1.4	13.0	16.1	0.0078

*__HD 308__ allows for two alternative core identification methods for 4-core cables with a green-and yellow core

ANNEX A
(Informative)
UK (CMA) REFERENCES

To assist the ongoing Harmonisation scheme, the UK system is slowly being phased out; no codes have been allocated for a number of years. However as many of the old references are so familiar within the industry, it is still useful to list the combinations.

Basically they are composed of four or five figures, followed by alphabetical suffixes, where relevant. The first figure denotes the voltage grade, in four digit codes. In five digit codes, the first two figures indicate its voltage rating. The next two figures describe the construction type and finish; the last figure(s) denote the number of cores. The suffix letter denotes the insulation and, or sheathing material.

1st Figure

0	Special insulation thickness
2	300/300V or 450/750Vflex
3	300/500V or 450/750V flex
6	600/1000V (or 300/500V; 450/750V according to latest edition of BS6004 and BS6007)
61	1900/3300V
85	5000V (for Neon signs)

2nd& 3rd Figures

02	Braided, twisted flexible cords
04	Braided, circular flexible cords
09	Heat Resistant PVC flexible cords
10	Braided, compounded circular cables
12	Lead Alloy sheathed cables
18	Insulated & Sheathed, circular cords and cables
19	Insulated & Sheathed, flat cords and cables
20	Unkinkable domestic belted &braided flexible.
21	Interlocking spiral steel armoured cables
24	Insulated & Sheathed, flat cables, bare earth
26	Insulated & sheathed, steel wire braided& transparent PVC sheathed cables
28	Insulated &Sheathed, Miners Cap Lamp cord
36	Welding cables
49	Insulated, circular cables and flexible cords
57	Insulated &HOFR sheathed ship wiring
58	Insulated, HOFR bedded, SW Braid, HOFR sheathed shipwiring
67	Insulated, Lift control, taped & textile braided cables
70	Insulated, circular flexible cables
77	Insulated, glass braided, treated, single core flexible
78	Insulated, glass braided, treated, twin twisted flexible
79	Insulated, glass braided, treated, multicore circular
80	Insulated, sheathed, copper braid, sheathed, circular
81	Insulated, parallel twin flexible
94	Insulated, sheathed, SWA, sheathed, circular cable

Suffix Letters

A	Cable or flexible cord with taped insulation, also for Arctic Grade
B	OHLS (zero halogen low smoke) insulation
D	Silicone Rubber Insulation
DD	Silicone Rubber Insulation and sheath
E	Polythene Insulation
F	Polythene Insulation and sheath
H	CSP Insulation
P	PCP sheath
Q	CSPHOFR (heat, oil and flame retardant) sheath
T	EPR Insulation
X	PVC Insulation
Y	PVC Insulation and sheath
(AL)	Aluminium conductors
(S)	Shaped conductors
(RP)	Reduced flame propagation
(HR)	Heat resistant
(HD)	Heavy duty

CMA – Cable Manufactures Association.

Table A.1-UK and harmonized CENELEC cording cross references: SLS 733

Location in SLS 733: 2005	**New location**		**UK code**	**CENLEC code**
	Standard	**Clause/Table**		
(1)	**(2)**	**(3)**	**(**4)	**(5)**
Table 4a Table 4b	SLS 1504-2-31 SLS 1504-2-31	4.1/B1 4.2/B2	6491X 6491X	HO7V-U/R HO7V-K
Table 5	SLS 1504-2-31	4.3/B3 4.4/B4	2491X 2491X	HO5V-U/R HO5V-K
Table 7	SLS 733:2016	Table 3	6181Y 6192Y 6193Y	-
Table 8	SLS 733: 2016	Table 4	6241Y 6242Y 6243Y	-
Table 9	SLS 733: 2016	Table 5	6192Y 6241Y 6242Y	-
Table 10a Table 10b	Withdrawn Withdrawn	Withdrawn Withdrawn	- -	HO7V3-U/R HO7V3-K
Table 11a Table 11b	SLS 1504-2-31 SLS 1504-2-31	5.1/B.1 5.2/B.2	6491XHR 6491XHR	HO7V2-U/R HO7V2-K
Table 12	SLS 1504-2-31	5.3/B.3,5.4/B.4	2491XHR	HO5V2-U/R/K
Table 13	SLS 1504-2-51	4.2/B.2	-	HO5VVC4V5-K

Table A.2- UK and harmonized CENELEC coding cross references: SLS 1352

Location in SLS 1352: 2008	**New location**	**UK code**	**CENELEC code**
(1)	(2)	(3)	(4)
Table **26**	Table 6 of **SLS 733 : 2016**	3192A 3182A 3183A 3184A 3185A	-

Annex B
(Informative)
Traditional UK cables transferred to BS EN 50525

Cables that have traditionally been include in British standards, which were also harmonized, have been moved to **BS EN 50525** (all parts).

For clarity and openness during this period of change, the cable types that have the most widespread applications in the United Kingdom have been included in this annex to aid understanding. See Table **B.1** and **B.2**

Construction: Plain copper conductor, PVC insulated only 450/750V,
Traditional UK cable code :6491 X (solid) Harmonized cable code HO7V –U
Traditional UK cable code :6491 X (rigid strand) Harmonized cable code HO7V –R

Nominal Cross sectional area of conductors mm^2	Class of conductor	Radial thickness of insulation Mm	Mean overall diameter		Minimum insulation resistance at 70 °C MΩ km
			Lower limit mm	Upper limit mm	
(1)	(2)	(3)	(4)	(5)	(6)
1.5	1	0.7	2.6	3.2	0.011
1.5	2	0.7	2.7	3.3	0.010
2.5	1	0.8	3.2	3.9	0.010
2.5	2	0.8	3.3	4.0	0.009 9
4	1	0.8	3.6	4.4	0.008 7
4	2	0.8	3.8	4.6	0.008 2
6	1	0.8	4.1	5.0	0.007 4
6	2	0.8	4.3	5.2	0.007 0
10	1	1.0	5.3	6.4	0.007 2
10	2	1.0	5.6	6.7	0.006 7
16	2	1.0	6.4	7.8	0.005 6
25	2	1.2	8.1	9.7	0.005 3
35	2	1.2	9.0	10.9	0.004 6
50	2	1.4	10.6	12.8	0.004 6
70	2	1.4	12.1	14.6	0.004 0
95	2	1.6	14.1	17.1	0.003 9
120	2	1.6	15.6	18.8	0.003 5
150	2	1.8	17.3	20.9	0.003 5
185	2	2.0	19.3	23.3	0.003 5
240	2	2.2	22.0	26.6	0.003 4
300	2	2.4	24.5	29.6	0.003 3
400	2	2.6	27.5	33.2	0.003 1
500	2	2.8	30.5	36.9	0.0030
630	2	2.8	34.0	41.1	0.0027
800	2	2.8	37.8	45.7	0.0024
1000	2	3.0	42.1	51.0	0.0023

NOTE: *The information in this table has been extracted from SLS EN 50525-2-31, Table **B.1***

Table B.1 Standard PVC conduit cable: formerly in SLS 733

Table B.2 Standard PVC flexible cable: formerly in SLS 1143

Construction: Plain copper flexible conductor, PVC insulation, cores laid up, PVC sheath overall, 300/500V

Traditional UK cable code:	Harmonized cable code
• 2 core cable 3182Y	HO5VV-F2
• 3 core cable 3183Y	HO5VV-F3
• 4 core cable 3184Y	HO5VV-F4
• 5 core cable 3185Y	HO5VV-F5

Number and Nominal Cross sectional area of conductors mm^2	**Thickness of insulation: Specified value mm**	**Thickness of sheath : specified value mm**	**Mean overall diameter**		**Minimum insulation resistance at 70 ^{o}C MΩ km**
			Lower limit mm	**Upper limit mm**	
(1)	(2)	(3)	(4)	(5)	(6)
2 x 0.75 2 x 1 2 x 1.5 2 x 2.5 2 x4	0.6 0.6 0.7 0.8 0.8	0.8 0.8 0.8 1.0 1.1	5.7 5.9 6.8 8.4 9.7	7.2 7.5 8.6 10.6 12.1	0.011 0.010 0.010 0.0095 0.0078
3 x 0.75 3 x 1 3 x 1.5 3 x 2.5 3 x 4	0.6 0.6 0.6 0.7 0.8	0.8 0.8 0.9 1.1 1.2	6.0 6.3 7.4 9.2 10.5	7.6 8.0 9.4 11.4 13.1	0.011 0.010 0.010 0.0095 0.0078
4 x 0.75 4 x 1 4 x 1.5 4 x 2.5 4 x 4	0.6 0.6 0.7 0.8 0.8	0.8 0.9 1.0 1.1 1.2	6.6 7.1 8.4 10.1 11.5	8.3 9.0 10.5 12.5 14.3	0.011 0.010 0.010 0.0095 0.0078
5 x 0.75 5 x 1 5 x 1.5 5 x 2.5 5 x 4	0.6 0.6 0.7 0.8 0.8	0.9 0.9 1.1 1.2 1.4	7.4 7.8 9.3 11.2 13.0	9.3 9.8 11.6 13.9 16.1	0.011 0.010 0.010 0.0095 0.0078

Note: *The information in this table has been extracted from SLS EN 50525-2-11, Table **B.2***

ANNEX C
(Informative)
GUIDE TO USE

None of the cable type specified in this standard are intended to be laid underground.

NOTE 1:

Installation requirements and current ratings are detailed in ***BS 7671*****.**

It is assumed that the design of installations and the specification, purchase and insulation of cables specified in this standard is entrusted to suitably skilled and component people.

Information on the specific cables in this standard given in the form of limiting values (see Table **C.1** and Table **C.2**) and is illustrated by examples (see Table **C.3**), which are not exhaustive but which indicate ways by which safety can be obtained.

NOTE 2:

BS 7540-1 *gives general guidance for use of cables.*

It is not practicable to include here all possible methods of installation that installers or users might adopt. If methods are adopted that are not recommended, then this could result in a reduction of safety and life expectancy of the cable. If a cable is intended to be used outside the recommended use, the cable manufacturer should be consulted for advice.

Commentary on Annex C

This annex gives details on general technical guidance and is not intended as an interpretation of any Sri Lanka statutory requirements, where these apply.

Table C.1 Construction details, method of installation and temperature for Table 3 to Table 5

Parameter	Unit	Table 3			Table 4			Table 5	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		6181Y * 6192Y 6193Y	6181Y *	6192Y* 6193Y	6241Y *	6242Y * 6243Y	6242Y * 6243Y	6141Y *	6192Y * 6242Y
Constructional details:									
Nominal voltage rating	V	300/500	300/500	300/500	300/500	300/500	300/500	300/500	300/500
Conductor class **		1	2	2	1	1	2	2	2
Number of cores		1 to 3	1	2 to 3	1	2 to 3	2 to 3	1	2
Cross-sectional area size range	mm^2	1.0 to 2.5	4 to 35	4 to 16	1 to 1.5	1 to 2.5	4 to 16	1.5	1.5 to 2.5
Method of installation: ***									
In conduit		+	+	+	+	+	+	+	+
In cable trunking		+	+	+	+	+	+	+	+
In cable ducting		+	+	+	+	+	+	+	+
Clipped direct		+	+	+	+	+	+	+	+
On cable tray		+	+	+	+	+	+	+	+
Embedded		+	+	+	+	+	+	+	+
Temperature:									
Maximum continuous conductor operating #	°C	70	70	70	70	70	70	70	70
Maximum conductor short circuit (Maximum allowable time 5 s)	°C	160	160	160	160	160	160	160	160
Maximum overload (Maximum available time 4 h)	°C	115	115	115	115	115	115	115	115
Maximum cable surface ##	°C	70	70	70	70	70	70	70	70
Maximum storage	°C	40	40	40	40	40	40	40	40
Minimum insulation and handling	°C	5	5	5	5	5	5	5	5

NOTE: *For the relevant parameter "+" indicates acceptable practice.*

* *These are cable codes.*

** *Conductor class designations:*

1 = solid wire;

2 = stranded (rigid).

*** *The presence of water in contact with the cable is not acceptable.*

\# *The maximum conductor temperature at which the particular cable should operate depends on the limiting temperature of the other cables and accessories with which it is in contact.*

See BS 7540-1

Table C2 Construction details, method of installation and temperature for Table 6

Parameter	Unit	Table 6		
(1)	(2)	(3)		
		3182A*	3183A* 3184A 3185A	3192A*
Construction details:				
Nominal voltage rating	V	300/500	300/500	300/500
Conductor class **		5	5	5
Number of cores		2	3 to 5	2
Cross-sectional area size range	mm ^{2}	0.5$^{\#}$ to 4	0.75 to 4	0.75 to 1.0
Duty:$^{\#\#}$				
Extra light		+	+	+
Light		+	+	+
Ordinary		+	+	+
Heavy		-	-	-
Presence of water				
Condition AD1		+	+	+
Condition AD2		+	+	+
Condition AD6		-	-	-
Condition AD7		-	-	-
Condition AD8		-	-	-
Corrosive or polluting substances condition AF3		-	-	-
Impact condition AG2		-	-	-
Vibrations condition AH3		-	-	-
Flora condition AN2		-	-	-
Fauna condition AL2		-	-	-
Solar radiation condition AN2		-	-	-
Outdoor use:				
Intermittent and temporary periods of short duration		+	+	+
permanent		-	-	-
Flexing and torsion:				
Frequent flexing $^{\#\#}$		+	+	+
Frequent torsion $^{\#\#}$		+	+	-
Temperature:				
Maximum continuous conductor operating ***	°C	60	60	60
Maximum conductor short circuit	°C	160	160	160
(Maximum allowable time 5 s)				
Maximum cable surface	°C	50	50	50
Maximum storage	°C	40	40	40
Minimum installation and handling	°C	-25	-25	-25

NOTE: For the relevant parameter "+" indicates acceptable practice and "-" indicates not acceptable practice.

* These are cable codes.

** Conductor class designations: 5 = flexible.

Cables with cross-sectional area of 0.5 mm ^{2} should be used in lengths not exceeding 2 m and their current should not exceed 3A.

See **BS 7540-1**

***The maximum conductor temperature at which the particular cable should operate depends on the limiting temperature of the other cables and accessories with which it is in contact.

Table C.3 Guide to use

Table	Cable type	Recommendations for use	Comments
(1)	(2)	(3)	(4)
3, 4 and 5	Single core, flat twin and 3-core, PVC sheathed, with and without protective conductor	These cables are suitable for fixed installation in industrial, commercial and domestic premises, installation in walls, on boards, in conduits, trunking or embedded in plaster.	-------
6	Ordinary duty low temperature PVC sheathed circular flexible cable.	The cables are suitable for use on ELV systems (110 V centre tapped) on building sites, use with temporary traffic light systems when suitably protected, indoor use at low voltage (230 V) The cables are not suitable for outdoor use at voltages greater than 110 V ELV.	Usage on buildings sites, with ELV (110 V centre tapped) might include hand-held tools. Yellow sheath for ELV and site services, etc. Blue sheath for temporary traffic lights, etc.

ANNEX D
(Normative)

COMPATIBILITY TEST

D.1 Principle

This test determines whether the insulation and sheath are likely to deteriorate due to contact with the other components in the cables.

D.2 Procedure

D.2.1 Prepare a test sample by ageing it in an air oven in accordance with **Clause 4.2.3.4** of **SLS IEC 60811-401**, for 7 days at $(80\pm2)^0$C. Place a sheet of clean white blotting paper under each test sample in the oven during the ageing to detect any exudation that might drip from the cable.

D.2.2 After completion of the ageing test, the tensile strength and elongation at break for the insulation and sheath shall confirm to the requirements stated in Table **D.1** when measured in accordance with **SLS IEC60811-501**.

Table D.1 Compatibility requirements

Component	**Parameter**	**Requirement for material type**			
		TI 1	**TI 4**	**Type 6**	**Type 10**
(1)	(2)	(3)	(4)	(5)	(6)
Insulation	Minimum tensile strength (N/mm ^{2})	12.5	12.5	-	-
	Minimum percentage elongation at break	125	125	-	-
	Maximum percentage variation * of tensile strength	±20	±20	-	-
	Maximum percentage variation * of elongation at break	±20	±20	-	-
Sheath	Minimum tensile strength (N/mm ^{2})	-	-	6.0	10.0
	Minimum percentage elongation at break	-	-	125	150
	Maximum percentage variation * of tensile strength	-	-	±20	±20
	Maximum percentage variation * of elongation at break	-	-	±20	±20
* The variation is the difference between the respective values obtained prior to after heat treatment, expressed as a percentage of the former					

ANNEX E
(Normative)
METHOD OF TEST FOR VOLTAGE WITHSTAND

E.1 Sample

E.1.1 Sample of completed cable, not less than 20 m long.

E.2 Procedure

Immerse the sample in water at a temperature of (20±5) °C for a period of not less than 24 h. Ensure that the end of the cable protrude above the water by a distance sufficient to prevent excessive surface leakage when the test voltage is applied between the conductor and the water.

Take:

a) each conductor in turn;
b) all other conductors, which are connected together and also connected to the water.

Gradually apply a test voltage of 2000 V between a) and b) and maintain at full r.m.s. value for 15 min.
Repeat the test, but applying the voltage between all conductors connected together and the water.

In both cases earth the circuit protective conductor if present but do not include it in the conductor to be tested. While the sample is still immersed, disconnect the circuit protective conductors from the water and apply a voltage of 1000 V a.c. for 5 min between this and the water.

ANNEX F
(Normative)
TYPE TESTS

F.1 General

Type test, after they have been completed need not be repeated unless changes have been made that might affect conformity to the test requirements. Type tests should not normally be required on cables for any individual contracts provided that such Type tests have already been successfully performed by the manufacturer.

Sub clauses **F.2, F.3 and F.4** give guidance as to the amount of Type testing that might reasonably be required.

F.2 Sample selection for type tests

For Type test on finished cable in Table **3** to Table **5,** conformity can be confirmed by selecting one cable with the smallest conductor size and smallest number of cores, and one cable with the largest conductor size and largest number of cores. To cover the full range of Table **3** to Table **5**; a 1 core 1 mm^2 cable from Table **3**, and 3 core 16 mm^2cable from Table **4** should be selected. If a smaller range is required, then the previous principle for selection should be applied.

For Type tests on finished cable in Table **6**, conformity can be confirmed by selecting one cable with the smallest conductor size and smallest number of cores, and one cable with the largest conductor size and largest number of cores.

In addition, where manufacturers want to demonstrate conformity to this standard, the cable sample should be subject to full dimensional check and to all other sample(S) and routine(R) tests in accordance with Table **2**.

F.3 *Type tests*

F.3.1 *Insulation material (see 7.1)*

One test should be performed for each grade of insulation material on any one cable from the range of cables selected.

F.3.2 *Sheath material (see 10.1)*

One test should be performed for each grade of sheath material on any one cable from the range of cables selected.

F.3.3 *Insulation resistance (see 16.2)*

One test should be performed on each size of cable selected.

F.3.4 *Long term resistance to d.c. (see 16.4)*

One test should be performed on each size of cable selected.

F.3.5 *Compatibility test (see 16.5)*

One test should be performed on each size of cable selected.

F.3.6 *Flame propagation on single cable (see 16.6)*

One test should be performed on each size of cable selected.

F.3.7 ***Length of lay (see 15.5)***

One test should be performed on each size of cable selected.

NOTE: *This test is classified as a sample test. The guidance given below applies to type testing.*

F.3.8 ***Flexing test (see 16.7)***

One test should be performed on each size of cable selected.

F.4 *Change of material*

The tests referred to in **F.3** assume that the materials are consistent throughout the range of cables for which conformity is to be confirmed. Where a change occurs, additional testing should be performed to ensure that such changes are adequately examined.

F.5 Evidence of type testing

When evidence of type testing is required, this should be stated at the enquiry stage. Due to the possible variations in cable designs, it should not be assumed that full type test information is available for the size and type of cable of a particular enquiry.

A certificate of type test signed by the representative of a competent witnessing body, or a properly authorized report by the manufacturer giving the test results, should be acceptable.

SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI *which includes surveillance inspection of the factory, testing of both factory and market samples.*

Further particulars of the terms and conditions of the permit may be obtained from the Sri *Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.*

Printed at SLSI (Printing Unit)

SRI LANKA STANDARDS INSTITUTION

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Science, Technology and Research.

The Principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote Standardization and quality control by educational, consultancy and research and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and Administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in return are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution Endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of Standardization as are of special interest to Sri Lanka.

Printed at the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08