

# INTERNATIONAL STANDARD

**IEC**  
**62255-2**

First edition  
2005-06

---

---

**Multicore and symmetrical pair/quad cables  
for broadband digital communications  
(high bit rate digital access telecommunication  
networks) – Outside plant cables –**

**Part 2:  
Unfilled cables – Sectional specification**

*Teht Standards  
(https://standards.iteh.ai)  
Document Preview*

[IEC 62255-2:2005](https://standards.iteh.ai/catalog/standards/iec/e82fd1d9-1064-4f2d-b292-f0802f7ab204/iec-62255-2-2005)

<https://standards.iteh.ai/catalog/standards/iec/e82fd1d9-1064-4f2d-b292-f0802f7ab204/iec-62255-2-2005>



Reference number  
IEC 62255-2:2005(E)

## Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

## Consolidated editions

The IEC is now publishing consolidated versions of its publications. 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.

## Further information on IEC publications

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 this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

- **IEC Web Site** ([www.iec.ch](http://www.iec.ch))

- **Catalogue of IEC publications**

The on-line catalogue on the IEC web site ([www.iec.ch/searchpub](http://www.iec.ch/searchpub)) enables you to search by a variety of criteria including text searches, technical committees and date of publication. On-line information is also available on recently issued publications, withdrawn and replaced publications, as well as corrigenda.

- **IEC Just Published**

This summary of recently issued publications ([www.iec.ch/online\\_news/justpub](http://www.iec.ch/online_news/justpub)) is also available by email. Please contact the Customer Service Centre (see below) for further information.

- **Customer Service Centre**

If you have any questions regarding this publication or need further assistance, please contact the Customer Service Centre:

Email: [custserv@iec.ch](mailto:custserv@iec.ch)  
Tel: +41 22 919 02 11  
Fax: +41 22 919 03 00

<https://standards.iteh.ai/catalog/standards/iec/e82fd1d9-1064-4f2d-b292-f0802f7ab204/iec-62255-2-2005>

# INTERNATIONAL STANDARD

**IEC**  
**62255-2**

First edition  
2005-06

---

---

**Multicore and symmetrical pair/quad cables  
for broadband digital communications  
(high bit rate digital access telecommunication  
networks) – Outside plant cables –**

**Part 2:  
Unfilled cables – Sectional specification**

*Teht Standards  
(https://standards.iteh.ai)  
Document Preview*

IEC 62255-2:2005

<https://standards.iteh.ai/catalog/standards/iec/e82fd1d9-1064-4f2d-b292-f0802f7ab204/iec-62255-2-2005>

© IEC 2005 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland  
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: [inmail@iec.ch](mailto:inmail@iec.ch) Web: [www.iec.ch](http://www.iec.ch)



Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

PRICE CODE

**P**

*For price, see current catalogue*

## CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions .....	5
4 Installation considerations.....	6
5 Materials and cable construction .....	6
5.1 General remarks.....	6
5.2 Cable construction.....	6
5.3 Conductor.....	6
5.4 Insulation.....	6
5.5 Colour code .....	6
5.6 Cable element .....	6
5.7 Cable make-up .....	6
5.8 Filling compound .....	7
5.9 Flooding compound .....	7
5.10 Screening of the cable core .....	7
5.11 Sheath.....	7
5.12 Rip-cord .....	7
5.13 Colour of the sheath .....	7
5.14 Strength members .....	8
5.15 Identification.....	8
5.16 Packaging of the finished cable.....	8
6 Characteristics and requirements .....	8
6.1 Electrical requirements .....	8
6.2 Transmission requirements.....	10
6.3 Mechanical and dimensional characteristics and requirements of the cable .....	12
6.4 Environmental requirements .....	14
7 Introduction to the blank detail specification .....	15
Table 1 – Conductor resistance .....	8
Table 2 – Test voltages .....	9
Table 3 – Test voltages .....	9
Table 4 – Attenuation coefficients.....	11
Table 5 – Values of PSNEXT(1) .....	11
Table 6 – Values of PSELFEXT(1).....	12
Table 7 – Return loss .....	12

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MULTICORE AND SYMMETRICAL PAIR/QUAD CABLES  
FOR BROADBAND DIGITAL COMMUNICATIONS  
(HIGH BIT RATE DIGITAL ACCESS TELECOMMUNICATION  
NETWORKS) – OUTSIDE PLANT CABLES –**

**Part 2: Unfilled cables – Sectional specification**

## 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62255-2 has been prepared by subcommittee 46C: Wires and symmetric cables, of IEC technical committee 46: Cables, wires, waveguides, r.f. connectors, r.f. and microwave passive components and accessories.

The text of this standard is based on the following documents:

FDIS	Report on voting
46C/714/FDIS	46C/729/RVD

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

This standard is to be read in conjunction with IEC 62255-1.

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

IEC 62255 consists of the following parts, under the general title *Multicore and symmetrical pair/quad cables for broadband digital communications (high bit rate digital access telecommunications networks) – Outside plant cables*:

- Part 1: Generic specification
- Part 2: Unfilled cables – Sectional specification
- Part 2-1: Unfilled cables – Blank detail specification
- Part 3: Filled cables – Sectional specification
- Part 3-1: Filled cables – Blank detail specification
- Part 4: Aerial drop cables – Sectional specification
- Part 4-1: Aerial drop cables – Blank detail specification
- Part 5: Filled drop cables – Sectional specification
- Part 5-1: Filled drop cables – Blank detail specification

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

[IEC 62255-2:2005](https://standards.iteh.ai/catalog/standards/iec/e82fd1d9-1064-4f2d-b292-f0802f7ab204/iec-62255-2-2005)

<https://standards.iteh.ai/catalog/standards/iec/e82fd1d9-1064-4f2d-b292-f0802f7ab204/iec-62255-2-2005>

# MULTICORE AND SYMMETRICAL PAIR/QUAD CABLES FOR BROADBAND DIGITAL COMMUNICATIONS (HIGH BIT RATE DIGITAL ACCESS TELECOMMUNICATION NETWORKS) – OUTSIDE PLANT CABLES –

## Part 2: Unfilled cables – Sectional specification

### 1 Scope

This sectional specification relates to IEC 62255-1.

This standard is applicable to unfilled cables having a metallic screen over the cable core, a polyethylene jacket, copper conductors, and solid or cellular insulation. An inner polyethylene jacket under the metallic screen may be provided. These cables are typically available in 6 to 300 pair.

These cables are suitable for installation into ducts or installed aerially by lashing to a support strand or by being self-supporting. The self-supporting properties may be achieved by utilizing a galvanized steel strength member or by an integral or multi-layers of glass or synthetic reinforcing members.

The cables covered by this specification are differentiated by bandwidth and are classified by having a maximum reference frequency of 30 MHz, 60 MHz, or 100 MHz.

### 2 Normative references

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

IEC 60304, *Standard colours for insulation for low-frequency cables and wires*

IEC 60708-1, *Low-frequency cables with polyolefin insulation and moisture barrier polyolefin sheath – Part 1: General design details and requirements*

IEC 62255-1, *Multicore and symmetrical pair/quad cables for broadband digital communications (high bit rate digital access telecommunication networks) – Outside plant cables – Part 1: Generic specification*

IEC 62255-2-1, *Multicore and symmetrical pair/quad cables for broadband digital communications (high bit rate digital access telecommunication networks) – Outside plant cables – Part 2-1: Unfilled cables – Blank detail specification*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62255-1 shall apply.

## 4 Installation considerations

See Clause 4 of IEC 62255-1.

## 5 Materials and cable construction

### 5.1 General remarks

The choice of materials and cable construction shall be suitable for the intended application and method of installation of the cable.

### 5.2 Cable construction

The cable construction shall be in accordance with the materials, dimensions, and assembly details given in the relevant detail specification.

### 5.3 Conductor

The conductor shall be a solid annealed copper conductor having a diameter between 0,5 mm and 0,9 mm. Factory joints are permitted. The breaking strength of a joint shall not be less than 90 % of that of an unjointed conductor.

### 5.4 Insulation

The conductor shall be insulated with a suitable polyolefin material.

The type of the conductor insulation shall be solid or cellular or any combination thereof. The insulation may be made with or without a solid dielectric skin. The skin material may be different than the base material. Other multi-layer systems may be used.

The insulation shall be continuous and shall have a thickness such that the finished cable meets the specified requirements.

Joints in the insulated conductor are allowed. Joints shall be free from lumps and reinsulated with a non-hygroscopic dielectric material.

The nominal thickness shall be compatible with the method of conductor termination.

### 5.5 Colour code

The colour code of the insulation is not specified but shall be indicated in the relevant detail specification. The colours shall be readily identifiable and shall correspond reasonably with the standard colours shown in IEC 60304.

### 5.6 Cable element

The cable element shall be a twisted pair or quad.

### 5.7 Cable make-up

The cable elements shall be formed into a number of sub-units or units that can be stranded into a circular core so as to provide the required number of pairs.

The core of the cable may be wrapped with a protective layer(s) of a non-hygroscopic material.



## **5.8 Filling compound**

Not applicable.

## **5.9 Flooding compound**

Not applicable.

## **5.10 Screening of the cable core**

The core of the cable shall be screened with either a single metal tape or a dual metal tape system.

### **5.10.1 Single tape system**

The single metal tape shall consist of an aluminium screen coated on at least one side with a plastic material. The minimum thickness of the aluminium shall not be less than 0,15 mm.

The aluminium may be applied flat or corrugated. The edges of the tape shall overlap. If applied flat, the tape shall bond to the jacket and to itself at the overlap.

### **5.10.2 Dual tape system**

The dual metal tape system shall consist of an aluminium screen, with or without a plastic coating, and a steel armour. The steel armour may be bare, galvanized, or coated on both sides with a plastic material. The minimum thickness of the aluminium tape and of the steel tape shall not be less than 0,15 mm.

Both the aluminium and steel shall be corrugated. The edges of the aluminium may overlap. The steel shall overlap.

## **5.11 Sheath**

The sheath shall consist of a suitable polyethylene material applied over the screen or armour. Examples of suitable polyethylenes are:

- linear low density polyethylene;
- medium density polyethylene;
- high density polyethylene.

The polyethylene shall contain  $(2,5 \pm 0,5)$  % by weight carbon black.

An inner polyethylene jacket may be applied between the core of the cable and the aluminium screen.

## **5.12 Rip-cord**

A rip-cord(s) may be provided. When present, the rip-cord shall be non-hygroscopic and non-wicking.

## **5.13 Colour of the sheath**

The sheath shall be black.

### 5.14 Strength members

For aerial cables containing an integral suspension strand, the sheath shall consist of the cable core, metal tape(s), and a steel support messenger jacketed in an integral extrusion to form a Figure 8. The dimensions and the minimum breaking strength of the strand shall be indicated in the relevant detail specification. Splicing of the strand is not permitted.

Alternately, the sheath of the cable may contain strength members. The strength member(s) may consist of a solid or stranded steel wire, which may be coated or bare. The strength member may also consist of glass or synthetic fibres, or any combination thereof. The glass or synthetic fibres may be either in the form of rovings or yarns and may have a polymeric coating to enhance their adhesion to the sheathing material.

### 5.15 Identification

The outer sheath of each length of cable shall be durably marked with the following information.

- Manufacturer's name or trademark.
- Year of manufacture.
- Pair count.
- Conductor diameter.
- Sequential length markings in metres.

### 5.16 Packaging of the finished cable

The method of packaging is not specified but may be specified in the relevant detail specification.

## 6 Characteristics and requirements

This clause lists the characteristics and minimum requirements of a cable complying with this specification. Test methods shall be in accordance with Clause 6 of IEC 62255-1. A detail specification may be prepared to identify a specific product and its performance capabilities (see Clause 7).

### 6.1 Electrical requirements

The tests shall be carried out on a cable length of not less than 100 m, unless otherwise specified.

#### 6.1.1 Conductor resistance

The electrical resistance of any conductor when measured at or corrected to a temperature of 20 °C shall not exceed the values given in Table 1.

**Table 1 – Conductor resistance**

Conductor diameter mm	Resistance at 20 °C Ω/km
0,5	95,9
0,6	66,6
0,65	56,3
0,8	36,8
0,9	29,4