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**Conducteurs et câbles isolés au polychlorure
de vinyle, de tension nominale au plus égale
à 450/750 V –**

**Partie 3:
Conducteurs pour installations fixes**

**Polyvinyl chloride insulated cables
of rated voltages up to and including
450/750 V –**

**Part 3:
Non-sheathed cables for fixed wiring**

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Terminologie, symboles graphiques et littéraux

En ce qui concerne la terminologie générale, le lecteur se reportera à la CEI 60050: *Vocabulaire Electrotechnique International* (VEI).

Pour les symboles graphiques, les symboles littéraux et les signes d'usage général approuvés par la CEI, le lecteur consultera la CEI 60027: *Symboles littéraux à utiliser en électrotechnique*, la CEI 60417: *Symboles graphiques utilisables sur le matériel. Index, relevé et compilation des feuilles individuelles*, et la CEI 60617: *Symboles graphiques pour schémas*.

Publications de la CEI établies par le même comité d'études

L'attention du lecteur est attirée sur les listes figurant à la fin de cette publication, qui énumèrent les publications de la CEI préparées par le comité d'études qui a établi la présente publication.

* Voir adresse «site web» sur la page de titre.

Numbering

As from the 1st January 1997 all IEC publications are issued with a designation in the 60000 series.

Consolidated publications

Consolidated versions of some IEC publications including amendments are available. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Validity of this publication

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology.

Information relating to the date of the reconfirmation of the publication is available in the IEC catalogue.

Information on the revision work, the issue of revised editions and amendments may be obtained from IEC National Committees and from the following IEC sources:

- **IEC Bulletin**
- **IEC Yearbook**
On-line access*
- **Catalogue of IEC publications**
Published yearly with regular updates (On-line access)*

Terminology, graphical and letter symbols

For general terminology, readers are referred to IEC 60050: *International Electrotechnical Vocabulary* (IEV).

For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams*.

IEC publications prepared by the same technical committee

The attention of readers is drawn to the end pages of this publication which list the IEC publications issued by the technical committee which has prepared the present publication.

* See web site address on title page.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

POLYVINYL CHLORIDE INSULATED CABLES
OF RATED VOLTAGES UP TO AND
INCLUDING 450/750 V

Part 3: Non-sheathed cables for fixed wiring

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
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This part of International Standard IEC 227 has been prepared by sub-committee 20B: Low-voltage cables, of IEC technical committee 20: Electric cables.

This second edition cancels and replaces the first edition published in 1979 and constitutes a technical revision.

The text of this standard is based on that of the first edition and on the following documents:

Six Months' Rule	Report on Voting
20B(CO)115	20B(CO)124

Full information on the voting for the approval of this part can be found in the report on voting indicated in the above table.

IEC 227 consists of the following parts, under the general title: Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V:

Part 1: General requirements

Part 2: Test methods

Part 3: Non-sheathed cables for fixed wiring

Part 4: Sheathed cables for fixed wiring

Part 5: Flexible cables (cords)

Part 6: Lift cables and cables for flexible connections.

This part, in conjunction with parts 1 and 2, forms the complete standard for non-sheathed cables for fixed wiring.

POLYVINYL CHLORIDE INSULATED CABLES
OF RATED VOLTAGES UP TO AND
INCLUDING 450/750 V

Part 3: Non-sheathed cables for fixed wiring

1 General

1.1 Scope

This part of IEC 227 details the particular specifications for polyvinyl chloride insulated single-core non-sheathed cables for fixed wiring of rated voltages up to and including 450/750 V.

All cables shall comply with the appropriate requirements given in IEC 227-1 and the individual types of cables shall each comply with the particular requirements of this part.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 227. At the time of publication, the editions indicated were valid. All normative documents are subject to revision and parties to agreements based on this part of IEC 227 are encouraged to investigate the possibility of applying the most recent editions of the normative documents listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 227-1: 1993, *Polyvinyl chloride insulated cables of rated voltage up to and including 450/750 V – Part 1: General requirements*

IEC 227-2: 1979, *Polyvinyl chloride insulated cables of rated voltage up to and including 450/750 V – Part 2: Test methods*

IEC 228: 1978, *Conductors of insulated cables*

IEC 332-1: 1979, *Tests on electric cables under fire conditions – Part 1: Test on a single vertical insulated wire or cable*

IEC 811-1-1: 1985, *Common test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section One: Measurement of thickness and overall dimensions – Tests for determining the mechanical properties*

Amendment 1 (1988). Amendment 2 (1989).

IEC 811-1-2: 1985, *Common test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section Two: Thermal ageing methods*

Amendment 1 (1989).

IEC 811-1-4: 1985, *Common test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section Four: Tests at low temperature*

IEC 811-3-1: 1985, *Common test methods for insulating and sheathing materials of electric cables – Part 3: Methods specific to PVC compounds – Section One: Pressure test at high temperature – Tests for resistance to cracking*

IEC 811-3-2: 1985, *Common test methods for insulating and sheathing materials of electric cables – Part 3: Methods specific to PVC compounds – Section Two: Loss of mass test – Thermal stability tests*

2 Single-core non-sheathed cable with rigid conductor for general purposes

2.1 Code designation

227 IEC 01.

2.2 Rated voltage

450/750 V.

2.3 Construction

2.3.1 Conductor

Number of conductors: 1.

The conductors shall comply with the requirements of IEC 228:

- class 1 for solid conductors;
- class 2 for stranded conductors.

2.3.2 Insulation

The insulation shall be polyvinyl chloride compound of Type PVC/C applied around the conductor.

The insulation thickness shall comply with the specified value given in column 3 of table 1.

The insulation resistance shall be not less than the values given in column 5 of table 1.

2.3.3 Overall diameter

The mean overall diameter shall not exceed the upper limit given in column 4 of table 1.

Table 1 – General data for type 227 IEC 01

1	2	3	4	5
Nominal cross-sectional area of conductors mm ²	Class of conductor IEC 228	Thickness of insulation Specified value mm	Mean overall diameter Upper limit mm	Minimum insulation resistance at 70 °C MΩ · km
1,5	1	0,7	3,3	0,011
1,5	2	0,7	3,4	0,010
2,5	1	0,8	3,9	0,010
2,5	2	0,8	4,2	0,009
4	1	0,8	4,4	0,0085
4	2	0,8	4,8	0,0077
6	1	0,8	4,9	0,0070
6	2	0,8	5,4	0,0065
10	1	1,0	6,4	0,0070
10	2	1,0	6,8	0,0065
16	2	1,0	8,0	0,0050
25	2	1,2	9,8	0,0050
35	2	1,2	11,0	0,0040
50	2	1,4	13,0	0,0045
70	2	1,4	15,0	0,0035
95	2	1,6	17,0	0,0035
120	2	1,6	19,0	0,0032
150	2	1,8	21,0	0,0032
185	2	2,0	23,5	0,0032
240	2	2,2	26,5	0,0032
300	2	2,4	29,5	0,0030
400	2	2,6	33,5	0,0028

2.4 Tests

Compliance with the requirements of 2.3 above shall be checked by inspection and by the tests given in table 2.

2.5 Guide to use

Maximum conductor temperature in normal use: 70 °C.

NOTE – Other guidelines are under consideration.

Table 2 – Tests for type 227 IEC 01

1	2	3	4	
Ref. No.	Test	Category of test	Test method described in IEC	Subclause
1	<i>Electric tests</i>			
1.1	Resistance of conductors	T, S	227-2	2.1
1.2	Voltage test at 2 500 V	T, S	227-2	2.2
1.3	Insulation resistance at 70 °C	T	227-2	2.4
2	<i>Provisions covering constructional and dimensional characteristics</i>		227-1 et 227-2	
2.1	Checking of compliance with constructional provisions	T, S	227-1	Inspection and manual tests
2.2	Measurement of insulation thickness	T, S	227-2	1.9
2.3	Measurement of overall diameter	T, S	227-2	1.11
3	<i>Mechanical properties of insulation</i>			
3.1	Tensile test before ageing	T	811-1-1	9.1
3.2	Tensile test after ageing	T	811-1-2	8.1.3.1
3.3	Loss of mass test	T	811-3-2	8.1
4	<i>Pressure test at high temperature</i>	T	811-3-1	8.1
5	<i>Elasticity and impact strength at low temperature</i>			
5.1	Bending test for insulation	T	811-1-4	8.1
5.2	Elongation test for insulation ¹⁾	T	811-1-4	8.3
5.3	Impact test for insulation	T	811-1-4	8.5
6	<i>Heat shock test</i>	T	811-3-1	9.1
7	<i>Test of flame retardance</i>	T	332-1	

¹⁾ Only applicable if the overall diameter of the cable exceeds the limit specified in the test method.

3 Single-core non-sheathed cable with flexible conductor for general purposes

3.1 Code designation

227 IEC 02.

3.2 Rated voltage

450/750 V.

3.3 Construction

3.3.1 Conductor

Number of conductors: 1.

The conductors shall comply with the requirements given in IEC 228 for class 5 conductors.

3.3.2 Insulation

The insulation shall be polyvinyl chloride compounds of type PVC/C, applied around the conductor.

The insulation thickness shall comply with the specified value given in column 2 of table 3.

The insulation resistance shall be not less than the value given in column 4 of table 3.

Table 3 – General data for type 227 IEC 02

1	2	3	4
Nominal cross-sectional area of conductors mm ²	Insulation thickness Specified value mm	Mean overall diameter Upper limit mm	Minimum insulation resistance at 70 °C MΩ · km
1,5	0,7	3,5	0,010
2,5	0,8	4,2	0,009
4	0,8	4,8	0,007
6	0,8	6,3	0,006
10	1,0	7,6	0,0056
16	1,0	8,8	0,0046
25	1,2	11,0	0,0044
35	1,2	12,5	0,0038
50	1,4	14,5	0,0037
70	1,4	17,0	0,0032
95	1,6	19,0	0,0032
120	1,6	21,0	0,0029
150	1,8	23,5	0,0029
185	2,0	26,0	0,0029
240	2,2	29,5	0,0028

3.3.3 Overall diameter

The mean overall diameter shall not exceed the upper limit given in column 3 of table 3.

3.4 Tests

Compliance with the requirements of 3.3 shall be checked by inspection and by the tests given in table 4.

3.5 Guide to use

Maximum conductor temperature in normal use: 70 °C.

NOTE – Other guidelines are under consideration.

Table 4 – Tests for type 227 IEC 02

1 Ref. No.	2 Test	3 Category of test	4 Test method described in:	
			IEC	Subclause
1	<i>Electric tests</i>			
1.1	Resistance of conductors	T, S	227-2	2.1
1.2	Voltage test at 2 500 V	T, S	227-2	2.2
1.3	Insulation resistance at 70 °C	T	227-2	2.4
2	<i>Provisions covering constructional and dimensional characteristics</i>		227-1 et 227-2	
2.1	Checking of compliance with constructional provisions	T, S	227-1	Inspection and manual tests
2.2	Measurement of insulation thickness	T, S	227-2	1.9
2.3	Measurement of overall diameter	T, S	227-2	1.11
3	<i>Mechanical properties of insulation</i>			
3.1	Tensile test before ageing	T	811-1-1	9.1
3.2	Tensile test after ageing	T	811-1-2	8.1.3.1
3.3	Loss of mass test	T	811-3-2	8.1
4	<i>Pressure test at high temperature</i>	T	811-3-1	8.1
5	<i>Elasticity at low temperature</i>			
5.1	Bending test for insulation	T	811-1-4	8.1
5.2	Elongation test for insulation ¹⁾	T	811-1-4	8.3
6	<i>Heat shock test</i>	T	811-3-1	9.1
7	<i>Test of flame retardance</i>	T	332-1	

¹⁾ Only applicable if the overall diameter of the cable exceeds the limit specified in the test method.

4 Single-core non-sheathed cable with solid conductor for internal wiring for a conductor temperature of 70 °C

4.1 Code designation

227 IEC 05.

4.2 Rated voltage

300/500 V.

4.3 Construction

4.3.1 Conductor

Number of conductors: 1.

The conductors shall comply with the requirements given in IEC 228 for class 1 conductors.

4.3.2 Insulation

The insulation shall be polyvinyl chloride compound of type PVC/C, applied around the conductor.

The insulation thickness shall comply with the specified value given in column 2 of table 5.

The insulation resistance shall be not less than the value given in column 4 of table 5.

4.3.3 Overall diameter

The mean overall diameter shall not exceed the upper limit given in column 3 of table 5.

Table 5 – General data for type 227 IEC 05

1	2	3	4
Nominal cross-sectional area of conductors mm ²	Insulation thickness Specified value mm	Mean overall diameter Upper limit mm	Minimum insulation resistance at 70 °C MΩ · km
0,5	0,6	2,4	0,015
0,75	0,6	2,6	0,012
1	0,6	2,8	0,011

4.4 Tests

Compliance with the requirements of 4.3 shall be checked by inspection and by the tests given in table 6.

4.5 Guide to use

Maximum conductor temperature in normal use: 70 °C.

NOTE - Other guidelines are under consideration

Table 6 - Tests for type 227 IEC 05

1	2	3	4	
Ref. No.	Test	Category of test	Test described in	
			IEC	Subclause
1	<i>Electric tests</i>			
1.1	Resistance of conductors	T, S	227-2	2.1
1.2	Voltage test at 2 000 V	T, S	227-2	2.2
1.3	Insulation resistance at 70 °C	T	227-2	2.4
2	<i>Provisions covering constructional and dimensional characteristics</i>		227-1 et 227-2	
2.1	Checking of compliance with constructional provisions	T, S	227-1	Inspection and manual tests
2.2	Measurement of insulation thickness	T, S	227-2	1.9
2.3	Measurement of overall diameter	T, S	227-2	1.11
3	<i>Mechanical properties of insulation</i>			
3.1	Tensile test before ageing	T	811-1-1	9.1
3.2	Tensile test after ageing	T	811-1-2	8.1.3.1
3.3	Loss of mass test	T	811-3-2	8.1
4	<i>Pressure test at high temperature</i>	T	811-3-1	8.1
5	<i>Elasticity at low temperature</i>			
5.1	Bending test for insulation	T	811-1-4	8.1
6	<i>Heat shock test</i>	T	811-3-1	9.1
7	<i>Test of flame retardance</i>	T	332-1	

5 Single-core non-sheathed cable with flexible conductor for internal wiring for a conductor temperature of 70 °C

5.1 Code designation

227 IEC 06.

5.2 Rated voltage

300/500 V.

5.3 Construction

5.3.1 Conductor

Number of conductors: 1.

The conductors shall comply with the requirements given in IEC 228 for class 5 conductors.

5.3.2 Insulation

The insulation shall be polyvinyl chloride compound of type PVC/C, applied around the conductor.

The insulation thickness shall comply with the specified values given in column 2 of table 7.

The insulation resistance shall be not less than the value given in column 4 of table 7.

5.3.3 Overall diameter

The mean overall diameter shall not exceed the upper limit given in column 3 of table 7.

Table 7 – General data for type 227 IEC 06

1	2	3	4
Nominal cross-sectional area of conductors mm ²	Insulation thickness Specified value mm	Mean overall diameter Upper limit mm	Minimum insulation resistance at 70 °C MΩ · km
0,5	0,6	2,6	0,013
0,75	0,6	2,8	0,011
1	0,6	3,0	0,010

5.4 Tests

Compliance with the requirements of 5.3 shall be checked by inspection and by the tests given in table 8.

5.5 *Guide to use*

Maximum conductor temperature in normal use: 70 °C.

NOTE – Other guidelines are under consideration.

Table 8 – Tests for type 227 IEC 06

1	2	3	4	
Ref. No.	Test	Category of test	Test method described in IEC	Subclause
1	<i>Electric tests</i>			
1.1	Resistance of conductors	T, S	227-2	2.1
1.2	Voltage test at 2 000 V	T, S	227-2	2.2
1.3	Insulation resistance at 70 °C	T	227-2	2.4
2	<i>Provisions covering constructional and dimensional characteristics</i>		227-1 et 227-2	
2.1	Checking of compliance with constructional provisions	T, S	227-1	Inspection and manual tests
2.2	Measurement of insulation thickness	T, S	227-2	1.9
2.3	Measurement of overall diameter	T, S	227-2	1.11
3	<i>Mechanical properties of insulation</i>			
3.1	Tensile test before ageing	T	811-1-1	9.1
3.2	Tensile test after ageing	T	811-1-2	8.1.3.1
3.3	Loss of mass test	T	811-3-2	8.1
4	<i>Pressure test at high temperature</i>	T	811-3-1	8.1
5	<i>Elasticity at low temperature</i>			
5.1	Bending test for insulation	T	811-1-4	8.1
6	<i>Heat shock test</i>	T	811-3-1	9.1
7	<i>Test of flame retardance</i>	T	332-1	

6 Single-core non-sheathed cable with solid conductor for internal wiring for a conductor temperature of 90 °C

6.1 Code designation

227 IEC 07.

6.2 Rated voltage

300/500 V.

6.3 Construction

6.3.1 Conductor

Number of conductors: 1.

The conductors shall comply with the requirements given in IEC 228 for class 1 conductors.

6.3.2 Insulation

The insulation shall be polyvinyl chloride compound of type PVC/E, applied around the conductor.

The insulation thickness shall comply with the specified value given in column 2 of table 9.

The insulation resistance shall be not less than the value given in column 4 of table 9.

6.3.3 Overall diameter

The mean overall diameter shall not exceed the upper limit given in column 3 of table 9.

Table 9 – General data for type 227 IEC 07

1	2	3	4
Nominal cross-sectional area of conductors mm ²	Insulation thickness Specified value mm	Mean overall diameter Upper limit mm	Minimum insulation resistance at 90 °C MΩ · km
0,5	0,6	2,4	0,015
0,75	0,6	2,6	0,013
1	0,6	2,8	0,012
1,5	0,7	3,3	0,011
2,5	0,8	3,9	0,009

6.4 Tests

Compliance with the requirements of 6.3 shall be checked by inspection and by the tests given in table 10.

6.5 Guide to use

Maximum conductor temperature in normal use: 90 °C.

In circumstances in which it is possible to guard against thermoplastic flow, and reduced insulation resistance can be tolerated, PVC compound suitable for continuous use at 90 °C can be operated at temperatures up to 105 °C for a reduced total working duration.

NOTE – Other guidelines are under consideration.

Table 10 – Tests for type 227 IEC 07

1	2	3	4	
Ref. No.	Test	Category of test	Test method described in IEC	Subclause
1	<i>Electric tests</i>			
1.1	Resistance of conductors	T, S	227-2	2.1
1.2	Voltage test at 2 000 V	T, S	227-2	2.2
1.3	Insulation resistance at 90 °C	T	227-2	2.4
2	<i>Provisions covering constructional and dimensional characteristics</i>		227-1 et 227-2	
2.1	Checking of compliance with constructional provisions	T, S	227-1	Inspection and manual tests
2.2	Measurement of insulation thickness	T, S	227-2	1.9
2.3	Measurement of overall diameter	T, S	227-2	1.11
3	<i>Mechanical properties of insulation</i>			
3.1	Tensile test before ageing	T	811-1-1	9.1
3.2	Tensile test after ageing	T	811-1-2	8.1.3.1
3.3	Loss of mass test	T	811-3-2	8.1
4	<i>Pressure test at high temperature</i>	T	811-3-1	8.1
5	<i>Elasticity at low temperature</i>			
5.1	Bending test for insulation	T	811-1-4	8.1
6	<i>Heat shock test</i>	T	811-3-1	9.1
7	<i>Test of flame retardance</i>	T	332-1	
8	<i>Thermal stability</i>	T	811-3-2	9

7 Single-core non-sheathed cable with flexible conductor for internal wiring for a conductor temperature of 90 °C

7.1 Code designation

227 IEC 08.

7.2 Rated voltage

300/500 V.

7.3 Construction

7.3.1 Conductor

Number of conductors: 1.

The conductors shall comply with the requirements given in IEC 228 for class 5 conductors.

7.3.2 Insulation

The insulation shall be polyvinyl chloride compound of type PVC/E, applied around the conductor.

The insulation thickness shall comply with the specified value given in column 2 of table 11.

The insulation resistance shall be not less than the value given in column 4 of table 11.

7.3.3 Overall diameter

The mean overall diameter shall not exceed the upper limit given in column 3 of table 11.

Table 11 – General data for type 227 IEC 08

1	2	3	4
Nominal cross-sectional area of conductors mm ²	Insulation thickness Specified value mm	Mean overall diameter Upper limit mm	Minimum insulation resistance at 90 °C MΩ · km
0,5	0,6	2,6	0,013
0,75	0,6	2,8	0,012
1	0,6	3,0	0,010
1,5	0,7	3,5	0,009
2,5	0,8	4,2	0,009

7.4 Tests

Compliance with the requirements of 7.3 shall be checked by inspection and by the test given in table 12.

7.5 Guide to use

Maximum conductor temperature in normal use: 90 °C.

In circumstances in which it is possible to guard against thermoplastic flow, and reduced insulation resistance can be tolerated, PVC compound suitable for continuous use at 90 °C can be operated at temperatures up to 105 °C for a reduced total working duration.

NOTE – Other guidelines are under consideration.

Table 12 – Tests for type 227 IEC 08

1	2	3	4	
Ref. No.	Test	Category of test	Test method described in IEC	Subclause
1	<i>Electric tests</i>			
1.1	Resistance of conductors	T, S	227-2	2.1
1.2	Voltage test at 2 000 V	T, S	227-2	2.2
1.3	Insulation resistance at 90 °C	T	227-2	2.4
2	<i>Provisions covering constructional and dimensional characteristics</i>		227-1 et 227-2	
2.1	Checking of compliance with constructional provisions	T, S	227-1	Inspection and manual tests
2.2	Measurement of insulation thickness	T, S	227-2	1.9
2.3	Measurement of overall diameter	T, S	227-2	1.11
3	<i>Mechanical properties of insulation</i>			
3.1	Tensile test before ageing	T	811-1-1	9.1
3.2	Tensile test after ageing	T	811-1-2	8.1.3.1
3.3	Loss of mass test	T	811-3-2	8.1
4	<i>Pressure test at high temperature</i>	T	811-3-1	8.1
5	<i>Elasticity at low temperature</i>			
5.1	Bending test for insulation	T	811-1-4	8.1
6	<i>Heat shock test</i>	T	811-3-1	9.1
7	<i>Test of flame retardance</i>	T	332-1	
8	<i>Thermal stability</i>	T	811-3-2	9

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60227-3

1993

AMENDEMENT 1
AMENDMENT 1

1997-07

Amendement 1

**Conducteurs et câbles isolés au polychlorure
de vinyle, de tension nominale au plus égale
à 450/750 V**

**Partie 3:
Conducteurs pour installations fixes**

Amendment 1

**Polyvinyl chloride insulated cables
of rated voltages up to and including
450/750 V**

**Part 3:
Non-sheathed cables for fixed wiring**

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Table 3 – General data for type 227 IEC 02

*Replace the existing table 3 by the following new table 3:***Table 3 – General data for type 227 IEC 02**

1	2	3	4	5
Nominal cross-sectional area of conductor mm ²	Thickness of insulation Specified value mm	Mean overall diameter		Minimum insulation resistance at 70 °C MΩ·km
		Lower limit mm	Upper limit mm	
1,5	0,7	2,8	3,4	0,010
2,5	0,8	3,4	4,1	0,009
4	0,8	3,9	4,8	0,007
6	0,8	4,4	5,3	0,006
10	1,0	5,7	6,8	0,0056
16	1,0	6,7	8,1	0,0046
25	1,2	8,4	10,2	0,0044
35	1,2	9,7	11,7	0,0038
50	1,4	11,5	13,9	0,0037
70	1,4	13,2	16,0	0,0032
95	1,6	15,1	18,2	0,0032
120	1,6	16,7	20,2	0,0029
150	1,8	18,6	22,5	0,0029
185	2,0	20,6	24,9	0,0029
240	2,2	23,5	28,4	0,0028

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Table 5 – General data for type 227 IEC 05

*Replace the existing table 5 by the following new table 5:***Table 5 – General data for type 227 IEC 05**

1	2	3	4	5
Nominal cross-sectional area of conductor mm ²	Thickness of insulation Specified value mm	Mean overall diameter		Minimum insulation resistance at 70 °C MΩ·km
		Lower limit mm	Upper limit mm	
0,5	0,6	1,9	2,3	0,015
0,75	0,6	2,1	2,5	0,012
1	0,6	2,2	2,7	0,011

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Table 7 – General data for type 227 IEC 06

*Replace the existing table 7 by the following new table 7:***Table 7 – General data for type 227 IEC 06**

1	2	3	4	5
Nominal cross-sectional area of conductor mm ²	Thickness of insulation Specified value mm	Mean overall diameter		Minimum insulation resistance at 70 °C MΩ·km
		Lower limit mm	Upper limit mm	
0,5	0,6	2,1	2,5	0,013
0,75	0,6	2,2	2,7	0,011
1	0,6	2,4	2,8	0,010

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Table 9 – General data for type 227 IEC 07

*Replace the existing table 9 by the following new table 9:***Table 9 – General data for type 227 IEC 07**

1	2	3	4	5
Nominal cross-sectional area of conductor mm ²	Thickness of insulation Specified value mm	Mean overall diameter		Minimum insulation resistance at 70 °C MΩ·km
		Lower limit mm	Upper limit mm	
0,5	0,6	1,9	2,3	0,015
0,75	0,6	2,1	2,5	0,013
1	0,6	2,2	2,7	0,012
1,5	0,7	2,6	3,2	0,011
2,5	0,8	3,2	3,9	0,009

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Table 11 – General data for type 227 IEC 08

*Replace the existing table 11 by the following new table 11:***Table 11 – General data for type 227 IEC 08**

1	2	3	4	5
Nominal cross-sectional area of conductor mm ²	Thickness of insulation Specified value mm	Mean overall diameter		Minimum insulation resistance at 90 °C MΩ·km
		Lower limit mm	Upper limit mm	
0,5	0,6	2,1	2,5	0,013
0,75	0,6	2,2	2,7	0,012
1	0,6	2,4	2,8	0,010
1,5	0,7	2,8	3,4	0,009
2,5	0,8	3,4	4,1	0,009

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Deuxième édition
Second edition
1993-02

**Conducteurs et câbles isolés au polychlorure
de vinyle, de tension nominale au plus égale
à 450/750 V**

Partie 3:
Conducteurs pour installations fixes

**Polyvinyl chloride insulated cables
of rated voltages up to and including
450/750 V**

Part 3:
Non-sheathed cables for fixed wiring

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**POLYVINYL CHLORIDE INSULATED CABLES
OF RATED VOLTAGES UP TO AND
INCLUDING 450/750 V -****Part 3: Non-sheathed cables for fixed wiring**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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This part of International Standard IEC 60227 has been prepared by sub-committee 20B: Low-voltage cables, of IEC technical committee 20: Electric cables.

This consolidated version of IEC 60227-3 is based on the second edition (1993) [documents 20B(CO)115 and 20B(CO)124] and its amendment 1 (1997) [documents 20B/226/FDIS and 20B/250/RVD].

It bears the edition number 2.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

IEC 60227 consists of the following parts, under the general title: Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V:

Part 1: General requirements

Part 2: Test methods

Part 3: Non-sheathed cables for fixed wiring

Part 4: Sheathed cables for fixed wiring

Part 5: Flexible cables (cords)

Part 6: Lift cables and cables for flexible connections

Part 7: Flexible cables screened and unscreened with two or more conductors.

This part, in conjunction with parts 1 and 2, forms the complete standard for non-sheathed cables for fixed wiring.

**POLYVINYL CHLORIDE INSULATED CABLES
OF RATED VOLTAGES UP TO AND
INCLUDING 450/750 V –**

Part 3: Non-sheathed cables for fixed wiring

1 General

1.1 Scope

This part of IEC 60227 details the particular specifications for polyvinyl chloride insulated single-core non-sheathed cables for fixed wiring of rated voltages up to and including 450/750 V.

All cables shall comply with the appropriate requirements given in IEC 60227-1 and the individual types of cables shall each comply with the particular requirements of this part.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60227. At the time of publication, the editions indicated were valid. All normative documents are subject to revision and parties to agreements based on this part of IEC 60227 are encouraged to investigate the possibility of applying the most recent editions of the normative documents listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60227-1:1993, *Polyvinyl chloride insulated cables of rated voltage up to and including 450/750 V – Part 1: General requirements**

IEC 60227-2:1979, *Polyvinyl chloride insulated cables of rated voltage up to and including 450/750 V – Part 2: Test methods**

IEC 60228:1978, *Conductors of insulated cables*
First supplement 60228A (1982), amendment 1 (1993)

IEC 60332-1:1979, *Tests on electric cables under fire conditions – Part 1: Test on a single vertical insulated wire or cable*

IEC 60811-1-1:1993, *Common test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section One: Measurement of thickness and overall dimensions – Tests for determining the mechanical properties*
Amendment 1 (1988). Amendment 2 (1989)

IEC 60811-1-2:1985, *Common test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section Two: Thermal ageing methods*
Amendment 1 (1989)

IEC 60811-1-4:1985, *Common test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section Four: Tests at low temperature*

* Revised edition to be published.

IEC 60811-3-1:1985, *Common test methods for insulating and sheathing materials of electric cables – Part 3: Methods specific to PVC compounds – Section One: Pressure test at high temperature – Tests for resistance to cracking*

IEC 60811-3-2:1985, *Common test methods for insulating and sheathing materials of electric cables – Part 3: Methods specific to PVC compounds – Section Two: Loss of mass test – Thermal stability tests*

2 Single-core non-sheathed cable with rigid conductor for general purposes

2.1 Code designation

60227 IEC 01.

2.2 Rated voltage

450/750 V.

2.3 Construction

2.3.1 Conductor

Number of conductors: 1.

The conductors shall comply with the requirements of IEC 60228:

- class 1 for solid conductors;
- class 2 for stranded conductors.

2.3.2 Insulation

The insulation shall be polyvinyl chloride compound of Type PVC/C applied around the conductor.

The insulation thickness shall comply with the specified value given in column 3 of table 1.

 a insulation resistance shall be not less than the values given in column 5 of table 1.

2.3.3 Overall diameter

The mean overall diameter shall not exceed the upper limit given in column 4 of table 1.

Table 1 – General data for type 60227 IEC 01

1	2	3	4	5	6
Nominal cross-sectional area of conductor mm ²	Class of conductor IEC 60228	Thickness of insulation Specified value mm	Mean overall diameter		Minimum insulation resistance at 70 °C MΩ·km
			Lower limit mm	Upper limit mm	
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
4	1	0,8	3,6	4,4	0,0085
4	2	0,8	3,8	4,6	0,0077
6	1	0,8	4,1	5,0	0,0070
6	2	0,8	4,3	5,2	0,0065
10	1	1,0	5,3	6,4	0,0070
10	2	1,0	5,6	6,7	0,0065
16	2	1,0	6,4	7,8	0,0050
25	2	1,2	8,1	9,7	0,0050
35	2	1,2	9,0	10,9	0,0043
50	2	1,4	10,6	12,8	0,0043
70	2	1,4	12,1	14,6	0,0035
95	2	1,6	14,1	17,1	0,0035
120	2	1,6	15,6	18,8	0,0032
150	2	1,8	17,3	20,9	0,0032
185	2	2,0	19,3	23,3	0,0032
240	2	2,2	22,0	26,6	0,0032
300	2	2,4	24,5	29,6	0,0030
400	2	2,6	27,5	33,2	0,0028

2.4 Tests

Compliance with the requirements of 2.3 above shall be checked by inspection and by the tests given in table 2.

2.5 Guide to use

Maximum conductor temperature in normal use: 70 °C.

NOTE – Other guidelines are under consideration.

Table 2 – Tests for type 60227 IEC 01

1	2	3	4	
Ref. No.	Test	Category of test	Test method described in IEC	Subclause
1	<i>Electric test</i>			
1.1	Resistance of conductors	T, S	60227-2	2.1
1.2	Voltage test at 2 500 V	T, S	60227-2	2.2
1.3	Insulation resistance at 70 °C	T	60227-2	2.4
2	<i>Provisions covering constructional and dimensional characteristics</i>		60227-1 and 60227-2	
2.1	Checking of compliance with constructional provisions	T, S	60227-1	Inspection and manual tests
2.2	Measurement of insulation thickness	T, S	60227-2	1.9
2.3	Measurement of overall diameter	T, S	60227-2	1.11
3	<i>Mechanical properties of insulation</i>			
3.1	Tensile test before ageing	T	60811-1-1	9.1
3.2	Tensile test after ageing	T	60811-1-2	8.1.3.1
3.3	Loss of mass test	T	60811-3-2	8.1
4	<i>Pressure test at high temperature</i>	T	60811-3-1	8.1
5	<i>Elasticity and impact strength at low temperature</i>			
5.1	Bending test for insulation	T	60811-1-4	8.1
5.2	Elongation test for insulation ¹⁾	T	60811-1-4	8.3
5.3	Impact test for insulation	T	60811-1-4	8.5
6	<i>Heat shock test</i>	T	60811-3-1	9.1
7	<i>Test of flame retardance</i>	T	60332-1	

¹⁾ Only applicable if the overall diameter of the cable exceeds the limits specified in the test method.

3 Single-core non-sheathed cable with flexible conductor for general purposes

3.1 Code designation

60227 IEC 02.

3.2 Rated voltage

450/750 V.

3.3 Construction

3.3.1 Conductor

Number of conductors: 1.

The conductors shall comply with the requirements given in IEC 60228 for class 5 conductors.

3.3.2 Insulation

The insulation shall be polyvinyl chloride compounds of type PVC/C, applied around the conductor.

The insulation thickness shall comply with the specified value given in column 2 of table 3.

The insulation resistance shall be not less than the value given in column 4 of table 3.

Table 3 – General data for type 60227 IEC 02

1	2	3	4	5
Nominal cross-sectional area of conductor mm ²	Thickness of insulation Specified value mm	Mean overall diameter		Minimum insulation resistance at 70 °C MΩ·km
		Lower limit mm	Upper limit mm	
1,5	0,7	2,8	3,4	0,010
2,5	0,8	3,4	4,1	0,009
4	0,8	3,9	4,8	0,007
6	0,8	4,4	5,3	0,006
10	1,0	5,7	6,8	0,0056
16	1,0	6,7	8,1	0,0046
25	1,2	8,4	10,2	0,0044
35	1,2	9,7	11,7	0,0038
50	1,4	11,5	13,9	0,0037
70	1,4	13,2	16,0	0,0032
95	1,6	15,1	18,2	0,0032
120	1,6	16,7	20,2	0,0029
150	1,8	18,6	22,5	0,0029
185	2,0	20,6	24,9	0,0029
240	2,2	23,5	28,4	0,0028

3.3.3 Overall diameter

The mean overall diameter shall not exceed the upper limit given in column 3 of table 3.

3.4 Tests

Compliance with the requirements of 3.3 shall be checked by inspection and by the tests given in table 4.

3.5 Guide to use

Maximum conductor temperature in normal use: 70 °C.

NOTE – Other guidelines are under consideration.

Table 4 – Tests for type 60227 IEC 02

1	2	3	4	
Ref. No.	Test	Category of test	Test method described in IEC	Subclause
1	<i>Electric test</i>			
1.1	Resistance of conductors	T, S	60227-2	2.1
1.2	Voltage test at 2 500 V	T, S	60227-2	2.2
1.3	Insulation resistance at 70 °C	T	60227-2	2.4
2	<i>Provisions covering constructional and dimensional characteristics</i>		60227-1 and 60227-2	
2.1	Checking of compliance with constructional provisions	T, S	60227-1	Inspection and manual tests
2.2	Measurement of insulation thickness	T, S	60227-2	1.9
2.3	Measurement of overall diameter	T, S	60227-2	1.11
3	<i>Mechanical properties of insulation</i>			
3.1	Tensile test before ageing	T	60811-1-1	9.1
3.2	Tensile test after ageing	T	60811-1-2	8.1.3.1
3.3	Loss of mass test	T	60811-3-2	8.1
4	<i>Pressure test at high temperature</i>	T	60811-3-1	8.1
5	<i>Elasticity at low temperature</i>			
5.1	Bending test for insulation	T	60811-1-4	8.1
5.2	Elongation test for insulation ¹⁾	T	60811-1-4	8.3
6	<i>Heat shock test</i>	T	60811-3-1	9.1
7	<i>Test of flame retardance</i>	T	60332-1	

¹⁾ Only applicable if the overall diameter of the cable exceeds the limits specified in the test method.

4 Single-core non-sheathed cable with solid conductor for internal wiring for a conductor temperature of 70 °C

4.1 Code designation

60227 IEC 05.

4.2 Rated voltage

300/500 V.

4.3 Construction

4.3.1 Conductor

Number of conductors: 1.

The conductors shall comply with the requirements given in IEC 60228 for class 1 conductors.

4.3.2 Insulation

The insulation shall be polyvinyl chloride compound of type PVC/C, applied around the conductor.

The insulation thickness shall comply with the specified value given in column 2 of table 5.

The insulation resistance shall be not less than the value given in column 4 of table 5.

4.3.3 Overall diameter

The mean overall diameter shall not exceed the upper limit given in column 3 of table 5.

Table 5 – General data for type 60227 IEC 05

1	2	3	4	5
Nominal cross-sectional area of conductor mm ²	Thickness of insulation Specified value mm	Mean overall diameter		Minimum insulation resistance at 70 °C MΩ·km
		Lower limit mm	Upper limit mm	
0,5	0,6	1,9	2,3	0,015
0,75	0,6	2,1	2,5	0,012
1	0,6	2,2	2,7	0,011

4.4 Tests

Compliance with the requirements of 4.3 shall be checked by inspection and by the tests given in table 6.

4.5 Guide to use

Maximum conductor temperature in normal use: 70 °C.

NOTE – Other guidelines are under consideration.

Table 6 – Tests for type 60227 IEC 05

1	2	3	4	
Ref. No.	Test	Category of test	Test method described in IEC	Subclause
1	<i>Electric test</i>			
1.1	Resistance of conductors	T, S	60227-2	2.1
1.2	Voltage test at 2 000 V	T, S	60227-2	2.2
1.3	Insulation resistance at 70 °C	T	60227-2	2.4
2	<i>Provisions covering constructional and dimensional characteristics</i>		60227-1 and 60227-2	
2.1	Checking of compliance with constructional provisions	T, S	60227-1	Inspection and manual tests
2.2	Measurement of insulation thickness	T, S	60227-2	1.9
2.3	Measurement of overall diameter	T, S	60227-2	1.11
3	<i>Mechanical properties of insulation</i>			
3.1	Tensile test before ageing	T	60811-1-1	9.1
3.2	Tensile test after ageing	T	60811-1-2	8.1.3.1
3.3	Loss of mass test	T	60811-3-2	8.1
4	<i>Pressure test at high temperature</i>	T	60811-3-1	8.1
5	<i>Elasticity at low temperature</i>			
5.1	Bending test for insulation	T	60811-1-4	8.1
6	<i>Heat shock test</i>	T	60811-3-1	9.1
7	<i>Test of flame retardance</i>	T	60332-1	

5 Single-core non-sheathed cable with flexible conductor for internal wiring for a conductor temperature of 70 °C

5.1 Code designation

60227 IEC 06.

5.2 Rated voltage

300/500 V.

5.3 Construction

5.3.1 Conductor

Number of conductors: 1.

The conductors shall comply with the requirements given in IEC 60228 for class 5 conductors.

5.3.2 Insulation

The insulation shall be polyvinyl chloride compound of type PVC/C, applied around the conductor.

The insulation thickness shall comply with the specified values given in column 2 of table 7.

The insulation resistance shall be not less than the value given in column 4 of table 7.

5.3.3 Overall diameter

The mean overall diameter shall not exceed the upper limit given in column 3 of table 7.

Table 7 – General data for type 60227 IEC 06

1	2	3	4	5
Nominal cross-sectional area of conductor mm ²	Thickness of insulation Specified value mm	Mean overall diameter		Minimum insulation resistance at 70 °C MΩ·km
		Lower limit mm	Upper limit mm	
0,5	0,6	2,1	2,5	0,013
0,75	0,6	2,2	2,7	0,011
1	0,6	2,4	2,8	0,010

5.4 Tests

Compliance with the requirements of 5.3 shall be checked by inspection and by the tests given in table 8.

5.5 Guide to use

Maximum conductor temperature in normal use: 70 °C.

NOTE – Other guidelines are under consideration.

Table 8 – Tests for type 60227 IEC 06

1	2	3	4	
Ref. No.	Test	Category of test	Test method described in IEC	Subclause
1	<i>Electric test</i>			
1.1	Resistance of conductors	T, S	60227-2	2.1
1.2	Voltage test at 2 000 V	T, S	60227-2	2.2
1.3	Insulation resistance at 70 °C	T	60227-2	2.4
2	<i>Provisions covering constructional and dimensional characteristics</i>		60227-1 and 60227-2	
2.1	Checking of compliance with constructional provisions	T, S	60227-1	Inspection and manual tests
2.2	Measurement of insulation thickness	T, S	60227-2	1.9
2.3	Measurement of overall diameter	T, S	60227-2	1.11
3	<i>Mechanical properties of insulation</i>			
3.1	Tensile test before ageing	T	60811-1-1	9.1
3.2	Tensile test after ageing	T	60811-1-2	8.1.3.1
3.3	Loss of mass test	T	60811-3-2	8.1
4	<i>Pressure test at high temperature</i>	T	60811-3-1	8.1
5	<i>Elasticity at low temperature</i>			
5.1	Bending test for insulation	T	60811-1-4	8.1
6	<i>Heat shock test</i>	T	60811-3-1	9.1
7	<i>Test of flame retardance</i>	T	60332-1	

6 Single-core non-sheathed cable with solid conductor for internal wiring for a conductor temperature of 90 °C

6.1 Code designation

60227 IEC 07.

6.2 Rated voltage

300/500 V.

6.3 Construction

6.3.1 Conductor

Number of conductors: 1.

The conductors shall comply with the requirements given in IEC 60228 for class 1 conductors.

6.3.2 Insulation

The insulation shall be polyvinyl chloride compound of type PVC/E, applied around the conductor.

The insulation thickness shall comply with the specified value given in column 2 of table 9.

The insulation resistance shall be not less than the value given in column 4 of table 9.

6.3.3 Overall diameter

The mean overall diameter shall not exceed the upper limit given in column 3 of table 9.

Table 9 – General data for type 60227 IEC 07

1	2	3	4	5
Nominal cross-sectional area of conductor mm ²	Thickness of insulation Specified value mm	Mean overall diameter		Minimum insulation resistance at 90 °C MΩ·km
		Lower limit mm	Upper limit mm	
0,5	0,6	1,9	2,3	0,015
0,75	0,6	2,1	2,5	0,013
1	0,6	2,2	2,7	0,012
1,5	0,7	2,6	3,2	0,011
2,5	0,8	3,2	3,9	0,009

6.4 Tests

Compliance with the requirements of 6.3 shall be checked by inspection and by the tests given in table 10.

6.5 Guide to use

Maximum conductor temperature in normal use: 90 °C.

In circumstances in which it is possible to guard against thermoplastic flow, and reduced insulation resistance can be tolerated, PVC compound suitable for continuous use at 90 °C can be operated at temperatures up to 105 °C for a reduced total working duration.

NOTE – Other guidelines are under consideration.

Table 10 – Tests for type 60227 IEC 07

1	2	3	4	
Ref. No.	Test	Category of test	Test method described in IEC	Subclause
1	<i>Electric test</i>			
1.1	Resistance of conductors	T, S	60227-2	2.1
1.2	Voltage test at 2 000 V	T, S	60227-2	2.2
1.3	Insulation resistance at 90°C	T	60227-2	2.4
2	<i>Provisions covering constructional and dimensional characteristics</i>		60227-1 and 60227-2	
2.1	Checking of compliance with constructional provisions	T, S	60227-1	Inspection and manual tests
2.2	Measurement of insulation thickness	T, S	60227-2	1.9
2.3	Measurement of overall diameter	T, S	60227-2	1.11
3	<i>Mechanical properties of insulation</i>			
3.1	Tensile test before ageing	T	60811-1-1	9.1
3.2	Tensile test after ageing	T	60811-1-2	8.1.3.1
3.3	Loss of mass test	T	60811-3-2	8.1
4	<i>Pressure test at high temperature</i>	T	60811-3-1	8.1
5	<i>Elasticity at low temperature</i>			
5.1	Bending test for insulation	T	60811-1-4	8.1
6	<i>Heat shock test</i>	T	60811-3-1	9.1
7	<i>Test of flame retardance</i>	T	60332-1	
8	<i>Thermal stability</i>	T	60811-3-2	9

7 Single-core non-sheathed cable with flexible conductor for internal wiring for a conductor temperature of 90 °C

7.1 Code designation

60227 IEC 08.

7.2 Rated voltage

300/500 V.

7.3 Construction

7.3.1 Conductor

Number of conductors: 1.

The conductors shall comply with the requirements given in IEC 60228 for class 5 conductors.

7.3.2 Insulation

The insulation shall be polyvinyl chloride compound of type PVC/E, applied around the conductor.

The insulation thickness shall comply with the specified value given in column 2 of table 11.

The insulation resistance shall be not less than the value given in column 4 of table 11.

7.3.3 Overall diameter

The mean overall diameter shall not exceed the upper limit given in column 3 of table 11.

Table 11 – General data for type 60227 IEC 08

1	2	3	4	5
Nominal cross-sectional area of conductor mm ²	Thickness of insulation Specified value mm	Mean overall diameter		Minimum insulation resistance at 90 °C MΩ·km
		Lower limit mm	Upper limit mm	
0,5	0,6	2,1	2,5	0,013
0,75	0,6	2,2	2,7	0,012
1	0,6	2,4	2,8	0,010
1,5	0,7	2,8	3,4	0,009
2,5	0,8	3,4	4,1	0,009

7.4 Tests

Compliance with the requirements of 7.3 shall be checked by inspection and by the test given in table 12.

7.5 Guide to use

Maximum conductor temperature in normal use: 90 °C.

In circumstances in which it is possible to guard against thermoplastic flow, and reduced insulation resistance can be tolerated, PVC compound suitable for continuous use at 90 °C can be operated at temperatures up to 105 °C for a reduced total working duration.

NOTE – Other guidelines are under consideration.

Table 12 – Tests for type 60227 IEC 08

1	2	3	4	
Ref. No.	Test	Category of test	Test method described in IEC	Subclause
1	<i>Electric test</i>			
1.1	Resistance of conductors	T, S	60227-2	2.1
1.2	Voltage test at 2 000 V	T, S	60227-2	2.2
1.3	Insulation resistance at 90 °C	T	60227-2	2.4
2	<i>Provisions covering constructional and dimensional characteristics</i>		60227-1 and 60227-2	
2.1	Checking of compliance with constructional provisions	T, S	60227-1	Inspection and manual tests
2.2	Measurement of insulation thickness	T, S	60227-2	1.9
2.3	Measurement of overall diameter	T, S	60227-2	1.11
3	<i>Mechanical properties of insulation</i>			
3.1	Tensile test before ageing	T	60811-1-1	9.1
3.2	Tensile test after ageing	T	60811-1-2	8.1.3.1
3.3	Loss of mass test	T	60811-3-2	8.1
4	<i>Pressure test at high temperature</i>	T	60811-3-1	8.1
5	<i>Elasticity at low temperature</i>			
5.1	Bending test for insulation	T	60811-1-4	8.1
6	<i>Heat shock test</i>	T	60811-3-1	9.1
7	<i>Test of flame retardance</i>	T	60332-1	
8	<i>Thermal stability</i>	T	60811-3-2	9