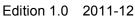
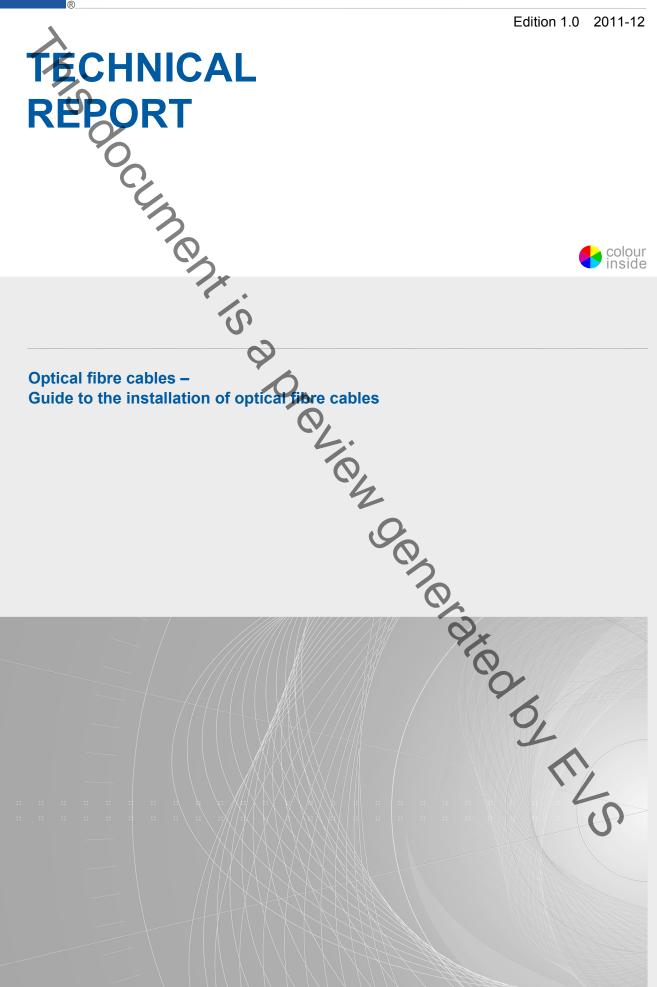


EC/TR 62691:2011(E)

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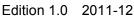
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# CONTENTS

FO	REWO	RD		4			
1	Scope	<u>e</u>		6			
2	Normative references						
2			lanning				
3			0				
	3.1		tion specification				
	3.2		considerations				
	3.3		nstallation tension considerations				
	3.4		ension predictions – duct installations				
	3.5		um cable tension				
		3.5.1	General				
		3.5.2	Total cable tension – pulling applications				
		3.5.3	Total cable tension – pushing, blowing, or pulling applications				
	3.6		tion temperature				
	3.7	Informa	ation and training	.10			
4							
	4.1		al considerations.				
	4.2		in confined spaces				
	4.3		tallation procedures				
	4.4		tion of optical cables in underground ducts				
		4.4.1	Application				
		4.4.2	Installation using trenchless technique				
		4.4.3	Cable overload protection methods				
		4.4.4	Cable bending and guiding systems				
		4.4.5	Winching equipment and ropes				
		4.4.6	Cable friction and lubrication				
		4.4.7	Cable handling methods to maximise installed lengths				
		4.4.8	Jointing length allowance				
		4.4.9	Blowing techniques for the installation of fiber optic cables into ducts				
			Optical fibre cable installation by floating technique				
	4.5		tion of aerial optical cables				
		4.5.1	Application	. 20			
		4.5.2					
		4.5.3 4.5.4	Cable protection methods				
		4.5.4	Winching and guiding systems Methods to maximise lengths				
		4.5.6	Jointing length allowance				
		4.5.7		.21			
	4.6		tion of buried cable				
	4.0	4.6.1	Installation methods				
		4.6.2	Cables in trenches	-			
		4.6.3	Installing cables by ploughing				
		4.6.4	Methods to maximise lengths				
		4.6.5	Jointing length allowance				
	4.7		ition in special situations				
	4.1	4.7.1	Tunnel and building lead-in				
		4.7.1	Bridges				
		<del>+</del> .1.2	Dingeo	. 24			

	4.7.3	Underwater	24
	4.7.4	Storm and sanitary sewers	24
<b>\</b>	4.7.5	High pressure gas pipes	24
	4.7.6	Drinking water pipes	24
0	4.7.7	Industrial environments	25
4.8	Installa	ition of indoor cables	25
	4.8.1	General considerations	25
	4.8.2	Cable routing	25
		Confined spaces	
4.9		systems	
	4.9.1	Ceneral considerations	
	4.9.2	Installation of cables in the vertical riser area of buildings	
	4.9.3	Tube installation	
	4.9.4	Fibre and cable installation	
		ocation	
5 Ligł	htning pro	tection	
Bibliogr	aphy		
		0,	
Figure <sup>2</sup>	1 – Cable	tension calculations (equations. 1 through 3)	10
Figure 2	2 – Cable	tension calculations (equations. 4 through 9)	12
-		tension calculations; Series1 = blowing; Series2 = pushing;	
Figure 4	4 – Optica	al fibre cabling in an underground duct	
Figure {	5 – Aerial	cable installation	
Figure 6	6 – Cable	installation by cascade blowing	28
rigure (		Installation by cascade blowing and	
<del>.</del>	<u> </u>		10
		ation for total tension	
Table 2	– Calcula	ation for pulling force in Figure 2	
Table 3	<ul> <li>Calcula</li> </ul>	ation for pushing force in Figure 2	13
Table 4	<ul> <li>Calcula</li> </ul>	ation for blowing force in Figure 2	14
Table 5	– Minimu	Im installation depths	23
		N.	
		YX.	
		Č.	
			<b>K</b>
			1
		im installation depths	
			0,

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### **OPTICAL FIBRE CABLES –**

# Guide to the installation of optical fibre cables

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IEC 62691, 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/1415/DTR	86A/1426/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 web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
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amended

• replaced by a revised edition, or

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### **OPTICAL FIBRE CABLES –**

# Guide to the installation of optical fibre cables



Optical fibre cabling provides a high performance communications pathway whose characteristics can be degraded by inadequate installation. This technical report provides guidance to assist the user and installer with regard to the general aspects of the installation of optical fibre cables covered by the IEC 60794 series of specifications, and the particular aspects of the 'blowing' technique.

Optical fibre cables are designed so that normal installation practices and equipment can be used wherever possible. They do, however, generally have a strain limit rather lower than metallic conductor cables and, in some circumstances, special care and arrangements may be needed to ensure successful installation.

It is important to pay particular attention to the cable manufacturer's recommendations and stated physical limitations and not exceed the given cable tensile load rating for a particular cable. Damage caused by overloading during installation may not be immediately apparent but can lead to failure later in its service life.

This guide does not supersede the additional relevant standards and requirements applicable to certain hazardous environments, e.g. electricity supply and railways.

### 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.

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

IEC 60794-3-40, Optical fibre cables – Part 3-40: Outdoor cables – Family specification for sewer cables and conduits for installation by blowing and/or pulling in non-man accessible storm and sanitary sewers

IEC 60794-3-50, Optical fibre cables – Part 3-50: Outdoor cables – Family specification for gas pipe cables and subducts for installation by blowing and/or pulling/dragging in gas pipes

IEC 60794-3-60, Optical fibre cables – Part 3-60: Outdoor cables – Family specification for drinking water pipe cables and subducts for installation by blowing and/or pulling/dragging/floating in drinking water pipes

IEC/TR 62362, Selection of optical fibre cable specifications relative to mechanical, ingress, climatic or electromagnetic characteristics – Guidance

IEC/TR 62470, Guidance on techniques for the measurement of the Coefficient Of Friction (COF) between cables and ducts

ISO/IEC 24702, Information technology – Generic cabling – Industrial premises

ISO/IEC TR 29106, Information technology – Generic cabling – Introduction to the MICE environmental classification

ITU Recommendation K.25, *Protection of optical fibre cables* 

ITU-T Recommendation L.35, Installation of optical fibre cables in the access network

ITU-T Recommendation L.38, Use of trenchless techniques for the construction of underground infrastructures for telecommunication cable installation

ITU-T Recommendation L.57, Air-assisted installation of optical fibre cables

ITU-T Recommendation L.61, Optical fibre cable installation by floating technique

ITU-T Recommendation 1, 77, Installation of optical fibre cables inside sewer ducts

### 3 Installation planning

### 3.1 Installation specification

The successful installation of an optical fibre cable can be influenced significantly by careful planning and assisted by the preparation of an installation specification by the user. The installation specification should address the cabling infrastructure, cable routes, potential hazards and installation environment and provide a bill of materials and technical requirements for cables, connectors and closures.

The installation specification should also detail any civil works, route preparation (including drawpits, ductwork, traywork and trunking) and surveying that are necessary, together with a clear indication of responsibilities and contractual interfaces, especially if there are any site or access limitations.

Post installation requirements for reinstatement, spares ancillary services and regulatory issues should also be addressed.

#### 3.2 Route considerations

Whilst optical fibre cables are lighter and installed in longer lengths than conventional metallic cables, the same basic route considerations apply.

Route planning and cable handling methods must carefully take into account the specified minimum bending radius and maximum tensile loading of the particular optical fibre cable being installed so that fibre damage, giving rise to latent faults, can be avoided.

Some of the most difficult situations for the installation of optical fibre cables are in underground ducts and the condition and geometry of duct routes is of great importance. Where the infrastructure includes ducts in poor condition, excessive curvature, or ducts already containing cables or access points with abrupt changes of direction, the maximum pull distance will be reduced accordingly.

Provision of long cable lengths in underground duct or aerial situations may involve installation methods that require access to the cable at intermediate points for additional winching or blowing effort, or "figure 8" techniques, these sites should be chosen with care. Consideration should also be given to factors of time and disturbance. Installation equipment may be required to run for long periods of time and the time of day, noise levels, and vehicular traffic disruption should be taken into account.