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Remarks:

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**IEC 60799:2022**

Edition 3.1

## **SOUTH AFRICAN NATIONAL STANDARD**

### **Electrical accessories — Cord sets and interconnection cord sets**

This national standard is the identical implementation of IEC 60799:2022 and is adopted with the permission of the International Electrotechnical Commission.

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**Table of changes**

<b>Change No.</b>	<b>Date</b>	<b>Scope</b>
IEC amdt 1	2022	Amended to update referenced standards, terms and definitions, and requirements.

**National foreword**

This South African standard was prepared by National Committee SABS/TC 067/SC 03, *Electricity distribution systems and components – Electrical accessories*, in accordance with procedures of the South African Bureau of Standards, in compliance with annex 3 of the WTO/TBT agreement.

This document was approved for publication in xxxxx 20XXXXX.

This document supersedes SANS 60799:2019 (edition 2).

This document is referenced in the *Compulsory specification for cord sets and cord extension sets*, as published by Government Notice No. 1011 (Government Gazette 28122) of 21 October 2005.

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IEC 60799

Edition 3.1 2022-10  
CONSOLIDATED VERSION

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Electrical accessories – Cord sets and interconnection cord sets**

**Petit appareillage électrique – Cordons-connecteurs et cordons-connecteurs  
d'interconnexion**



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Edition 3.1 2022-10  
CONSOLIDATED VERSION

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Electrical accessories – Cord sets and interconnection cord sets**

**Petit appareillage électrique – Cordons-connecteurs et cordons-connecteurs d'interconnexion**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
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**VERSION FINALE**

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**Electrical accessories – Cord sets and interconnection cord sets**

**Petit appareillage électrique – Cordons-connecteurs et cordons-connecteurs d'interconnexion**

## CONTENTS

FOREWORD .....	3
1 Scope .....	5
2 Normative references .....	5
3 Terms and definitions .....	5
4 General requirements .....	6
5 Requirements .....	7
5.1 Requirements for component parts .....	7
5.2 Requirements for the assembly .....	7
5.2.1 Rated voltage .....	7
5.2.2 Rated current .....	7
5.2.3 Class of equipment .....	7
5.2.4 Marking .....	8
5.2.5 Type of cord .....	8
5.2.6 Derated current of cord set for use at higher ambient temperatures .....	9
5.2.7 Derated current of interconnection cord set for use at higher ambient temperatures .....	9
6 Continuity and polarity .....	9
7 EMC requirements .....	10
7.1 Immunity for cord sets and interconnection cord sets not incorporating electronic components .....	10
7.2 Emission for cord sets and interconnection cord sets not incorporating electronic components .....	10
Annex A (normative) Routine tests for factory-wired cord sets and interconnection cord sets related to safety (protection against electric shock and correct polarity) .....	11
A.1 General .....	11
A.2 Polarized systems: phase (L) and neutral (N) – Correct connection .....	11
A.3 Earth (PE) continuity .....	12
A.4 Short-circuit/wrong connection and reduction in creepage distance and clearance .....	12
A.4.1 Accessible surface safety check .....	12
A.4.2 Short-circuit/wrong connection .....	12
Table 1 – Types of cords for cord sets and interconnection cord sets .....	9
Table A.1 – Test overview .....	11

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### ELECTRICAL ACCESSORIES – CORD SETS AND INTERCONNECTION CORD SETS

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**This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.**

International Standard IEC 60799 has been prepared by subcommittee 23G: Appliance couplers, of IEC technical committee 23: Electrical accessories.

This third edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) alignment with IEC 60320-1:2015;
- b) extension to include appliance couplers in accordance with IEC 60320-2-3:–1.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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<sup>1</sup> Under preparation. Stage at the time of publication: IEC/FDIS 60320-2-3:2018.

## ELECTRICAL ACCESSORIES – CORD SETS AND INTERCONNECTION CORD SETS

### 1 Scope

This document specifies requirements for cord sets and interconnection cord sets for household and similar general purpose equipment.

It does not apply to cord sets for industrial purposes (with plugs and connectors according to IEC 60309) nor to cord extension sets.

NOTE Although electrical supply flexes provided with rewirable plugs and connectors are not cord sets in the sense of this document, but considered as being similar to cord sets and serving the same purpose, the requirements as specified in this document are also applicable to such assemblies as well as far as is reasonable.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC TR 60083, *Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC*

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

IEC 60245 (all parts), *Rubber insulated cables – Rated voltages up to and including 450/750 V*

IEC 60320-1:2021, *Appliance couplers for household and similar general purposes – Part 1: General requirements*

IEC 60320-2-3, *Appliance coupler for household and similar general purposes – Part 2-3: Appliance coupler with a degree of protection higher than IPX0*

IEC 60884-1:2022, *Plugs and socket-outlets for household and similar purposes – Part 1: General requirements*

IEC 61140, *Protection against electric shock – Common aspects for installation and equipment*

### 3 Terms and definitions

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

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

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

### 3.1

#### **cord set**

assembly consisting of one flexible cable or cord fitted with one non-rewirable plug and one non-rewirable connector, intended for the connection of an electrical appliance or equipment to the electrical supply

#### 3.1.1

##### **cord set for use at higher ambient temperatures**

cord set in which the plug and the connector are complying with the requirements for use at higher ambient temperatures, according to IEC 60884-1 and IEC 60320-1, respectively

### 3.2

#### **interconnection cord set**

assembly consisting of one cable or cord fitted with one non-rewirable plug connector and one non-rewirable connector, intended for the interconnection between two electrical appliances

[SOURCE: IEC 60050-442:1998, 442-07-06, modified – "a" has been changed to "one" in two places, "flexible cable" has been replaced by "cable", and "between two electrical appliances" replaces "of the electrical supply from one electrical appliance or equipment to another".]

#### 3.2.1

##### **interconnection cord set for use at higher ambient temperatures**

interconnection cord set in which the plug connector and the connector are complying with the requirements for use at higher ambient temperatures, according to IEC 60320-1

### 3.3

#### **non-rewirable accessory**

accessory so constructed that it forms a complete unit with flexible supply cable or cord after connection and assembly by the manufacturer of the accessory

### 3.4

#### **type test**

test of one or more devices made to a certain design to show that the design meets certain requirements

[SOURCE: IEC 60050-811:1991, 811-10-04, modified – In the definition, "requirements" has replaced "specifications".]

### 3.5

#### **routine test**

conformity test made on each individual item during or after manufacture

[SOURCE: IEC 60050-151:2001, 151-16-17]

## 4 General requirements

Cord sets and interconnection cord sets shall be so designed and constructed that in normal use their performance is reliable and without danger to the user or surroundings.

Tests shall be made to prove compliance with the requirements laid down in this document, where applicable.

Tests are as follows:

- type tests are made on representative samples of each cord set and interconnection cord set;

IEC 60799:2018+AMD1:2022 CSV – 7 –  
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- routine tests are made on each cord set and interconnection cord set manufactured to this document, where applicable.

NOTE Routine tests are specified in Annex A.

## 5 Requirements

### 5.1 Requirements for component parts

The plug of a cord set shall comply with the requirements of IEC 60884-1.

Plugs for use in a cord set for higher ambient temperatures shall additionally comply with Annex H of IEC 60884-1:2022.

The connector of a cord set or of an interconnection cord set shall comply with the requirements of IEC 60320-1.

The connector of a cord set or of an interconnection cord set for use at higher ambient temperatures shall additionally comply with the requirements of Annex E of IEC 60320-1:2021.

The plug connector of an interconnection cord set shall comply with the requirements of IEC 60320-1.

The plug connector of an interconnection cord set for use at higher ambient temperatures shall additionally comply with the requirements of Annex E of IEC 60320-1:2021.

The connector, with a degree of protection higher than IPX0, of a cord set or an interconnection cord set shall comply with the requirements of IEC 60320-2-3.

The plug connector, with a degree of protection higher than IPX0, of an interconnection cord set shall comply with the requirements of IEC 60320-2-3.

The cord of a cord set or of an interconnection cord set shall comply with the requirements of relevant IEC International Standards.

Compliance with the requirements for plugs, connectors, plug connectors and cords is checked by the tests specified in the relevant standards. During the test of one component, the influence on the other components of the assembly is ignored.

### 5.2 Requirements for the assembly

#### 5.2.1 Rated voltage

The rated voltage of the connector and the cord shall be not less than the rated voltage of the plug. For interconnection cord sets, the rated voltage of the connector and the plug connector shall be the same.

#### 5.2.2 Rated current

The rated current of the plug or plug connector shall be not less than the rated current of the connector.

#### 5.2.3 Class of equipment

The plug and the connector shall be of a type intended for the connection of the same class of equipment, as given in IEC 61140.



A cord set comprising a connector for class II equipment may, however, comprise a plug with three pins according to IEC TR 60083 or to other three-pin systems.

#### 5.2.4 Marking

Plugs, connectors and plug connectors shall be marked as specified in the relevant standards.

Cord sets and interconnection cord sets that are not delivered together with an appliance and of which the plug or the plug connector and the connector have not been made by the same manufacturer shall, in addition, be marked with either the name, trademark or identification mark of the maker of the complete cord set or interconnection cord set or of the responsible vendor.

This marking shall not only be put on the package.

NOTE The marking of the name, trademark or identification mark of the maker or responsible vendor can, for example, be applied on a sleeve provided around the cord set.

Plugs, connectors, cord sets or interconnection cord sets for the connection of class II equipment shall not be marked with the symbol for class II construction (the double square).

#### 5.2.5 Type of cord

The cord of a cord set or interconnection cord set shall be not lighter than the type and have a cross-sectional area not less than those specified in Table 1, depending on the type of connector incorporated in the cord set or interconnection cord set.

NOTE A cord of a lower IEC code designation is lighter than a cord of a higher code designation. For example, 60227 IEC 42 is lighter than 60227 IEC 53.

**Table 1 – Types of cords for cord sets and interconnection cord sets**

Type of connector or plug connector	Type of cord <sup>a</sup>	Nominal cross-sectional area
		mm <sup>2</sup>
0,2 A	60227 IEC 41 <sup>b</sup>	–
2,5 A for class I equipment	60227 IEC 52	0,75
2,5 A for class II equipment	60227 IEC 52	0,75 <sup>c</sup>
6 A	60227 IEC 52	0,75
10 A for cold conditions	60227 IEC 53 or 60245 IEC 53	0,75 <sup>d</sup>
10 A for hot conditions	60245 IEC 53 60245 IEC 89	0,75 <sup>d,e</sup>
10 A for very hot conditions	60245 IEC 53 60245 IEC 89	0,75 <sup>d,e</sup>
16 A for cold conditions	60227 IEC 53 or 60245 IEC 53	1,0 <sup>d</sup>
16 A for very hot conditions	60245 IEC 53 60245 IEC 89	1,0 <sup>d,e</sup>

NOTE For a cross-sectional area using American Wire Gauge (AWG), see Annex D of IEC 60320-1:2021.

<sup>a</sup> Other cable or cord with equivalent properties may also be used.

<sup>b</sup> Length not exceeding 2 m.

<sup>c</sup> If the cord has a length not exceeding 2 m, a nominal cross-sectional area of 0,5 mm<sup>2</sup> is allowed.

<sup>d</sup> If the cord has a length exceeding 2 m, nominal cross-sectional areas shall be minimum

- 1,0 mm<sup>2</sup> for 10 A connectors;
- 1,5 mm<sup>2</sup> for 16 A connectors.

<sup>e</sup> Cords for plug connectors and connectors for higher ambient temperatures shall have a temperature rating of minimum +90 °C.

Compliance with the requirements of 5.2.1 to 5.2.7 is checked by inspection.

### 5.2.6 Derated current of cord set for use at higher ambient temperatures

The maximum ambient temperature at rated current,  $t_a$ , of the cord set for use at higher ambient temperatures is equal to the lowest of the two  $t_a$  values of the plug and the connector.

### 5.2.7 Derated current of interconnection cord set for use at higher ambient temperatures

The maximum ambient temperature at rated current,  $t_a$ , of the interconnection cord set for use at higher ambient temperatures is equal to the lowest of the two  $t_a$  values of the plug connector and the connector.

## 6 Continuity and polarity

In cord sets and interconnection cord sets for use in polarized systems, the continuity between corresponding pins of plugs/plug connectors and contacts of connectors shall be maintained correctly in each pole.

Compliance is checked by inspection.

## 7 EMC requirements

NOTE Requirements for accessories incorporating electronic components are not included as the need has not yet been established.

### 7.1 Immunity for cord sets and interconnection cord sets not incorporating electronic components

These cord sets and interconnection cord sets are not sensitive to normal electromagnetic disturbances and therefore no immunity tests are required.

### 7.2 Emission for cord sets and interconnection cord sets not incorporating electronic components

These cord sets and interconnection cord sets are not generating electromagnetic disturbances, consequently no emission tests are necessary.

NOTE These cord sets and interconnection cord sets can only generate electromagnetic disturbances during occasional operations of insertion and withdrawal of the accessories. The frequency, the level and the consequences of these emissions are considered as part of the normal electromagnetic environment.

## Annex A (normative)

### Routine tests for factory-wired cord sets and interconnection cord sets related to safety (protection against electric shock and correct polarity)

#### A.1 General

All factory wired cord sets and interconnection cord sets shall be subjected to the following tests as shown in Table A.1.

Table A.1 – Test overview

Type of accessory	Test to be performed according to ...
Two-pole accessories	A.2, A.4.1
More than two-pole accessories	A.2, A.3, A.4

Failed samples shall be treated in such a way that they cannot fulfill the intended function or be separated from satisfactory products in such a way that they cannot be released for sale.

It shall be possible to identify that appliance couplers released for sale have been subjected to the routine test.

The manufacturer shall maintain a record of the tests carried out that shows:

- type of product;
- date of test;
- place of manufacture (if manufactured in more than one place);
- tested quantity;
- number of failures and actions taken, i.e. destroyed/repaired.

The test equipment shall be checked before and after each period of use and for periods of continuous use, at least every 24 h. During these checks, the equipment shall show that it indicates faults when known faulty products are inserted or simulated faults are applied.

Products manufactured prior to a check shall only be released for sale if the check is found to be satisfactory.

Test apparatus/equipment shall be verified/calibrated at least once a year.

Records shall be kept of all checks and any adjustments found necessary.

#### A.2 Polarized systems: phase (L) and neutral (N) – Correct connection

For polarized systems the test shall be made by applying a current for a period of not less than 2 s between the L and N pin or contact and the corresponding L and N pin or contact of the accessory (connector, plug connector or plug) at each end of the cord set or interconnection cord set.

The period of 2 s may be reduced to not less than 1 s on test equipment with automatic timing.

Polarity shall be correct.

### **A.3 Earth (PE) continuity**

The test shall be made applying a current for a period of not less than 2 s between the PE pin or contact of the accessory (connector, plug connector or plug) at each end of the cord set or interconnection cord set.

The period of 2 s may be reduced to not less than 1 s on test equipment with automatic timing.

Other suitable tests may be used.

Continuity shall be present.

### **A.4 Short-circuit/wrong connection and reduction in creepage distance and clearance**

#### **A.4.1 Accessible surface safety check**

For cord sets and interconnection cord sets with non-rewirable accessories (connectors, plugs connectors and plugs), it shall be checked that live parts, for example loose strands, are not coming through the accessible surface of the accessory.

If this danger cannot be prevented by the construction and/or suitable manufacturing processes, the following test or a similar one (e.g. impulse voltage test) shall be performed.

The accessible surface of accessories (connectors, plugs connectors and plugs), except the engagement face of the accessories, is scanned by adjusted electrodes and a pressure force of 20 N.

Through the live parts and the surface of the appliance coupler, an AC voltage of  $(2\ 000 \pm 200)$  V shall be applied for at least 1 s.

Neither a flashover nor a breakdown shall occur.

#### **A.4.2 Short-circuit/wrong connection**

The test shall be made between the L and N conductors and the E conductor by applying at the supply end an AC voltage of  $(2\ 000 \pm 200)$  V, 50 Hz or 60 Hz for a period of not less than 2 s or by an impulse voltage test using 1,2/50  $\mu$ s wave form, 4 kV peak value, three impulses for each pole, with intervals of not less than 1 s, the test voltage being applied at the supply end.

The period of 2 s may be reduced to not less than 1 s on test equipment with automatic timing.

The L and N conductors may be connected together for this test.

No flashover shall occur.

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