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TECHNICAL REPORT

colour inside

Guidance for the selection of drop cables

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FOREWORD

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IEC TR 62901, which is a Technical Report, has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
86A/1676/DTR	86A/1707/RVC

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

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

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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- withdrawn,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.

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GUIDANCE FOR THE SELECTION OF DROP CABLES

1 Scope

This Technical Report defines the term "drop cable", describes the application spaces and the performance requirements as a consequence of the different applications. Cable design options which result from specific applications which are not yet described in the existing product specifications will be explained.

This technical report also gives some guidance on cable testing with focused attention on cable performance requirements which are not covered by existing standards yet.

This technical report is not intended to be used as a product standard.

2 Normative references

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

None

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1
drop cables
cables closing the gap between distribution cables (starting at the Network Access Point or NAP) and the single user´s home (Multi Dwelling Units or MDUs), or other premises

Note 1 to entry: Drop cables are deployed in aerial, in duct, direct-buried, on facades as well as indoor/outdoor cables.

Note 2 to entry: Drop cables end either outside the building or inside the building. Therefore, often so-called indoor/outdoor cables are needed to provide the appropriate fire performance.

Note 3 to entry: The Network access point (NAP) or Access Point is connected to the user´s house by aerial drop cables or underground drop cables, as shown in Figure 1.

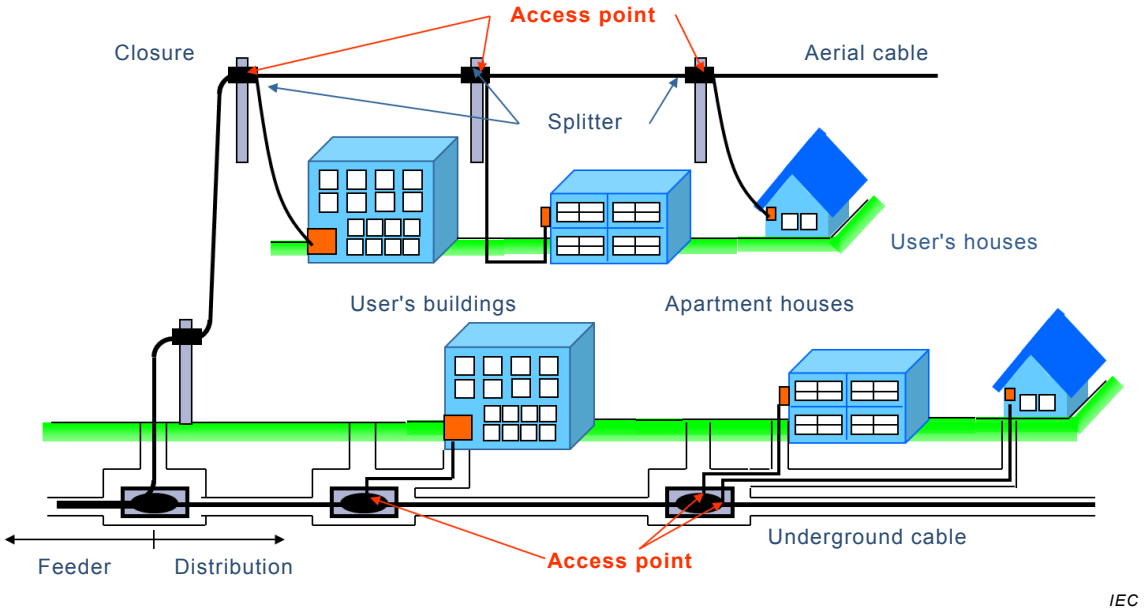

Figure 1 – Configuration of a typical FTTH network

3.2 Abbreviations

ADSS All Dielectric Self-Supporting Cable
ARP Aramid Reenforced Plastic
EFL Excess Fibre Length
FRNC Flame Retardant Non Corrosive
FTTH Fiber To The Home
GRP Glass Fibre Reinforced Plastic
HDPE High Density PE
LDPE Low Density PE
LSZH Low Smoke Zero Halogen
MCC Metal Cable Clamp

NOTE MCC are not made of metal anymore.

MDPE Medium Density PE
NAP Network Access Point
PE Polyethylene
PP Polypropylene
FR Flame Retardant
TB Tight Buffered Fibre or Tight Buffer

4 Application spaces

4.1 General

Clause 4 describes most of the different ways commonly used to connect the end user to the distribution cable.

4.2 Installation between poles

4.2.1 General

In some countries, the installation of fibre optic aerial drop cable is the most preferred option because of the relatively low effort compared to other methods like installation in ducts, direct burying, etc. Especially when the distribution cable has been installed between poles, it is common practice to also use an aerial installation for the last few meters from the NAP to the building. The connection to the NAP can either be done by splicing individual fibres to the NAP, or using field-installable connectors, or using preconnectorized cables when the NAP is designed to access the branched fibres via already installed connectors. Normally, only lower fibre counts (e.g. 1 to 8 optical fibres) are required. The distances are short (typically between 20 m and 100 m), thus the span lengths between the poles are also short (15 m to 50 m). Depending on the preferred installation method, fibre optical cables can be installed as self-supporting cables, lashed cables or suspended cables.

Even though the span length is short, ice and wind loads have to be taken into account especially when stringent sag requirements are to be fulfilled.

Cables with a black sheath are typically used for outdoor installations. The black colour is the result of the addition of "carbon black". A concentration of approximately 2,5 % ensures the long term stability against UV radiation. When other sheath colours are used (e.g. for a better appearance) UV stabilizers have to be added. The functionality of those stabilizers has to be demonstrated by appropriate test procedures.

4.2.2 Self-supporting cables

A self-supporting cable contains all required strain carrying elements; thus it can be directly fixed to the poles with the appropriate equipment. A widely used method which is also appropriate for the installation of long length self-supporting cables is the use of metallic spirals (dead ends, see Figure 2).

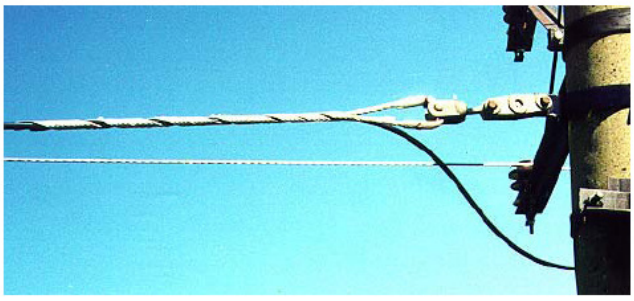

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Figure 2 – Dead ends to be used for the installation of long length self-supporting cables

For shorter length of cable, lower tension cable clamps can be used (see Figure 3, Figure 4 and Figure 5). More examples of commonly used clamp systems are shown in Annex C.

Self-supporting cables can contain metallic strength members which may need to have a good connection to ground. ADSS cables (see also IEC 60794-3-20) do not need this precaution.

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Figure 3 – P-clamp

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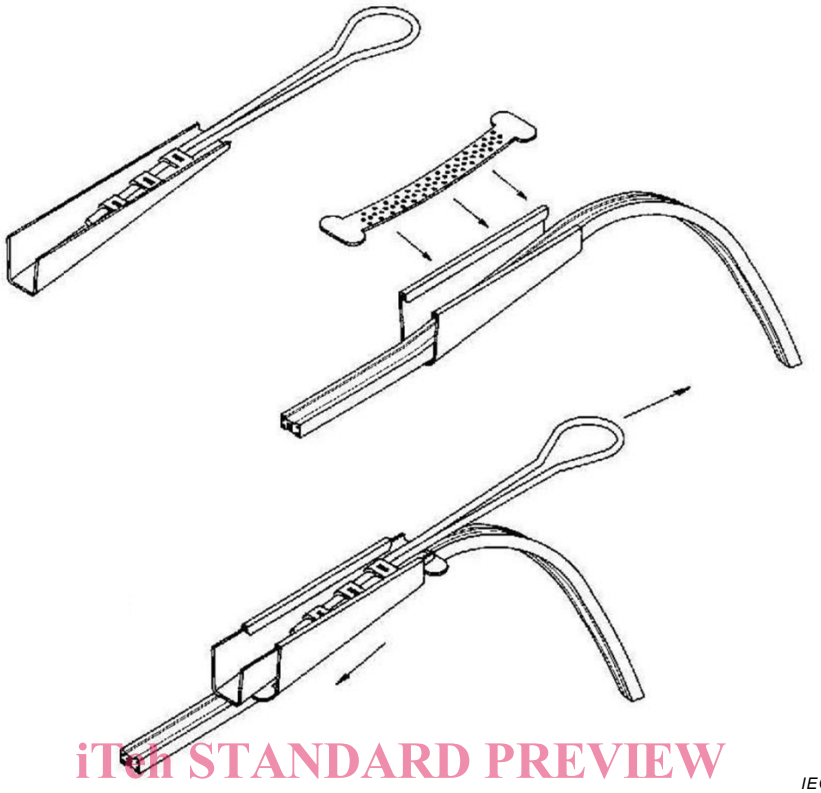
Left: open

Right: closed

Figure 4 – MCC



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NOTE A wedge clamp is a clamp with one end contacting the cable below its surface and the other end butting against a crosspiece so that the tightening of a bolt passing through its center causes the clamp to wedge the cable in position.

Figure 5 – Wedge clamp

4.2.3 Lashed and suspended cables

Lashed cables do not represent a specific class of cables. Almost all outdoor cable designs can be installed by that "lashing" technique. A prerequisite is a so-called messenger wire which needs to be installed up-front between the poles. The cable will be attached to the messenger wire by either winding a "band" or thread made of a metal or a dielectric material helically around the messenger and fibre optic cable. The winding process can be done with the help of a machine pulled from the ground or automatically driven by a motor (see Figure 6).

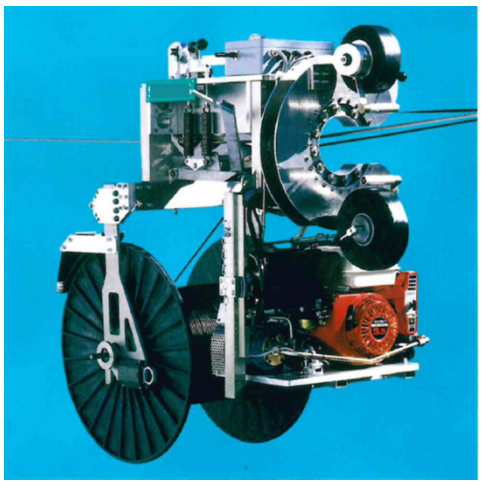

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Figure 6 – Motor-driven lash machine