INTERNATIONAL STANDARD

IEC 62255-3

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 3: Filled cables – Sectional specification

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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 Web: www.iec.ch

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 3: Filled cables – Sectional specification

FOREWORD

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International Standard IEC 62255-3 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/716/FDIS	46C/731/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.

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

Part 3: Filled cables – Sectional specification

1 Scope

This sectional specification relates to IEC 62255-1.

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

These cables are suitable for direct burial, installation into ducts, or installed aerially by lashing to a support strand. They may also be self-supporting by incorporation of an integral suspension strand.

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 62255-3-1, *Multicore and symmetrical pair/quad cables for broadband digital communications (high bit rate digital access telecommunication networks) – Outside plant cables – Part 3-1: Filled cables – Blank detail specification*

3 Terms and definitions

For the purposes of this document, the 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

The core of the cable shall be filled with a suitable water-blocking material. Examples of suitable materials are:

– polyethylene modified petroleum jelly;
– extended thermoplastic rubber;

– absorbent thixotropic gel;
– superabsorbent polymers with or without a carrier.

The material used shall be compatible with the cable components with which it is in contact.

The type of material shall be indicated in the relevant detail specification.

5.9 Flooding compound

The sheath interfaces shall be filled with a suitable water-blocking material. Examples of suitable materials are:

– polyethylene modified petroleum jelly;
– absorbent thixotropic gel;
– superabsorbent polymers with or without a carrier;
– atactic polypropylene.

The material used shall be compatible with the cable components with which it is in contact.

The type of material shall be indicated in the relevant detail specification.

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 ± 0,5) % by weight carbon black.

5.12 Rip-cord

A rip-cord 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.

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