



Edition 1.0 2016-03

TECHNICAL REPORT



Guidance for the selection of drop cables

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 33.180.10 ISBN 978-2-8322-3235-4

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FC	REWO	RD	.5
1	Scop	e	.7
2	Norm	ative references	.7
3	Term	s, definitions and abbreviations	.7
	3.1	Terms and definitions	.7
	3.2	Abbreviations	
4	Appli	cation spaces	.8
	4.1	General	.8
	4.2	Installation between poles	
	4.2.1	General	
	4.2.2	Self-supporting cables	.9
	4.2.3	Lashed and suspended cables1	1
	4.3	Installation in ducts	2
	4.4	Installation in sewer, water and gas pipes1	2
	4.5	Direct-buried cables	2
	4.6	Installation on facades	3
5	Insta	llation options1	4
	5.1	General1	4
	5.2	Installation between poles	4
	5.2.1	General1	4
	5.2.2	Self-supporting cables1	4
	5.2.3	Lashed cables1	6
	5.2.4	Suspended cables1	
	5.3	Cables in ducts	
	5.3.1	General1	
	5.3.2	3	
	5.3.3	Jetting1	
	5.3.4	Blowing1	
	5.3.5	Pushing	
	5.4	Installation in sewer, water and gas pipes	
	5.4.1	General	
	5.4.2		
	5.5	Direct-buried cables	
	5.6	Installation on facades	
	5.6.1	General	
6	5.6.2	Specific installation options1	
6			
	6.1	General	
	6.2	Standard test procedures	
	6.3 6.3.1	Additional test methods	
	6.3.1		y
	0.3.2	rough surface1	9
	6.3.3	Tensioning performance test	
7		ples of commonly used drop cable designs2	
	7.1	General2	

7.2 Designs to be used for the installation between poles	20
7.2.1 Self-supporting cables	20
7.2.2 Lashed and suspended cables	25
7.3 Designs to be used for the installation in ducts	
7.4 Designs to be used for the installation in sewer, water and gas pipes	
7.5 Designs to be used for direct-buried cables	
7.6 Designs to be used for the installation at facades	
Annex A (informative) Installation of fibre optic drop cables along facades	
A.1 Method 1: Tensioning the cable using clamps between anchors	
A.2 Method 2: Attaching the cable with using crimps on the wall	
A.4 Method 4: Using of alternative routes through the restricted space of	
windows and doors Annex B (informative) Estimation of the pushing length	
Annex C (informative) Additional clamp types for optical drop cables	
Bibliography	30
Figure 1 – Configuration of a typical FTTH network	8
Figure 2 – Dead ends to be used for the installation of long length self-supporting cables	9
Figure 3 – P-clamp	10
Figure 4 – MCC	10
Figure 5 – Wedge clamp	11
Figure 6 – Motor-driven lash machine	
Figure 7 – Crimp used to fix a cable to the messenger wire	
Figure 8 – Tape armored cable	
Figure 9 – Puncture-free installation of drop cable	
Figure 10 – Attack of drop cables by cicada	
Figure 11 – Tensioning performance test set-up	
Figure 12 – Self-supporting dielectric aerial cable	
Figure 13 – Stranded self-supporting dielectric aerial cable	
Figure 14 – Self-supporting aerial cable with non concentrically- arranged strength	
members	22
Figure 15 – Flat self-supporting aerial cable with strength members on both sides	23
Figure 16 – Rectangular design with one integrated messenger wire and strength members	
Figure 17 – Indoor / outdoor aerial drop cable with removable sheath	
Figure 18 – Lashed cable	
Figure 19 – Cables suitables for pushing	
Figure 20 – Robust direct-buried cable with low diameter	
Figure 21 – Facade cables	
Figure C.1 – Droplet type clamp	
Figure C.2 – Fish type clamp	
Figure C.3 – P-clamp	
Figure C.4 – Wedge type clamp	35

Table 1 – Self-supporting dielectric aerial cables	21
Table 2 – Stranded self-supporting dielectric aerial cables	22
Table 3 – Self-supporting cable with non concentrically-arranged strength members	22
Table 4 – Flat self-supporting aerial cable with strength members on both sides	23
Table 5 – Rectangular design with one integrated messenger wire and strength member	24
Table 6 – Indoor / outdoor aerial drop cable with removable sheath	25
Table 7 – Lashed cable	25
Table 8 – Designs to be used for the installation in ducts	27
Table 9 – Robust direct-buried cable with low diameter	28
Table 10 – Designs to be used for the installation at facades	30
Table 11 – Facade cable for fibre counts up to 4 fibres	30

INTERNATIONAL ELECTROTECHNICAL COMMISSION

GUIDANCE FOR THE SELECTION OF DROP CABLES

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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 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.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a Technical Report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

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.

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication 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.

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