IEC 60227-5

Edition 4.0 2024-02
REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V –
Part 5: Flexible cables (cords)



IEC 60227-5:2024-02 RLV(en)

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Part 5: Flexible cables (cords)

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.060.20

ISBN 978-2-8322-8370-7

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 5: Flexible cables (cords)

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). 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. 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 redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60227-5:2011. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 60227-5 has been prepared by IEC technical committee 20: Electric cables. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2011. This edition constitutes a technical revision.

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

a) the reference to tests according to IEC 60227-2 has been withdrawn and replaced with a reference to IEC 63294;
b) normative references have been updated.

The text of this International Standard is based on the following documents:

Draft	Report on voting
20/2143/FDIS	20/2156/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60227 series, published under the general title *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*, can be found on the IEC website.

This document is to be used in conjunction with IEC 60227-1:—[1].

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

[1] Fourth edition under preparation. Stage at the time of publication IEC FDIS 60227-1:2023.

INTRODUCTION

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

IEC 60227-1, General requirements;

IEC 60227-2, Test methods (withdrawn and replaced by IEC 63294);

IEC 60227-3, Non-sheathed cables for fixed wiring;

IEC 60227-4, Sheathed cables for fixed wiring;

IEC 60227-5, Flexible cables (cords);

IEC 60227-6, Lift cables and cables for flexible connections;

IEC 60227-7, Flexible cables screened and unscreened with two or more conductors and of rated voltages up to and including 300/500 V.

This part of IEC 60227, when used in conjunction with IEC 60227-1, forms the complete standard for flexible cables (cords).

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

Part 5: Flexible cables (cords)

~~1 General~~

1 Scope

This part of IEC 60227 details the particular specifications or polyvinyl chloride insulated flexible cables (cords), of rated voltages up to and including 300/500 V.

~~All cables comply with the appropriate requirements given in IEC 60227-1 and each individual type of cable complies with the particular requirements of this part.~~

This document provides the particular requirements for flexible cables (cords) which apply in addition to the appropriate requirements specified in IEC 60227-1, which apply to all cables.

The tests for cables specified in the IEC 60227 series are described in IEC 63294.

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.

~~NOTE The IEC 60811 series is currently undergoing a revision, which will lead to a restructuring of its parts. A description of this, as well as a cross-reference table between the current and planned parts will be given in IEC 60811-100.~~

IEC 60227-1:~~2007~~ [2], *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 1: General requirements*

~~IEC 60227-2:1997, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 2: Test methods*~~
~~Amendment 1 (2003)~~

IEC 60228, *Conductors of insulated cables*

IEC 60332-1-2, *Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame*

~~IEC 60811-1-1:1993, *Common test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section 1: Measurement of thickness and overall dimensions – Tests for determining the mechanical properties*~~
~~Amendment 1 (2001)~~

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2 Fourth edition under preparation. Stage at the time of publication IEC FDIS 60227-1:2023.

~~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)~~
~~Amendment 2 (2000)~~

~~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*~~
~~Amendment 1 (1993)~~
~~Amendment 2 (2001)~~

~~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*~~
~~Amendment 1 (1994)~~
~~Amendment 2 (2001)~~

~~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 test*~~
~~Amendment 1 (1993)~~
~~Amendment 2 (2003)~~

IEC 60811-401, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 401: Miscellaneous tests – Thermal ageing methods – Ageing in an air oven*

IEC 60811-405, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 405: Miscellaneous tests – Thermal stability test for PVC insulations and PVC sheaths*

IEC 60811-409, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 409: Miscellaneous tests – Loss of mass test for thermoplastic insulations and sheaths*

IEC 60811-501, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 501: Mechanical tests – Tests for determining the mechanical properties of insulating and sheathing compounds*

IEC 60811-504, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 504: Mechanical tests – Bending tests at low temperature for insulation and sheaths*

IEC 60811-505, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 505: Mechanical tests – Elongation at low temperature for insulations and sheaths*

IEC 60811-506, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 506: Mechanical tests – Impact test at low temperature for insulations and sheaths*

IEC 60811-508, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 508: Mechanical tests – Pressure test at high temperature for insulation and sheaths*

IEC 60811-509, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 509: Mechanical tests – Test for resistance of insulations and sheaths to cracking (heat shock test)*

IEC 62440, *Electric cables with a rated voltage not exceeding 450/750 V – Guide to use*

IEC 63294:2021, *Test methods for electric cables with rated voltages up to and including 450/750 V*.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60227-1 and the following apply.

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

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

3.1
type test
test made before supplying a type of cable covered by this document on a general commercial basis in order to demonstrate satisfactory performance characteristics to meet the intended application

Note 1 to entry: Type tests are of such a nature that, after they have been made, it is not necessary for them to be repeated, unless changes are made in the cable materials or design which can change the performance characteristics.

Note 2 to entry: The symbol T is used to refer to type tests.

3.2
sample test
test made on samples of completed cable or components taken from a completed cable to verify that the finished product meets the design standards

Note 1 to entry: The symbol S is used to refer to sample tests.

4 Flat tinsel cord

4.1 Code designation

60227 IEC 41.

4.2 Rated voltage

300/300 V.

4.3 Construction

4.3.1 Conductors

Number of conductors: 2.

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

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

4.3.2 Insulation

The insulation shall be polyvinyl chloride compound of type PVC/D applied around each conductor.

The specified value of the insulation thickness ~~shall comply with the specified value~~ is given in Table 1, column 1.