IEC 62807-3-10

Edition 1.0 2023-02

INTERNATIONAL STANDARD

Hybrid communication cables –
Part 3-10: Outdoor hybrid cables – Family specification for FTTA hybrid communication cables



IEC 62807-3-10:2023-02(en)



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 33.120.20

ISBN 978-2-8322-6526-0

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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HYBRID COMMUNICATION CABLES –

Part 3-10: Outdoor hybrid cables – Family specification for FTTA hybrid communication cables

FOREWORD

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IEC 62807-3-10 has been prepared by subcommittee 46C: Wires and symmetric cables, of IEC technical committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories. It is an International Standard.

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

Draft	Report on voting
46C/1246/FDIS	46C/1251/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.

This part of IEC 62807 is to be used in conjunction with IEC 62807-3:2023. It is based on the first edition of that document.

A list of all parts in the IEC 62807 series, published under the general title *Hybrid communication cables*, can be found on the IEC website.

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- withdrawn,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

HYBRID COMMUNICATION CABLES –

Part 3-10: Outdoor hybrid cables – Family specification for FTTA hybrid communication cables

1 Scope

This part of IEC 62807 is a family specification for FTTA (Fibre-To-The-Antenna) outdoor hybrid communication cables. It specifies the design and construction, rated values and characteristics, requirements and test methods, packaging and quality assurance, etc.

The FTTA hybrid communication cables are typically but not only installed between the Base Band Unit (BBU) and Remote Radio Unit (RRU; or often called RRH – Remote Radio Head or AAU – Active Antenna Unit), and other scenario that supply electric current to optical communication equipment.

The FTTA hybrid communication cables contain optical fibre elements and current carrying elements under a common outer sheath or other constructions unifying the elements. The current carrying elements are used only to supply power to the equipment within the communication network. The current carrying elements are not used for electricity distribution or transmission, nor for power supply to domestic appliances.

The relationship between each of the MICE classifications in ISO/IEC 11801-1, the requirements and test methods of hybrid cables being proposed in a specific application are fully considered and aligned (see Annex A).

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

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

IEC 60228:2004, *Conductors of insulated cables*

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

IEC 60502-1, *Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV) − Part 1: Cables for rated voltages of 1 kV (Um = 1,2 kV) and 3 kV (Um = 3,6 kV)*

IEC 60793-1-40, *Optical fibres – Part 1-40: Attenuation measurement methods*

IEC 60793-1-44, *Optical fibres – Part 1-44: Measurement methods and test procedures – Cut-off wavelength*

IEC 60793-1-46, *Optical fibres – Part 1-46: Measurement methods and test procedures – Monitoring of changes in optical transmittance*

IEC 60793-1-48, *Optical fibres – Part 1-48: Measurement methods and test procedures – Polarization mode dispersion*

IEC 60793-2-10, *Optical fibres – Part 2-10: Product specifications – Sectional specification for category A1 multimode fibres*

IEC 60793-2-50, *Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres*

IEC 60794-1-1, *Optical fibre cables – Part 1-1: Generic specification − General*

IEC 60794-1-21, *Optical fibre cables – Part 1-21: Generic specification – Basic optical cable test procedures – Mechanical test methods*

IEC 60794-1-22, *Optical fibre cables – Part 1-22: Generic specification – Basic optical cable test procedures – Environmental test methods*

IEC 60794-1-31, *Optical fibre cables – Part 1-31: Generic specification – Optical cable elements – Optical fibre ribbon*

IEC 60794-1-403, *Optical fibre cables – Part 1-403: Generic specification – Basic optical cable test procedures – Electrical test methods – Electrical continuity test of cable metallic elements, method H3*

IEC 60794-2, *Optical fibre cables – Part 2: Indoor cables − Sectional specification*

IEC 60794-3:2022, *Optical fibre cables – Part 3: Outdoor cables – Sectional specification*

IEC 62807-3:2023, *Hybrid communication cables – Part 3: Outdoor hybrid cables – Sectional specification*

IEC 62821 (all parts), *Electric cables – Halogen-free, low smoke, thermoplastic insulated and sheathed cables of rated voltages up to and including 450/750 V*

IEC 62821-1, *Electric cables – Halogen-free, low smoke, thermoplastic insulated and sheathed cables of rated voltages up to and including 450/750 V – Part 1: General requirements*

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

ISO/IEC 11801-1:2017, *Information technology – Generic cabling for customer premises – Part 1: General requirements*

3 Terms, definitions, symbols and abbreviated terms

For the purposes of this document, the terms, definitions, symbols and abbreviated terms given in IEC 62807-3, IEC 60794-1-1, IEC 60227-1, IEC 62821-1 and IEC 60502-1 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

4 Design and construction

4.1 General

This hybrid cable is typically composed of optical fibre elements and current carrying elements with strength member, filler, yarn, tape, ripcord, screening and/or shield, moisture barrier, sheath or armouring, etc. The hybrid cable shall be designed to meet the requirements of cable application and operating environment.

Some examples of structures of typical FTTA hybrid cables are shown in Annex B. Annex C describes a blank detail specification for FTTA hybrid cables and incorporates some minimum requirements.

4.2 Optical fibre elements

The optical fibre elements shall be in accordance with the following:

a) The optical fibre elements shall be composed of one or more optical fibres, tight or semi-tight buffered fibres, fibre ribbons, buffer tubes, other optical core structures, or independent optical fibre cables (such as loose tube cable). The construction and number of optical fibre elements shall be specified in the relevant specification.

b) The optical fibres can be single-mode fibres and shall comply with the requirements of IEC 60793-2-50, or may be multi-mode fibres and shall comply with the requirements of IEC 60793-2-10.

c) The tight buffer shall be removable from the fibre for termination. The semi-tight buffer shall be easily removable from the fibre in longer strip lengths than the tight buffer. The tight or semi-tight buffer should be made of thermoplastic material or ultraviolet cured resin.

d) The optical fibre ribbon shall comply with IEC 60794-1-31 or the relevant specification.

e) Optical core structures shall comply with IEC 60794-2 or IEC 60794-3 or the relevant specification.

f) For ease of identification, all the optical fibre and optical fibre elements shall be identified, for example colour coding, ring marking, printing or some other methods agreed between the customer and supplier. If the primary coated fibres are coloured for identification, the coloured coating shall be readily identifiable throughout the lifetime of the cable and the coloured coating shall comply with IEC 60304. Additional information can be found in IEC TR 63194.

g) The material of the optical elements' sheath or loose tube may be polyethylene, polypropylene, polybutylene terephthalate (PBT), low smoke halogen free material, polyvinyl chloride, or other materials suitable to the application.

4.3 Current carrying elements

The design of conductor cross-sections shall be in accordance with the rated voltage, transmission distance and consumed power of the powered device. Under normal operating conditions, the temperature increase caused by the power transmission shall not exceed the maximum conductor temperature of the current carrying elements as specified in Table D.1 of Annex D.

Current carrying elements shall meet the requirements of the appropriate specification before being assembled into hybrid cables. For example, for a rating voltage up to and including 450/750 V, current carrying elements shall meet the requirements of the IEC 60227 series or the IEC 62821 series. For a rating voltage of 0,6/1 kV, the current carrying elements shall meet the requirements of IEC 60502-1.