Belden

BELOPTIX®

European Edition

Optical Fibre Cables

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General Information

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Belden Quality

Belden guarantees, that all supplied optical fibre cables have been comprehensively tested. A Statistical Process Analysis ensures the maintenance of the specifications. With the use of the most up-to-date process controls the stability of all optical and mechanical values can be guaranteed. All Belden development and engineering departments, production facilities and sales offices for optical fibre cables are certified according to ISO 9001 and ISO 14001.

Product Variety

If you do not find the product you need in this catalogue, we offer the option of special (custom made) cables. Here you can choose between different constructions, mixed fibre types, jacket colours, private labelling, etc.

15 Year Warranty

Our customers trust in the quality of Belden products. To ensure the customer that this quality will remain constant even after years, Belden offers standard a 15 year warranty on all optical fibre cables. This implies the maintenance of all technical performances within this period.

Life-Time

As all fibres show surface imperfections, Belden uses exclusively fibres with proof test-level ≥ 8.8 N / ≥ 1 % = ≥ 100 kpsi. Therefore the expected lifetime of our optical fibre cables is > 30 years.

Optical Transmission

Belden only uses fibres of world-wide renowned fibres-manufacturers.
This enables us to give the already mentioned guarantees on life-time and performance. By Belden specified data for attenuation and dispersion respectively bandwidth concerns the cabled optical fibres. Of every standard production length the attenuation (MM fibres at 1300 nm, SM fibres at 1310 nm and 1550 nm) are measured. The respective test report is attached to the reel.

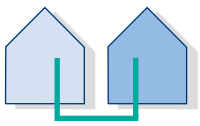
Metal-free Cables

Almost all optical fibre cables of Belden, especially for datacom, are metal-free. Consequently these cables are immune to lightning and electromagnetic interference (EMC-safe), spark-free and require no earthing.

Dry Multi-tube Cables

To guarantee longitudinal watertightness according to IEC 60793-1-2-F5 we use swellable yarns and/or tapes. No aquagel is used between the tubes. For functional reasons we only use jelly filled (non dripping and silicon-free) loose tubes.
Legend: **dc** = dry cable

Outdoor & Indoor = Universal



Internal & External = Intex

Universal possibilities of installation.
Belden's universal and intex cables unite a unique combination of construction and performance attributes that make them ideal for both outdoor & indoor use. Consequently splicing can be avoided going from outdoor into indoor use.

Halogen-free Cables

Our halogen-free optical fibre cables meet the most important international standards. Moreover Belden selected halogen-free jacketing materials suitable for outdoor use like direct burial.

Material:	HD 624.7
Flame Retardancy:	
– Loose tube cables:	IEC 60332-3C
– Tight buffered cables:	IEC 60332-1 or 2
Corrosivity:	IEC 60754-2 (HD 602, BS 6425.2)
Low Smoke:	ASTM E662
Toxicity:	NES 713 (HD 605, BS 6425.1)
UV-resistance:	ISO 4892-2

In comparison to products containing halogens (like PVC), these halogen-free materials offers considerable advantages in case of a fire:
Less impairment to vision, minimal poisonous gases, no release of highly caustic acids, more safety for man, nature and materials.
Legend:
FRNC = Flame Retardant, Non Corrosive
LSNH = Low Smoke, Non Halogen.
Belden's halogen-free optical fibre cables are both FRNC and LSNH according to above mentioned standards.

Functionality

We set great value on the construction of our optical fibre cables to achieve the best results with a compact design for limited duct space and for excellent watertightness. Our cables are as thin as can be, very light and therefore easier to install.

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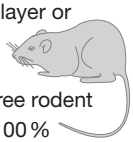
Rodent Protection

In almost all our optical fibre cables we are making use of glass reinforced yarns as strength members. These yarns also take care for a standard protection against rodents. We also offer cables with improved rodent protection by means of extra glass reinforced yarns or an extra layer of Nylon (polyamide). The idea behind this is that rodents – as every creature in nature – will look for (the pass of) least resistance. So apart from very exclusive situations, rodents will bite everywhere (to keep their teeth in proper shape) but only continue if they feel comfortable. In case of a nylon layer or "glass" yarns they will normally stop and continue somewhere else. Please note that a metal-free rodent protection never guarantees a 100 % protection against rodents.



Optical Fibre-Types as specified in ISO/IEC 11801

Optical Fibre-type	Core diameter in µm	Bandwidth in MHz x km 850/1300 nm	Gigabit Ethernet	GbE performance in m 850/1300 nm
OM1	50 or 62.5	200/500	1 GbE	220/550
OM2	50 or 62.5	500/500	1 GbE	550/550
OM3	50	1500/500	10 GbE (serial)	300/not specified
OS 1	Single-Mode fibre			

Source: ISO/IEC 11801 2nd edition — 2001-10-10

Optical Fibre-type	Belden standard fibres	1 GbE performance in m 850/1300 nm	10 GbE performance in m 850 nm
OM1	62.5/125 (200/600 MHz x km)	275/550	33
OM2	50/125 (600/1200 MHz x km)	550/550	82
OM2e	50/125 (600/1200 MHz x km)	750/2000	110
OM3	50/125 (1500/500 MHz x km)	900/550	300
OS 1	Single-Mode fibre according to ITU-G.652B		

Characteristics (cabled) Single-Mode optical fibres according to ITU-G.655

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation (dB/km) average/max.	Non-zero dispersion range 1530 – 1565 nm (ps/(nm x km))	PMD Link design value (ps/√km)	Refractive Index
8/125	8.4 ± 0.6 125 ± 1	1550	0.25/0.28	3.5 ≤ D ≤ 8.5	≤ 0.1	1.470

Belden Manufacturing

Every Belden Optical Fibre Cable is based on Belden's philosophy of reliability and performance. All Belden Optical Fibre Cables for the European market are exclusively manufactured in the Netherlands (Venlo).

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Intex-, Indoor and Mobile Cables • Optical Fibre Cables with tight buffered fibres

Cable-type (pages in catalog)	Fibre-count	Jacket	Fibre-type					Std. Del.-length	Datasheet
			SM 9/125 OS1	MM 50/125 OM2	MM 50/125 OM2e	MM 50/125 OM3	MM 62.5/125 OM1		
Intex Mini-Breakout with standard Rodent Protection	4	FRNC	GUMT904	GUMT204	GUMT404	GUMT304	GUMT104	2100	Intex Mini-BO
	6	FRNC	GUMT906	GUMT206	GUMT406	GUMT306	GUMT106	2100	
	8	FRNC	GUMT908	GUMT208	GUMT408	GUMT308	GUMT108	2100	
	12	FRNC	GUMT912	GUMT212	GUMT412	GUMT312	GUMT112	2100	
page 17 and 18	24	FRNC	GUMT924	GUMT224	GUMT424	GUMT324	GUMT124	2100	
Intex Mini-Breakout with improved Rodent Protection	4	FRNC	GUXT904	GUXT204	GUXT404	GUXT304	GUXT104	2100	Intex Mini-BO HR
	6	FRNC	GUXT906	GUXT206	GUXT406	GUXT306	GUXT106	2100	
	8	FRNC	GUXT908	GUXT208	GUXT408	GUXT308	GUXT108	2100	
	12	FRNC	GUXT912	GUXT212	GUXT412	GUXT312	GUXT112	2100	
(not listed in catalog)	24	FRNC	GUXT924	GUXT224	GUXT424	GUXT324	GUXT124	2100	
Indoor Mini-Breakout with dry semi-tight buffered fibres	2	FRNC		GIMK202	GIMK402	GIMK302	GIMK102	2100	
	4	FRNC		GIMK204	GIMK404	GIMK304	GIMK104	2100	
(not listed in catalog)	8	FRNC		GIMK208	GIMK408	GIMK308	GIMK108	2100	
Indoor Mini-Breakout with tight buffered fibres	2	FRNC		GIMT202	GIMT402	GIMT302	GIMT102	2100	Mini-BO
	2	FRNC		YE00051			YE00056	2100	
	4	FRNC		GIMT204	GIMT404	GIMT304	GIMT104	2100	
	6	FRNC		GIMT206	GIMT406	GIMT306	GIMT106	2100	
	8	FRNC		GIMT208	GIMT408	GIMT308	GIMT108	2100	
	12	FRNC		GIMT212	GIMT412	GIMT312	GIMT112	2100	
	16	FRNC		GIMT216	GIMT416	GIMT316	GIMT116	2100	
page 19 and 20	24	FRNC		GIMT224	GIMT424	GIMT324	GIMT124	2100	
Indoor Breakout with dry semi-tight buffered fibres	2 (Flat)	FRNC	GIBK902	GIBK202	GIBK402	GIBK302	GIBK102	2100	
	4	FRNC	GIBK904	GIBK204	GIBK404	GIBK304	GIBK104	2100	
	6	FRNC	GIBK906	GIBK206	GIBK406	GIBK306	GIBK106	2100	
	8	FRNC	GIBK908	GIBK208	GIBK408	GIBK308	GIBK108	2100	
(not listed in catalog)	12	FRNC	GIBK912	GIBK212	GIBK412	GIBK312	GIBK112	2100	
Indoor Breakout with tight buffered fibres	2	FRNC	GIBT902	GIBT202	GIBT402	GIBT302	GIBT102	2100	Breakout cables
	4	FRNC	GIBT904	GIBT204	GIBT404	GIBT304	GIBT104	2100	
	6	FRNC	GIBT906	GIBT206	GIBT406	GIBT306	GIBT106	2100	
	8	FRNC	GIBT908	GIBT208	GIBT408	GIBT308	GIBT108	2100	
	12	FRNC	GIBT912	GIBT212	GIBT412	GIBT312	GIBT112	2100	
page 21 and 22	24	FRNC	GIBT924	GIBT224	GIBT424	GIBT324	GIBT124	2100	
Duplex Fig. 8	2	FRNC	GIPS902	GIPS202	GIPS402	GIPS302	GIPS102	2100	Duplex 2.8 mm
page 23 and 24	2	FRNC	GIPT902	GIPT202	GIPT402	GIPT302	GIPT102	2100	MiniZip 1.6 – 1.8 mm
Simplex 2.8 mm	1	FRNC	YE00126					2100	Simplex ST
	1	FRNC	YE00023				YE00045	2100	
	1	FRNC	GIPS901	GIPS201	GIPS401	GIPS301	GIPS101	2100	
	1	FRNC	YE00026					2100	Simplex-DST
page 23 and 24	1	FRNC	YE00024					2100	
Pigtails	1	TPE	GIOK901	GIOK201	GIOK401	GIOK301	GIOK101	2100	Pigtails
	1	TPE	YE00021	YE00039				2100	
page 25	1	PA	YE00020					2100	
Mobile cables	4	PUR	GMMT904	GMMT204	GMMT404	GMMT304	GMMT104	2100	Mobile cables
	6	PUR	GMMT906	GMMT206	GMMT406	GMMT306	GMMT106	2100	
page 26	8	PUR	GMMT908	GMMT208	GMMT408	GMMT308	GMMT108	2100	
Breakout Kit (not listed in catalog)	0	PUR	GUPT000 (49399)					2100	Breakout Kit
Duplex APF (not listed in catalog)	2	PVC						350	APF Duplex

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Universal- and Outdoor Cables • Optical Fibre Cables with loose tubes

Cable-type (pages in catalog)	Fibre-count		Fibre-type					Std. Del.-length	Datasheet
			SM 9/125 OS1	MM 50/125 OM2	MM 50/125 OM2e	MM 50/125 OM3	MM 62.5/125 OM1		
Universal Multi-tube cables	12	6*2	GUSC912	GUSC212	GUSC412	GUSC312	GUSC112	4100	
	24	6*4	GUSC924	GUSC224	GUSC424	GUSC324	GUSC124	4100	
	36	6*6	GUSC936	GUSC236	GUSC436	GUSC336	GUSC136	4100	
	48	6*8	GUSC948	GUSC248	GUSC448	GUSC348	GUSC148	4100	
	24	2*12	GUSD924	GUSD224	GUSD424	GUSD324	GUSD124	2100	
	36	3*12	GUSD936	GUSD236	GUSD436	GUSD336	GUSD136	2100	Type-xxdcNH
	48	4*12	GUSD948	GUSD248	GUSD448	GUSD348	GUSD148	2100	
	60	5*12	GUSD960	GUSD260	GUSD460	GUSD360	GUSD160	2100	
	72	6*12	GUSD972	GUSD272	GUSD472	GUSD372	GUSD172	2100	
	96	8*12	GUSE996	GUSE296	GUSE496	GUSE396	GUSE196	2100	
page 7 and 8	144	12*12	GUSF944	GUSF244	GUSF444	GUSF344	GUSF144	2100	
Universal Multi-tube cables with improved Rodent Protection	24	2*12	GURD924	GURD224	GURD424	GURD324	GURD124	2100	
	36	3*12	GURD936	GURD236	GURD436	GURD336	GURD136	2100	
	48	4*12	GURD948	GURD248	GURD448	GURD348	GURD148	2100	Type-xxdcHR
	60	5*12	GURD960	GURD260	GURD460	GURD360	GURD160	2100	
page 7 and 8	72	6*12	GURD972	GURD272	GURD472	GURD3272	GURD172	2100	
Universal Central tube (4.2 mm) cables	4	1*4	GUSB904	GUSB204	GUSB404	GUSB304	GUSB104	2100	
	6	1*6	GUSB906	GUSB206	GUSB406	GUSB306	GUSB106	2100	
	8	1*8	GUSB908	GUSB208	GUSB408	GUSB308	GUSB108	2100	Type-24NH
	12	1*12	GUSB912	GUSB212	GUSB412	GUSB312	GUSB112	2100	
	16	1*16	GUSB916	GUSB216	GUSB416	GUSB316	GUSB116	2100	
page 9 and 10	24	1*24	GUSB924	GUSB224	GUSB424	GUSB324	GUSB124	2100	
Universal Central tube (4.2 mm) cables with improved Rodent Protection	4	1*4	GURB904	GURB204	GURB404	GURB304	GURB104	2100	
	6	1*6	GURB906	GURB206	GURB406	GURB306	GURB106	2100	
	8	1*8	GURB908	GURB208	GURB408	GURB308	GURB108	2100	Type-24HR
	12	1*12	GURB912	GURB212	GURB412	GURB312	GURB112	2100	
	16	1*16	GURB916	GURB216	GURB416	GURB316	GURB116	2100	
page 9 and 10	24	1*24	GURB924	GURB224	GURB424	GURB324	GURB124	2100	
Universal Central tube (3.2 mm) cables	2	1*2	GUSA902	GUSA202	GUSA402	GUSA302	GUSA102	4100	
	4	1*4	GUSA904	GUSA204	GUSA404	GUSA304	GUSA104	4100	
	6	1*6	GUSA906	GUSA206	GUSA406	GUSA306	GUSA106	4100	Type-12NH
	8	1*8	GUSA908	GUSA208	GUSA408	GUSA308	GUSA108	4100	
page 11 and 12	12	1*12	GUSA912	GUSA212	GUSA412	GUSA312	GUSA112	4100	
Universal Central tube (3.2 mm) cables with improved Rodent Protection	2	1*2	GURA902	GURA202	GURA402	GURA302	GURA102	4100	
	4	1*4	GURA904	GURA204	GURA404	GURA304	GURA104	4100	
	6	1*6	GURA906	GURA206	GURA406	GURA306	GURA106	4100	Type-12HR
	8	1*8	GURA908	GURA208	GURA408	GURA308	GURA108	4100	
page 11 and 12	12	1*12	GURA912	GURA212	GURA412	GURA312	GURA112	4100	
Outdoor Multi-tube cables	12	6*2	GOSC912	GOSC212	GOSC412	GOSC312	GOSC112	4100	
	24	6*4	GOSC924	GOSC224	GOSC424	GOSC324	GOSC124	4100	
	36	6*6	GOSC936	GOSC236	GOSC436	GOSC336	GOSC136	4100	
	48	6*8	GOSC948	GOSC248	GOSC448	GOSC348	GOSC148	4100	
	24	2*12	GOSD924	GOSD224	GOSD424	GOSD324	GOSD124	2100	
	36	3*12	GOSD936	GOSD236	GOSD436	GOSD336	GOSD136	2100	
	48	4*12	GOSD948	GOSD248	GOSD448	GOSD348	GOSD148	2100	Type-xxdcPE
	60	5*12	GOSD960	GOSD260	GOSD460	GOSD360	GOSD160	2100	
	72	6*12	GOSD972	GOSD272	GOSD472	GOSD372	GOSD172	2100	
	96	8*12	GOSE996	GOSE296	GOSE496	GOSE396	GOSE196	2100	
	96	12*8	YE00001					2100	
page 13 and 14	144	12*12	GOSF944	GOSF244	GOSF444	GOSF344	GOSF144	2100	
Outdoor Multi-tube cables with improved Rodent Protection	12	6*2	GORC912	GORC212	GORC412	GORC312	GORC112	4100	
	24	6*4	GORC924	GORC224	GORC424	GORC324	GORC124	4100	
	36	6*6	GORC936	GORC236	GORC436	GORC336	GORC136	4100	
	48	6*8	GORC948	GORC248	GORC448	GORC348	GORC148	4100	
	24	2*12	GORD924	GORD224	GORD424	GORD324	GORD124	2100	
	36	3*12	GORD936	GORD236	GORD436	GORD336	GORD136	2100	Type-xxdcRP
	48	4*12	GORD948	GORD248	GORD448	GORD348	GORD148	2100	
	60	5*12	GORD960	GORD260	GORD460	GORD360	GORD160	2100	
	72	6*12	GORD972	GORD272	GORD472	GORD372	GORD172	2100	
	96	8*12	GORE996	GORE296	GORE496	GORE396	GORE196		
page 13 and 14	144	12*12	GORF944	GORF244	GORF444	GORF344	GORF144	2100	
Outdoor Central tube (4.2 mm) cables	4	1*4	GOSB904	GOSB204	GOSB404	GOSB304	GOSB104	2100	
	6	1*6	GOSB906	GOSB206	GOSB406	GOSB306	GOSB106	2100	
	8	1*8	GOSB908	GOSB208	GOSB408	GOSB308	GOSB108	2100	Type-24PE
	12	1*12	GOSB912	GOSB212	GOSB412	GOSB312	GOSB112	2100	
	16	1*16	GOSB916	GOSB216	GOSB416	GOSB316	GOSB116	2100	
page 15 and 16	24	1*24	GOSB924	GOSB224	GOSB424	GOSB324	GOSB124	2100	

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Universal- and Outdoor Cables • Optical Fibre Cables with loose tubes

Cable-type (pages in catalog)	Fibre-count		Fibre-type SM 9/125 OS1	MM 50/125 OM2	MM 50/125 OM2e	MM 50/125 OM3	MM 62.5/125 OM1	Std. Del.-length	Datasheet
Outdoor **Central tube (4.2 mm) cables** with improved Rodent Protection **Bluelight**	2	1*2	GORB902	GORB202	GORB402	GORB302	GORB102	2100	Type-24RP
	4	1*4	GORB904	GORB204	GORB404	GORB304	GORB104	2100	
	6	1*6	GORB906	GORB206	GORB406	GORB306	GORB106	2100	
	8	1*8	GORB908	GORB208	GORB408	GORB308	GORB108	2100	
	12	1*12	GORB912	GORB212	GORB412	GORB312	GORB112	2100	
	16	1*16	GORB916	GORB216	GORB416	GORB316	GORB116	2100	
page 15 and 16	24	1*24	GORB924	GORB224	GORB424	GORB324	GORB124	2100	
Outdoor **Central tube (3.2 mm) cables**	2	1*2	GOSA902	GOSA202	GOSA402	GOSA302	GOSA102	4100	Type-12PE
	4	1*4	GOSA904	GOSA204	GOSA404	GOSA304	GOSA104	4100	
	6	1*6	GOSA906	GOSA206	GOSA406	GOSA306	GOSA106	4100	
	8	1*8	GOSA908	GOSA208	GOSA408	GOSA308	GOSA108	4100	
(not listed in catalog)	12	1*12	GOSA912	GOSA212	GOSA412	GOSA312	GOSA112	4100	
Outdoor **Central tube (3.2 mm) cables** with improved Rodent Protection	2	1*2	GORA902	GORA202	GORA402	GORA302	GORA102	4100	Type-12RP
	4	1*4	GORA904	GORA204	GORA404	GORA304	GORA104	4100	
	6	1*6	GORA906	GORA206	GORA406	GORA306	GORA106	4100	
	8	1*8	GORA908	GORA208	GORA408	GORA308	GORA108	4100	
(not listed in catalog)	12	1*12	GORA912	GORA212	GORA412	GORA312	GORA112	4100	
Aerial cables	6	6*1	GASC906	GASC206	GASC406	GASC306	GASC106	2100	Type-36aerialPE
	12	6*2	GASC912	GASC212	GASC412	GASC312	GASC112	2100	
	24	6*4	GASC924	GASC224	GASC424	GASC324	GASC124	2100	
(not listed in catalog)	36	6*6	GASC936	GASC236	GASC436	GASC336	GASC136	2100	
Universal **Central tube cables** with **Steel Wire Armouring**	4	1*4	GUWA904	GUWA204	GUWA404	GUWA304	GUWA104	4100	Type-xxLS(SWA)
	6	1*6	GUWA906	GUWA206	GUWA406	GUWA306	GUWA106	4100	
	8	1*8	GUWA908	GUWA208	GUWA408	GUWA308	GUWA108	4100	
	12	1*12	GUWA912	GUWA212	GUWA412	GUWA312	GUWA112	4100	
(not listed in catalog)	24	1*24	GUWB924	GUWB224	GUWB424	GUWB324	GUWB124	2100	
Outdoor **Central tube cables** with **Steel Wire Armouring**	4	1*4	GOWA904	GOWA204	GOWA404	GOWA304	GOWA104	4100	Type-xxPE(SWA)
	6	1*6	GOWA906	GOWA206	GOWA406	GOWA306	GOWA106	4100	
	8	1*8	GOWA908	GOWA208	GOWA408	GOWA308	GOWA108	4100	
	12	1*12	GOWA912	GOWA212	GOWA412	GOWA312	GOWA112	4100	
(not listed in catalog)	24	1*24	GOWB924	GOWB224	GOWB424	GOWB324	GOWB124	2100	

Belden produce a wide variety of products, for products without part numbers or those not currently listed, please do not hesitate to contact Belden with your enquiry.

European Partnumber Coding

1	2		3		4		5		6 – 7
G	I	*Indoor*	S	*Stand. RP*	T	*Tight*	1	*62.5/125-OM1*	***Fibre-count (144 = 44)***
	O	*Outdoor*	R	*Impr. RP*	S	*Semi-tight*	2	*50/125-OM2*	
	U	*Universal*	W	*SWA*	K	*Dry semi-tight*	3	*50/125-OM3*	
	A	*Aerial*	P	*Patchcord*	A	*Central tube T12*	4	*50/125-OM2e*	
	M	*Mobile*	B	*Breakout*	B	*Central tube T24*			
			M	*Mini-Breakout*	C	*Multi-tube T48*			
			X	*Mini-BO+RP*	D	*Multi-tube T72*	9	*9/125-OS1*	
			O	*Pigtail*	E	*Multi-tube T96*	0	*No fibre, APF*	
					F	*Multi-tube T144*			

Universal (outdoor & indoor use)

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Multi-tube Optical Fibre Cables • halogen-free, metal-free

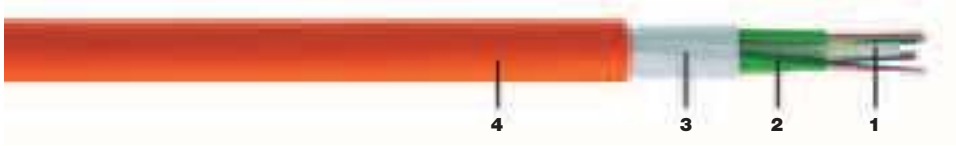
Application

- For outdoor and indoor use in structured (data) wiring systems such as campus backbone, building backbone (riser) and/or horizontal cabling. Support all computer network applications such as FDDI, Gigabit Ethernet and ATM.
- For outdoor and indoor use in networks for telecom, cable TV and/or broadcast.
- Easy to install in ducts, tunnels, trenches and/or tubes (by means of compressed air or pulling wire). Suitable for direct burial (crush ≤ 150 N/cm).

Key features

- These cables are halogen-free (= FRNC and LSNH) and therefore suitable for both outdoor and indoor use. Consequently splicing can be avoided and the installation gets more cost-effective.
- Installation friendly dry interstices between the loose tubes.
- All dielectric cables with standard or improved rodent protection.
- Predicted life time > 30 years.

Construction & dimensions



Cable specifications (construction in accordance with IEC 60794)

1. Dielectric central element of glass reinforced plastic (GRP), also as protection against kinks, surrounded by swelling tape.
2. Jelly filled (non dripping and silicon-free) loose tubes with primary coated optical fibres (Ø 250 ± 15 µm).
   Individually colour coded optical fibres: red – natural – yellow – blue – green – violet – brown – black – orange – turquoise – pink and white.
   The loose tubes are stranded around the central element, if necessary with blind elements (black tubes without fibres).
   Colour coding of the loose tubes: 1. red – 2. white – rest blue (62.5/125) or green (50/125) or yellow (9/125)
3. Swellable yarns as strength members and for the longitudinal watertightness.
   With improved rodent protection: halogen-free inner jacket + polyamid (nylon) layer + halogen-free outer jacket.
4. Orange halogen-free (FRNC/LSNH) outer jacket.
   Identification: BELDEN OFC – "cable type" – "number x type of fibre" + date-, meter- and P/N-marking.

Mechanical data

No. of fibres	24	36	48	24	48	72	96	144
		type-48dc			type-72dc		type-96dc	type-144dc
Cable core	6 x 4	6 x 6	6 x 8	2 x 12	4 x 12	6 x 12	8 x 12	12 x 12
Ø Central element (mm)		2.1			2.6		2.6/4.3	3.5/7.6
Ø Loose tube (mm)		2.1			2.6		2.6	2.6
Type-xxdcNH	**with standard rodent protection**							
Ø nom./max. (mm)		9.8/10.1			11.0/11.3		12.7/13.0	16.0/16.3
Weight (kg/km)		107			130		167	255
Energy of flame (kJ/m)		1470			1945		2391	3427
Type-xxdcHR	**with improved rodent protection**							
Ø nom./max. (mm)		12.8/13.1			14.0/14.3		15.7/16.0	19.0/19.3
Weight (kg/km)		176			216		269	369
Energy of flame (kJ/m)		2807			3461		4147	4896

Options

- Outdoor cables with a PE outerjacket.
- Non-standard cable constructions like different types of fibres in one cable, colours, details and/or additional information regarding specifications are available on request.

The right to carry out technical modifications is reserved by the manufacturer.

Universal (outdoor & indoor use)

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Multi-tube Optical Fibre Cables • halogen-free, metal-free

Optical characteristics

Characteristics (cabled) Multi-Mode (MM) Graded-Index (GI) optical fibres according to IEC 60793

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Bandwidth (MHz x km)	Ethernet Performance (m)		Refractive Index
					1 GbE	10 GbE	
62.5/125	62.5 ± 2.5	850	3.0/3.2	≥ 200	275	33	1.495
OM1	125 ± 1	1300	0.6/0.8	≥ 600	550	n.a.	1.490
50/125	50 ± 2.5	850	2.5/2.7	≥ 600	550	82	1.481
OM2	125 ± 1	1300	0.5/0.8	≥ 1200	550	n.a.	1.476
50/125	50 ± 2.5	850	2.5/2.7	≥ 600	750	110	1.481
OM2e	125 ± 1	1300	0.5/0.8	≥ 1200	2000	n.a.	1.476
50/125	50 ± 2.5	850	2.5/2.7	≥ 1500	900	300	1.482
OM3	125 ± 1	1300	0.5/0.8	≥ 500	550	n.a.	1.477

Fibres with enhanced Gigabit Ethernet performance on request available.

Characteristics (cabled) Single-Mode (SM) Matched-Cladded (MC) optical fibres according to ITU-G.652B

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Dispersion (ps/(nm x km))	PMD (ps/√km)	Refractive Index
9/125	9.2 ± 0.4	1310	0.33/0.38	≤ 3.5		1.467
OS1	125 ± 1	1550	0.20/0.25	≤ 18	≤ 0.2	1.467

A test report (attenuation) is supplied with each delivery.

Mechanical, physical and/or environmental

- **Temperature range** according to IEC 60794-1-2-F1
  - Transport/storage –30 to +70 °C
  - Installation –5 to +50 °C
  - Operation –30 to +70 °C
- **Pulling tension** according to IEC 60794-1-2-E1
  - Type-48 and Type-72 ≤ 3000 N
  - Type-96 and Type-144 ≤ 4000 N
- **Bending radii for fibres and tubes**
  - Installation/operation > 25 mm
- **Halogen-free** according to IEC 60754-2 (HD 602)
  - Corrosivity pH ≥ 3.5 – µS/cm ≤ 100
- **Watertightness** according to IEC 60794-1-2-F5
- **Crush resistance** according to IEC 60794-1-2-E3
  - Loose tube ≤ 4000 N/m
  - Type-48 and Type-72 ≤ 15000 N/m
  - Type-96 and Type-144 ≤ 20000 N/m
- **Bending radii cable**
  - Static according to IEC 60794-1-2-E11 – 10 x Ø
  - Dynamic according to IEC 60794-1-2-E6 – 15 x Ø
- **Flame retardancy** according to IEC 60332-3C

- When laying and installing optical fibre cables it is vitally important not to exceed the specified values set for pulling tension, bending radii and temperature. The installation methods have to be in accordance with the common standards.
- To ease insertion into tubes by means of compressed air or pulling wire, certified lubricants (e.g. paraffin) may be used. The use of soap or similar substances as lubricants is strictly prohibited.
- If a cable needs to be fastened, constrictions ≥ 1 mm must be prevented.
- The jelly filling inside the tubes can be removed using a tissue soaked in turpentine.
- It is advisable to cap the cable-ends during storage.

- With standard rodent protection: Type-48dcNH, Type-72 dcNH, Type-96dcNH or Type-144 dcNH + fibre-count x fibre-type(s)
- With improved rodent protection: Type-48dcHR, Type-72dcHR, Type-96dcHR or Type-144dcHR + fibre-count x fibre-type(s)

Standard delivery lengths: Type-48: 4100 ± 100 m. Type-72, -96 and -144: 2100 ± 100 m.
On request available: Type-48: 5000 ± 100 m. Type-72, -96 and -144: 3000 ± 100 m.

Universal (outdoor & indoor use)

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Central tube Optical Fibre Cables • halogen-free, metal-free, max. 24 fibres

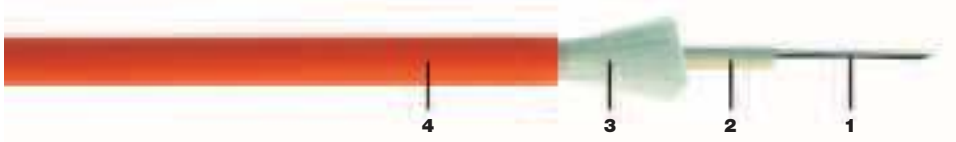
Application

- For outdoor and indoor use in structured (data) wiring systems such as campus backbone, building backbone (riser) and/or horizontal cabling. Support all computer network applications such as FDDI, Gigabit Ethernet and ATM.
- For outdoor and indoor use in networks for telecom, cable TV and/or broadcast.
- Easy to install in ducts, tunnels, trenches and/or tubes (by means of compressed air or pulling wire). Suitable for direct burial (crush ≤ 150 N/cm).

Key features

- A simple cable construction (and consequently more cost-effective up to 24 fibres then multi-tube cables) with standard or improved rodent protection.
- These cables are all dielectric and therefore immune to lightning and electromagnetic interference (EMC-safe), spark-free and require no earthing.
- Predicted life time > 30 years.

Construction & dimensions



Cable specifications (construction in accordance with IEC 60794)

1. Primary coated optical fibres: Ø 250 ± 15 µm.

2. Central tube, jelly filled (non dripping and silicon-free) with up to 24 fibres.
Individually colour coded optical fibres:
1 – 12: red – natural – yellow – blue – green – violet – brown – black – orange – turquoise – pink and white
13 – 24: red – natural – yellow – blue – green – violet – brown – grey – orange – turquoise – pink and white with black rings.

3. Swellable yarns as strength members and for the longitudinal watertightness.
With improved rodent protection: + extra swellable yarns.

4. Orange halogen-free (FRNC/LSNH) outer jacket.
Identification: BELDEN OFC – "cable type" – "number x type of fibre" + date-, meter- and P/N-marking.

Mechanical data

No. of fibres	4	8	12	24
Ø Central tube (mm)	4.2			
	with standard rodent protection			
Ø nom./max. (mm)	8.7/9.0			
Weight (kg/km)	72			
Energy of flame (kJ/m)	1370			
	with improved rodent protection			
Ø nom./max. (mm)	10.2/10.5			
Weight (kg/km)	104			
Energy of flame (kJ/m)	1680			

Options

- Cables from 1 to 24 fibres.
- Cables with a PE jacket for outdoor use.
- Non-standard cable constructions, colours, details and/or additional information regarding specifications are available on request.

The right to carry out technical modifications is reserved by the manufacturer.

Universal (outdoor & indoor use)

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Central tube Optical Fibre Cables • halogen-free, metal-free, max. 24 fibres

Optical characteristics

Characteristics (cabled) Multi-Mode (MM) Graded-Index (GI) optical fibres according to IEC 60793

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Bandwidth (MHz x km)	Ethernet Performance (m)		Refractive Index
					1 GbE	10 GbE	
62.5/125	62.5 ± 2.5	850	3.0/3.2	≥ 200	275	33	1.495
OM1	125 ± 1	1300	0.6/0.8	≥ 600	550	n.a.	1.490
50/125	50 ± 2.5	850	2.5/2.7	≥ 600	550	82	1.481
OM2	125 ± 1	1300	0.5/0.8	≥ 1200	550	n.a.	1.476
50/125	50 ± 2.5	850	2.5/2.7	≥ 600	750	110	1.481
OM2e	125 ± 1	1300	0.5/0.8	≥ 1200	2000	n.a.	1.476
50/125	50 ± 2.5	850	2.5/2.7	≥ 1500	900	300	1.482
OM3	125 ± 1	1300	0.5/0.8	≥ 500	550	n.a.	1.477

Fibres with enhanced Gigabit Ethernet performance on request available.

Characteristics (cabled) Single-Mode (SM) Matched-Cladded (MC) optical fibres according to ITU-G.652B

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Dispersion (ps/(nm x km))	PMD (ps/√km)	Refractive Index
9/125	9.2 ± 0.4	1310	0.33/0.38	≤ 3.5		1.467
OS1	125 ± 1	1550	0.20/0.25	≤ 18	≤ 0.2	1.467

A test report (attenuation) is supplied with each delivery.

Mechanical, physical and/or environmental

- **Temperature range** according to IEC 60794-1-2-F1
  - Transport/storage –30 to +70 °C
  - Installation –5 to +50 °C
  - Operation –30 to +70 °C
- **Pulling tension** according to IEC 60794-1-2-E1
  - with standard RP ≤ 1400 N
  - with improved RP ≤ 4000 N
- **Bending radii for fibres and tubes**
  - Installation/operation > 25 mm
- **Halogen-free** according to IEC 60754-2 (HD 602)
  - Corrosivity pH ≥ 3.5 – µS/cm ≤ 100
- **Watertightness** according to IEC 60794-1-2-F5
- **Crush resistance** according to IEC 60794-1-2-E3
  - Cable ≤ 15000 N/m
- **Bending radii cable**
  - Static according to IEC 60794-1-2-E11 – 10 x Ø
  - Dynamic according to IEC 60794-1-2-E6 – 15 x Ø
- **Flame retardancy** according to IEC 60332-3C

- When laying and installing optical fibre cables it is vitally important not to exceed the specified values set for pulling tension, bending radii and temperature. The installation methods have to be in accordance with the common standards.
- To ease insertion into tubes by means of compressed air or pulling wire, certified lubricants (e.g. paraffin) may be used. The use of soap or similar substances as lubricants is strictly prohibited.
- If a cable needs to be fastened, constrictions ≥ 0.3 mm must be prevented.
- The jelly filling inside the tubes can be removed using a tissue soaked in turpentine.
- It is advisable to cap the cable-ends during storage.

- With standard rodent protection: Type-24NH + fibre-count x fibre-type(s)
- With improved rodent protection: Type-24HR + fibre-count x fibre-type(s)

Standard delivery lengths: 2100 ± 100 m

Universal (outdoor & indoor use)

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Central tube Optical Fibre Cables • halogen-free, metal-free, max. 12 fibres

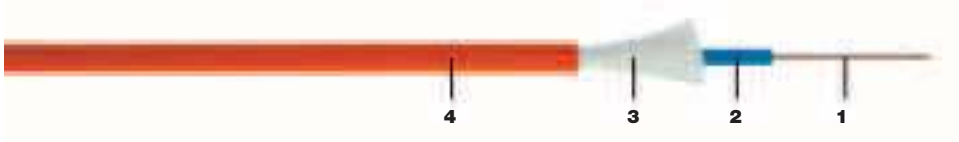
Application

- For outdoor and indoor use in structured (data) wiring systems such as campus backbone, building backbone (riser) and/or horizontal cabling. Support all computer network applications such as FDDI, Gigabit Ethernet and ATM.
- For outdoor and indoor use in networks for telecom, cable TV and/or broadcast.
- Easy to install in ducts, tunnels, trenches. Suitable for direct burial as long as the crush ≤ 100 N/cm.

Key features

- These cables are halogen-free (= FRNC and LSNH) and therefore suitable for both outdoor and indoor use. Consequently splicing can be avoided and the installation gets more cost-effective.
- A simple cable construction (and consequently more cost-effective up to 12 fibres then multi-tube cables) with standard or improved rodent protection.
- These cables are all dielectric and therefore immune to lightning and electromagnetic interference (EMC-safe), spark-free and require no earthing.
- Predicted life time > 30 years.

Construction & dimensions



Cable specifications (construction in accordance with IEC 60794)

1. Primary coated optical fibres: Ø 250 ± 15 µm.

2. Central tube, jelly filled (non dripping and silicon-free) with up to 12 fibres.
Individually colour coded optical fibres: red – natural – yellow – blue – green – violet – brown – black – orange – turquoise – pink and white.

3. Swellable yarns as strength members and for the longitudinal watertightness.
With improved rodent protection: + extra swellable yarns.

4. Orange halogen-free (FRNC/LSNH) outer jacket.
Identification: BELDEN OFC – "cable type" – "number x type of fibre" + date-, meter- and P/N-marking.

Mechanical data

No. of fibres	4	8	12
Ø Central tube (mm)	3.2		
	with standard rodent protection		
Ø nom./max. (mm)	5.8 / 6.1		
Weight (kg/km)	37		
Energy of flame (kJ/m)	550		
	with improved rodent protection		
Ø nom./max. (mm)	7.1 / 7.4		
Weight (kg/km)	55		
Energy of flame (kJ/m)	755		

Options

- Cables from 1 to 12 fibres.
- Outdoor cables with a black PE outer jacket.
- Non-standard cable constructions, colours, details and/or additional information regarding specifications are available on request.

The right to carry out technical modifications is reserved by the manufacturer.

Universal (outdoor & indoor use)

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Central tube Optical Fibre Cables • halogen-free, metal-free, max. 12 fibres

Optical characteristics

Characteristics (cabled) Multi-Mode (MM) Graded-Index (GI) optical fibres according to IEC 60793

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Bandwidth (MHz x km)	Ethernet Performance (m)		Refractive Index
					1 GbE	10 GbE	
62.5/125	62.5 ± 2.5	850	3.0/3.2	≥ 200	275	33	1.495
OM1	125 ± 1	1300	0.6/0.8	≥ 600	550	n.a.	1.490
50/125	50 ± 2.5	850	2.5/2.7	≥ 600	550	82	1.481
OM2	125 ± 1	1300	0.5/0.8	≥ 1200	550	n.a.	1.476
50/125	50 ± 2.5	850	2.5/2.7	≥ 600	750	110	1.481
OM2e	125 ± 1	1300	0.5/0.8	≥ 1200	2000	n.a.	1.476
50/125	50 ± 2.5	850	2.5/2.7	≥ 1500	900	300	1.482
OM3	125 ± 1	1300	0.5/0.8	≥ 500	550	n.a.	1.477

Fibres with enhanced Gigabit Ethernet performance on request available.

Characteristics (cabled) Single-Mode (SM) Matched-Cladded (MC) optical fibres according to ITU-G.652B

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Dispersion (ps/(nm x km))	PMD (ps/√km)	Refractive Index
9/125	9.2 ± 0.4	1310	0.33/0.38	≤ 3.5		1.467
OS1	125 ± 1	1550	0.20/0.25	≤ 18	≤ 0.2	1.467

A test report (attenuation) is supplied with each delivery.

Mechanical, physical and/or environmental

- **Temperature range** according to IEC 60794-1-2-F1
  - Transport/storage –30 to +70 °C
  - Installation –5 to +50 °C
  - Operation –30 to +70 °C
- **Pulling tension** according to IEC 60794-1-2-E1
  - with standard RP ≤ 700 N
  - with improved RP ≤ 1400 N
- **Bending radii for fibres and tubes**
  - Installation/operation > 25 mm
- **Halogen-free** according to IEC 60754-2 (HD 602)
  - Corrosivity pH ≥ 3.5 – µS/cm ≤ 100
- **Watertightness** according to IEC 60794-1-2-F5
- **Crush resistance** according to IEC 60794-1-2-E3
  - Central tube and cable ≤ 10000 N/m
- **Bending radii cable**
  - Static according to IEC 60794-1-2-E11 – 10 x Ø
  - Dynamic according to IEC 60794-1-2-E6 – 15 x Ø
- **Flame retardancy** according to IEC 60332-3C

- When laying and installing optical fibre cables it is vitally important not to exceed the specified values set for pulling tension, bending radii and temperature. The installation methods have to be in accordance with the common standards.
- To ease insertion into tubes by means of compressed air or pulling wire, certified lubricants (e.g. paraffin) may be used. The use of soap or similar substances as lubricants is strictly prohibited.
- If a cable needs to be fastened, constrictions ≥ 0.3 mm must be prevented.
- The jelly filling inside the tubes can be removed using a tissue soaked in turpentine.
- It is advisable to cap the cable-ends during storage.

- With standard rodent protection: Type-12NH + fibre-count x fibre-type(s)
- With improved rodent protection: Type-12HR + fibre-count x fibre-type(s)

Standard delivery lengths: 4100 ± 100 m

Outdoor

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Multi-tube Optical Fibre Cables • metal-free

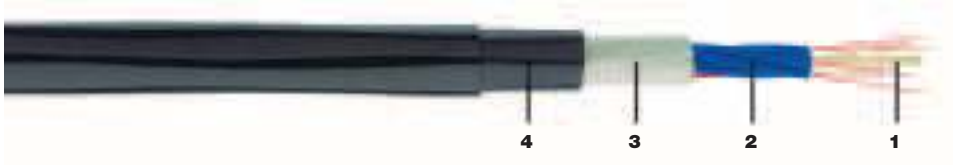
Application

- For outdoor use in structured (data) wiring systems (campus backbone). Support all computer network applications such as FDDI, Gigabit Ethernet and ATM.
- For outdoor use in networks for telecom, cable TV and/or broadcast.
- Easy to install in ducts, tunnels, trenches and/or tubes (by means of compressed air or pulling wire). Suitable for direct burial (crush ≤ 150 N/cm).

Key features

- These cables are all dielectric and therefore immune to lightning and electromagnetic interference (EMC-safe), spark-free and require no earthing.
- Installation friendly dry interstices between the loose tubes.
- All dielectric cables with standard or improved rodent protection.
- Predicted life time > 30 years.

Construction & dimensions



Cable specifications (construction in accordance with IEC 60794)

1. Dielectric central element of glass reinforced plastic (GRP), also as protection against kinks, surrounded by swelling tape.
2. Jelly filled (non dripping and silicon-free) loose tubes with primary coated optical fibres (Ø 250 ± 15 µm).
   Individually colour coded optical fibres: red – natural – yellow – blue – green – violet – brown – black – orange – turquoise – pink and white.
   The loose tubes are stranded around the central element, if necessary with blind elements (black tubes without fibres).
   Colour coding of the loose tubes: 1. red – 2. white – rest blue (62.5/125) or green (50/125) or yellow (9/125)
3. Swellable yarns as strength members and for the longitudinal watertightness.
4. Standard rodent protection: black UV-resistant outer jacket (PE).
   Improved rodent protection: PE inner jacket + black nylon outer jacket.
   Identification: BELDEN OFC – "cable type" – "number x type of fibre" + date-, meter- and P/N-marking.

Mechanical data

No. of fibres	24	36	48	24	48	72	96	144
		type-48dc			type-72dc		type-96dc	type-144dc
Cable core	6 x 4	6 x 6	6 x 8	2 x 12	4 x 12	6 x 12	8 x 12	12 x 12
Ø Central element (mm)		2.1			2.6		2.6/4.3	3.5/7.6
Ø Loose tube (mm)		2.1			2.6		2.6	2.6
Type-xxdcPE	**with standard rodent protection**							
Ø nom./max. (mm)		9.8/10.1			11.0/11.3		12.7/13.0	16.0/16.3
Weight (kg/km)		75			101		147	210
Energy of flame (kJ/m)		2300			2930		3554	4827
Type-xxdcRP	**with improved rodent protection**							
Ø nom./max. (mm)		11.4/11.7			12.6/12.9		14.3/14.6	17.6/17.9
Weight (kg/km)		103			130		182	252
Energy of flame (kJ/m)		3187			3916		4684	6232

Options

- Halogen-free (FRNC/LSNH) cables.
- Non-standard cable constructions like different types of fibres in one cable, colours, details and/or additional information regarding specifications are available on request.

The right to carry out technical modifications is reserved by the manufacturer.

Outdoor

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Multi-tube Optical Fibre Cables • metal-free

Optical characteristics

Characteristics (cabled) Multi-Mode (MM) Graded-Index (GI) optical fibres according to IEC 60793

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average/max. (dB/km)	Bandwidth (MHz x km)	Ethernet Performance (m)		Refractive Index
					1 GbE	10 GbE	
62.5/125	62.5 ± 2.5	850	3.0/3.2	≥ 200	275	33	1.495
OM1	125 ± 1	1300	0.6/0.8	≥ 600	550	n.a.	1.490
50/125	50 ± 2.5	850	2.5/2.7	≥ 600	550	82	1.481
OM2	125 ± 1	1300	0.5/0.8	≥ 1200	550	n.a.	1.476
50/125	50 ± 2.5	850	2.5/2.7	≥ 600	750	110	1.481
OM2e	125 ± 1	1300	0.5/0.8	≥ 1200	2000	n.a.	1.476
50/125	50 ± 2.5	850	2.5/2.7	≥ 1500	900	300	1.482
OM3	125 ± 1	1300	0.5/0.8	≥ 500	550	n.a.	1.477

Fibres with enhanced Gigabit Ethernet performance on request available.

Characteristics (cabled) Single-Mode (SM) Matched-Cladded (MC) optical fibres according to ITU-G.652B

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average/max. (dB/km)	Dispersion (ps/(nm x km))	PMD (ps/√km)	Refractive Index
9/125	9.2 ± 0.4	1310	0.33/0.38	≤ 3.5		1.467
OS1	125 ± 1	1550	0.20/0.25	≤ 18	≤ 0.2	1.467

A test report (attenuation) is supplied with each delivery.

Mechanical, physical and/or environmental

- **Temperature range** according to IEC 60794-1-2-F1
  - Transport/storage –30 to +70 °C
  - Installation –5 to +50 °C
  - Operation –30 to +70 °C
- **Pulling tension** according to IEC 60794-1-2-E1
  - Type-48 and Type-72 ≤ 3000 N
  - Type-96 and Type-144 ≤ 4000 N
- **Bending radii for fibres and tubes**
  - Installation/operation > 25 mm
- **Watertightness** according to IEC 60794-1-2-F5
- **Crush resistance** according to IEC 60794-1-2-E3
  - Loose tube ≤ 4000 N/m
  - Type-48 and Type-72 ≤ 15000 N/m
  - Type-96 and Type-144 ≤ 20000 N/m
- **Bending radii cable**
  - Static according to IEC 60794-1-2-E11 – 10 x Ø
  - Dynamic according to IEC 60794-1-2-E6 – 15 x Ø

- When laying and installing optical fibre cables it is vitally important not to exceed the specified values set for pulling tension, bending radii and temperature. The installation methods have to be in accordance with the common standards.
- To ease insertion into tubes by means of compressed air or pulling wire, certified lubricants (e.g. paraffin) may be used. The use of soap or similar substances as lubricants is strictly prohibited.
- If a cable needs to be fastened, constrictions ≥ 1 mm must be prevented.
- The jelly filling inside the tubes can be removed using a tissue soaked in turpentine.
- It is advisable to cap the cable-ends during storage.

- With standard rodent protection: Type-48dcPE, Type-72dcPE, Type-96dcPE or Type-144dcPE + fibre-count x fibre-type(s)
- With improved rodent protection: Type-48dcRP, Type-72dcRP, Type-96dcRP or Type-144dcRP + fibre-count x fibre-type(s)

Standard delivery lengths: Type-48: 4100 ± 100 m. Type-72, -96 and -144: 2100 ± 100 m.
On request available: Type-48: 5000 ± 100 m. Type-72, -96 and -144: 3000 ± 100 m.

Outdoor

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Central tube Optical Fibre Cables • metal-free, max. 24 fibres

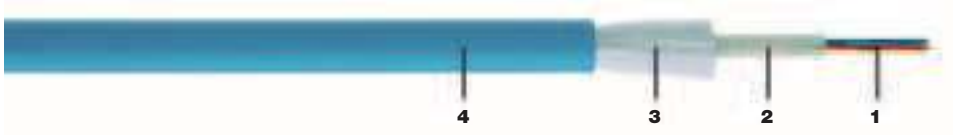
Application

- For outdoor use in structured (data) wiring systems (campus backbone). Support all computer network applications such as FDDI, Gigabit Ethernet and ATM.
- For outdoor use in networks for telecom, cable TV and/or broadcast.
- Easy to install in ducts, tunnels, trenches and/or tubes (by means of compressed air or pulling wire). Suitable for direct burial (crush ≤ 150 N/cm).

Key features

- A simple cable construction (and consequently more cost-effective up to 24 fibres then multi-tube cables) with standard or improved rodent protection.
- These cables are all dielectric and therefore immune to lightning and electromagnetic interference (EMC-safe), spark-free and require no earthing.
- Predicted life time > 30 years.

Construction & dimensions



Cable specifications (construction in accordance with IEC 60794)

1. Primary coated optical fibres: Ø 250 ± 15 µm.
2. Central tube, jelly filled (non dripping and silicon-free) with up to 24 fibres.
   Individually colour coded optical fibres:
   1 – 12: red – natural – yellow – blue – green – violet – brown – black – orange – turquoise – pink and white
   13 – 24: red – natural – yellow – blue – green – violet – brown – grey – orange – turquoise – pink and white with black rings.
3. Swellable yarns as strength members and for the longitudinal watertightness.
   With improved rodent protection: + extra swellable yarns.
4. UV resistant PE outer jacket.
   Black: standard rodent protection (RP) or
   Blue: Bluelight (improved rodent protection).
   Identification: BELDEN OFC – “cable type” – “number x type of fibre” + date-, meter- and P/N-marking.

Mechanical data

No. of fibres	4	8	12	24
Ø Central tube (mm)	4.2			
	with standard rodent protection			
Ø nom./max. (mm)	8.7/9.0			
Weight (kg/km)	66			
Energy of flame (kJ/m)	1700			
	with improved rodent protection			
Ø nom./max. (mm)	10.2/10.5			
Weight (kg/km)	96			
Energy of flame (kJ/m)	2200			

Options

- Cables from 1 to 24 fibres.
- Halogen-free cables for outdoor and/or indoor use.
- Non-standard cable constructions, colours, details and/or additional information regarding specifications are available on request.

The right to carry out technical modifications is reserved by the manufacturer.

Outdoor

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Central tube Optical Fibre Cables • metal-free, max. 24 fibres

Optical characteristics

Characteristics (cabled) Multi-Mode (MM) Graded-Index (GI) optical fibres according to IEC 60793

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average/max. (dB/km)	Bandwidth (MHz x km)	Ethernet Performance (m)		Refractive Index
					1 GbE	10 GbE	
62.5/125	62.5 ± 2.5	850	3.0/3.2	≥ 200	275	33	1.495
OM1	125 ± 1	1300	0.6/0.8	≥ 600	550	n.a.	1.490
50/125	50 ± 2.5	850	2.5/2.7	≥ 600	550	82	1.481
OM2	125 ± 1	1300	0.5/0.8	≥ 1200	550	n.a.	1.476
50/125	50 ± 2.5	850	2.5/2.7	≥ 600	750	110	1.481
OM2e	125 ± 1	1300	0.5/0.8	≥ 1200	2000	n.a.	1.476
50/125	50 ± 2.5	850	2.5/2.7	≥ 1500	900	300	1.482
OM3	125 ± 1	1300	0.5/0.8	≥ 500	550	n.a.	1.477

Fibres with enhanced Gigabit Ethernet performance on request available.

Characteristics (cabled) Single-Mode (SM) Matched-Cladded (MC) optical fibres according to ITU-G.652B

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average/max. (dB/km)	Dispersion (ps/(nm x km))	PMD (ps/√km)	Refractive Index
9/125	9.2 ± 0.4	1310	0.33/0.38	≤ 3.5		1.467
OS1	125 ± 1	1550	0.20/0.25	≤ 18	≤ 0.2	1.467

A test report (attenuation) is supplied with each delivery.

Mechanical, physical and/or environmental

- **Temperature range** according to IEC 60794-1-2-F1
  - Transport/storage –30 to +70 °C
  - Installation –5 to +50 °C
  - Operation –30 to +70 °C
- **Pulling tension** according to IEC 60794-1-2-E1
  - with standard RP ≤ 1400 N
  - with improved RP ≤ 4000 N
- **Bending radii for fibres and tubes**
  - Installation/operation > 25 mm
- **Watertightness** according to IEC 60794-1-2-F5
- **Crush resistance** according to IEC 60794-1-2-E3
  - Cable ≤ 15000 N/m
- **Bending radii cable**
  - Static according to IEC 60794-1-2-E11 – 10 x Ø
  - Dynamic according to IEC 60794-1-2-E6 – 15 x Ø

- When laying and installing optical fibre cables it is vitally important not to exceed the specified values set for pulling tension, bending radii and temperature. The installation methods have to be in accordance with the common standards.
- To ease insertion into tubes by means of compressed air or pulling wire, certified lubricants (e.g. paraffin) may be used. The use of soap or similar substances as lubricants is strictly prohibited.
- If a cable needs to be fastened, constrictions ≥ 0.3 mm must be prevented.
- The jelly filling inside the tubes can be removed using a tissue soaked in turpentine.
- It is advisable to cap the cable-ends during storage.

- With standard rodent protection: Type-24PE + fibre-count x fibre-type(s)
- With improved rodent protection: Type-24RP (bluelight) + fibre-count x fibre-type(s)

Standard delivery lengths: 2100 ± 100 m

Intex (for internal & external use)

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Mini-Breakout (Distribution) Optical Fibre Cables • halogen-free, metal-free

Application

- Structured (premises) wiring systems: campus and/or building backbone (riser) and/or horizontal cabling.
- Support all computer network applications such as FDDI, Gigabit Ethernet and ATM.
- Easy to install in ducts, tunnels and trenches. Not recommended for direct burial.

Key features

- These cables are halogen-free (= FRNC and LSNH) and watertight and therefore suitable for internal and external (= intex) use. Consequently splicing can be avoided and the installation gets more cost-effective.
- These cables are all dielectric and therefore immune to lightning and electromagnetic interference (EMC-safe), spark-free and require no earthing.
- Predicted life time > 30 years.

Construction & dimensions

Cable specifications (construction in accordance with IEC 60794)

1. Swellable reinforced yarns as common strength members and for the longitudinal watertightness.
2. Primary coated optical fibres: Ø 280 ± 15 µm.
3. Tight buffered fibres: Ø 0.9 ± 0.1 mm.
   Colour coding of the buffered fibres:
   white – red – blue – yellow – green – violet – brown – black – orange – turquoise – pink – grey
   of the fibres 1 – 12 the secondary coating is coloured
   of the fibres 13 – 24 the primary coating is coloured and the secondary coating is transparent.
4. Swellable tape.
5. Orange halogen-free (FRNC/LSNH) outer jacket.
   Identification: BELDEN OFC – INTEX-MINI-BREAKOUT – I/A-VQ(ZN)H – "number x type of fibre" + date-, meter- and P/N-marking.

Mechanical data

No. of fibres	4	6	8	12	24
Ø nom. (mm)	5.4	5.9	5.9	7.6	9.6
Max. pulling tension (N)	400	450	450	500	600
Energy of flame (kJ/m)	296	347	371	622	1082
Weight (kg/km)	26	30	32	45	65

Options

- Improved rodent protection by means of extra nylon outer jacket or extra glass rovings.
- Indoor Mini-Breakout with tight buffered fibres.
- Indoor Mini-Breakout with excellent strippable dry semi-tight buffered fibres.
- Non-standard cable constructions, colours, details and/or additional information regarding specifications are available on request.

The right to carry out technical modifications is reserved by the manufacturer.

Intex (for internal & external use)

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Mini-Breakout (Distribution) Optical Fibre Cables • halogen-free, metal-free

Optical characteristics

Characteristics (cabled) Multi-Mode (MM) optical fibres according to IEC 60793

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Bandwidth (MHz x km)	Ethernet Performance (m)		Refractive Index
					1 GbE	10 GbE	
62.5/125	62.5 ± 2.5	850	3.0/3.2	≥ 200	275	33	1.495
OM1	125 ± 1	1300	0.7/0.9	≥ 600	550	n.a.	1.490
50/125	50 ± 2.5	850	2.6/2.8	≥ 600	550	82	1.481
OM2	125 ± 1	1300	0.6/0.9	≥ 1200	550	n.a.	1.476
50/125	50 ± 2.5	850	2.6/2.8	≥ 600	750	110	1.481
OM2e	125 ± 1	1300	0.6/0.9	≥ 1200	2000	n.a.	1.476
50/125	50 ± 2.5	850	2.6/2.8	≥ 1500	900	300	1.482
OM3	125 ± 1	1300	0.6/0.9	≥ 500	550	n.a.	1.477

Fibres with enhanced Gigabit Ethernet performance on request available.

Characteristics (cabled) Single-Mode (SM) Matched-Cladded (MC) optical fibres according to ITU-G.652B

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Dispersion (ps/(nm x km))	PMD (ps/√km)	Refractive Index
9/125	9.2 ± 0.4	1310	0.35/0.5	≤ 3.5		1.467
patchcord quality	125 ± 0.5	1550	0.21/0.3	≤ 18	≤ 0.2	1.467

A test report (attenuation) is supplied with each delivery.

Mechanical, physical and/or environmental

- **Temperature range** according to IEC 60794-1-2-F1
  - Transport/storage –30 to +70 °C
  - Installation –5 to +50 °C
  - Operation –30 to +70 °C
- **Pulling tension** according to IEC 60794-1-2-E1
  - see table with dimensions
- **Bending radii for fibres and tubes**
  - Installation/operation > 25 mm
- **Halogen-free** according to IEC 60754-2 (HD 602)
  - Corrosivity pH ≥ 3.5 – µS/cm ≤ 100
- **Strippability**
  - Secondary coating only ≤ 10 cm
  - Secondary + primary coating ≤ 10 mm
- **Watertightness** according to IEC 60794-1-2-F5
- **Crush resistance** according to IEC 60794-1-2-E3
  - Tight buffer ≤ 4000 N/m
  - Cable ≤ 4000 N/m
- **Bending radii cable**
  - Static according to IEC 60794-1-2-E11 – 15 x Ø
  - Dynamic according to IEC 60794-1-2-E6 – 20 x Ø
- **Flame retardancy** according to IEC 60332-2

- When laying and installing optical fibre cables it is vitally important not to exceed the specified values set for pulling tension, bending radii and temperature. The installation methods have to be in accordance with the common standards.
- To ease insertion into tubes certified lubricants (e.g. paraffin) may be used. The use of soap or similar substances as lubricants is strictly prohibited.
- If a cable needs to be fastened, constrictions ≥ 0.3 mm must be prevented.
- It is advisable to cap the cable-ends during storage.

- Intex Mini-Breakout + fibre-count x fibre-type

Standard delivery lengths: 2100 ± 100 m

Indoor

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Mini-Breakout (Distribution) Optical Fibre Cables • halogen-free, metal-free

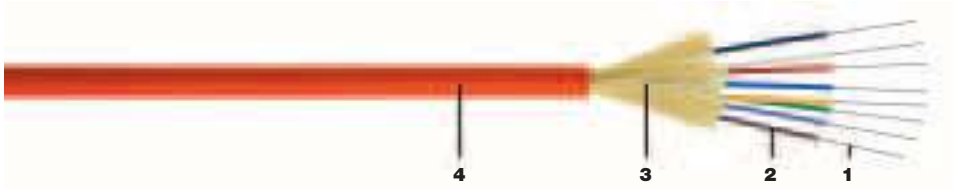
Application

- Structured (premises) wiring systems: building backbone (riser) and/or horizontal cabling (Fibre To The Desk).
- Support all computer network applications such as FDDI, Gigabit Ethernet and ATM.

Key features

- These cables are halogen-free = FRNC (Flame Retardant, Non Corrosive) and LSNH (Low Smoke, Non Halogen).
- These cables are all dielectric and therefore immune to lightning and electromagnetic interference (EMC-safe), spark-free and require no earthing.
- Predicted life time > 30 years.

Construction & dimensions



Cable specifications (construction in accordance with IEC 60794)

1. Primary coated optical fibres: Ø 280 ± 15 µm.
2. Tight buffered fibres: Ø 0.9 ± 0.1 mm.
   Colour coding of the buffered fibres:
   white – red – blue – yellow – green – violet – brown – black – orange – turquoise – pink – grey
   of the fibres 1 – 12 the secondary coating is coloured
   of the fibres 13 – 24 the primary coating is coloured and the secondary coating is transparent.
3. Reinforced yarns as common strength members.
4. Orange halogen-free (FRNC/LSNH) outer jacket.
   Identification: BELDEN OFC – FRNC MINI-BREAKOUT – I-V(ZN)H – “number x type of fibre” + date-, meter- and P/N-marking.

Mechanical data

No. of fibres	2	4	6	8	12	16	24
Ø nom. (mm)	4.0	4.8	5.3	5.3	7.0	8.0	9.0
Max. pulling tension (N)	400	400	450	450	500	500	600
Energy of flame (kJ/m)	227	294	339	351	619	886	1044
Weight (kg/ km)	16	19	23	25	40	49	57

Options

- Indoor Mini-Breakout cables with excellent strippable dry semi-tight buffered fibres.
- Intex Mini-Breakout cables for internal and external use.
- Non-standard cable constructions, colours, details and/or additional information regarding specifications are available on request.

The right to carry out technical modifications is reserved by the manufacturer.

Indoor

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Mini-Breakout (Distribution) Optical Fibre Cables • halogen-free, metal-free

Optical characteristics

Characteristics (cabled) Multi-Mode (MM) optical fibres according to IEC 60793

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Bandwidth (MHz x km)	Ethernet Performance (m)		Refractive Index
					1 GbE	10 GbE	
62.5/125 OM1	62.5 ± 2.5 125 ± 1	850 1300	3.0/3.2 0.7/0.9	≥ 200 ≥ 600	275 550	33 n.a.	1.495 1.490
50/125 OM2	50 ± 2.5 125 ± 1	850 1300	2.6/2.8 0.6/0.9	≥ 600 ≥ 1200	550 550	82 n.a.	1.481 1.476
50/125 OM2e	50 ± 2.5 125 ± 1	850 1300	2.6/2.8 0.6/0.9	≥ 600 ≥ 1200	750 2000	110 n.a.	1.481 1.476
50/125 OM3	50 ± 2.5 125 ± 1	850 1300	2.6/2.8 0.6/0.9	≥ 1500 ≥ 500	900 550	300 n.a.	1.482 1.477

Fibres with enhanced Gigabit Ethernet performance on request available.

Mechanical, physical and/or environmental

- **Temperature range** according to IEC 60794-1-2-F1
  - Transport/storage –30 to +70 °C
  - Installation –5 to +50 °C
  - Operation –5 to +55 °C
- **Pulling tension** according to IEC 60794-1-2-E1
  - See table with dimensions
- **Bending radii for fibres and tight buffers**
  - Installation/operation > 25 mm
- **Halogen-free** according to IEC 60754-2 (HD 602)
  - Corrosivity pH ≥ 3.5 – µS/cm ≤ 100
- **Strippability**
  - Secondary coating only ≤ 10 cm
  - Secondary + primary coating ≤ 10 mm
- **Crush resistance** according to IEC 60794-1-2-E3
  - Tight buffer ≤ 4000 N/m
  - Cable ≤ 4000 N/m
- **Bending radii cable**
  - Static according to IEC 60794-1-2-E11 – 15 x Ø
  - Dynamic according to IEC 60794-1-2-E6 – 20 x Ø
- **Flame retardancy** according to IEC 60332-2

- When laying and installing optical fibre cables it is vitally important not to exceed the specified values set for pulling tension, bending radii and temperature. The installation methods have to be in accordance with the common standards.
- To ease insertion certified lubricants (e.g. paraffin) may be used. The use of soap or similar substances as lubricants is strictly prohibited.
- If a cable needs to be fastened, constrictions ≥ 0.3 mm must be prevented.

- Indoor Mini-Breakout with tight buffered fibres + fibre-count x fibre-type

Standard delivery lengths: 2100 ± 100 m

Indoor

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Breakout Optical Fibre Cables • halogen-free, metal-free

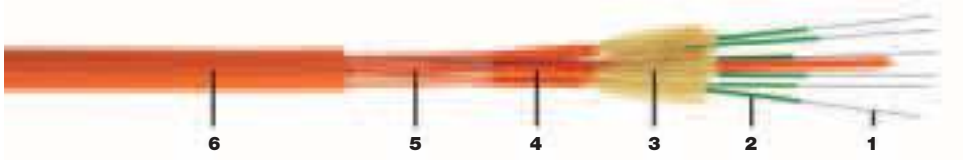
Application

- Structured (premises) wiring systems: building backbone (riser) and/or horizontal cabling.
- Support all computer network applications such as FDDI, Gigabit Ethernet and ATM.
- Easy to install in ducts, tunnels and trenches.

Key features

- The individual single fibre units (of which these metal-free breakout cables are composed) permit direct (detensioned) terminations with separate single-way connectors, which eliminate splicing of pigtails and/or breakout kits.
- These cables are halogen-free (= FRNC and LSNH) and metal-free (all dielectric).
- Predicted life time > 30 years.

Construction & dimensions



Cable specifications (construction in accordance with IEC 60794)

1. Primary coated optical fibres: Ø 280 ± 15 µm.
2. Tight buffered fibres: Ø 0.9 ± 0.1 mm.
3. Reinforced yarns as strength members.
4. Orange halogen-free (FRNC/LSNH), numbered jacket (Ø 2.1 ± 0.2 mm).
5. Tape.
6. Orange halogen-free (FRNC/LSNH) outer jacket with rip cord.
   Identification: BELDEN OFC – FRNC BREAKOUT – I-V(ZN)H-H – "number x type of fibre" + date-, meter- and P/N-marking.

Mechanical data

No. of fibres	2	4	6	8	12	24
Cable core	2 + 2 BE	CE + 4	CE + 6	CE + 8	3 + 9	2 + 8 + 14
Ø nom. (mm)	5.3	6.2	8.0	9.4	10.5	14.3
Max. Pulling tension (N)	400	400	600	800	1200	2400
Energy of flame (kJ/m)	379	507	928	1235	1424	2677
Weight (kg/ km)	25	31	59	77	87	175

BE = Blind Element, CE = Central Element

Options

- Mixed fibre types.
- Breakout cables with excellent strippable dry semi-tight buffered fibres.
- Intex Breakout cables for indoor and/or outdoor use on request available.
- Non-standard cable constructions, colours, details and/or additional information regarding specifications are available on request.

The right to carry out technical modifications is reserved by the manufacturer.

Indoor

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Breakout Optical Fibre Cables • halogen-free, metal-free

Optical characteristics

Characteristics (cabled) Multi-Mode (MM) optical fibres according to IEC 60793

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Bandwidth (MHz x km)	Ethernet Performance (m)		Refractive Index
					1 GbE	10 GbE	
62.5/125	62.5 ± 2.5	850	3.0/3.2	≥ 200	275	33	1.495
OM1	125 ± 1	1300	0.7/0.9	≥ 600	550	n.a.	1.490
50/125	50 ± 2.5	850	2.6/2.8	≥ 600	550	82	1.481
OM2	125 ± 1	1300	0.6/0.9	≥ 1200	550	n.a.	1.476
50/125	50 ± 2.5	850	2.6/2.8	≥ 600	750	110	1.481
OM2e	125 ± 1	1300	0.6/0.9	≥ 1200	2000	n.a.	1.476
50/125	50 ± 2.5	850	2.6/2.8	≥ 1500	900	300	1.482
OM3	125 ± 1	1300	0.6/0.9	≥ 500	550	n.a.	1.477

Fibres with enhanced Gigabit Ethernet performance on request available.

Characteristics (cabled) Single-Mode (SM) Matched-Cladded (MC) optical fibres according to ITU-G.652B

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Dispersion (ps/(nm x km))	PMD (ps/√km)	Refractive Index
9/125	9.2 ± 0.4	1310	0.35/0.5	≤ 3.5		1.467
patchcord quality	125 ± 0.5	1550	0.21/0.3	≤ 18	≤ 0.2	1.467

A test report (attenuation) is supplied with each delivery.

Mechanical, physical and/or environmental

- **Temperature range** according to IEC 60794-1-2-F1
  - Transport/storage –30 to +70 °C
  - Installation –5 to +50 °C
  - Operation –5 to +55 °C
- **Pulling tension** according to IEC 60794-1-2-E1
  - Single fibre unit 110 N
  - Cables: see table with dimensions
- **Bending radii for fibres and tight buffers**
  - Installation/operation > 25 mm
- **Halogen-free** according to IEC 60754-2 (HD 602)
  - Corrosivity pH ≥ 3.5 – µS/cm ≤ 100
- **Strippability**
  - Secondary coating only ≤ 10 cm
  - Secondary + primary coating ≤ 10 mm
- **Crush resistance** according to IEC 60794-1-2-E3
  - Tight buffer ≤ 4000 N/m
  - Single fibre unit ≤ 4000 N/m
  - Cable ≤ 7500 N/m
- **Bending radii cable**
  - Static according to IEC 60794-1-2-E11 – 10 x Ø
  - Dynamic according to IEC 60794-1-2-E6 – 20 x Ø
- **Flame retardancy** according to IEC 60332-1

- When laying and installing optical fibre cables it is vitally important not to exceed the specified values set for pulling tension, bending radii and temperature. The installation methods have to be in accordance with the common standards.
- If a cable needs to be fastened, constrictions must be avoided.
- To ease insertion certified lubricants (e.g. paraffin) may be used. The use of soap or similar substances as lubricants is strictly prohibited.
- Indoor optical fibre cables have been designed for use inside buildings. Consequently they are not longitudinal watertight.

- Indoor Breakout with tight buffered fibres + fibre-count x fibre-type

Standard delivery lengths: 2100 ± 100 m

Indoor

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Interconnection (simplex & duplex) Cables • halogen-free, metal-free

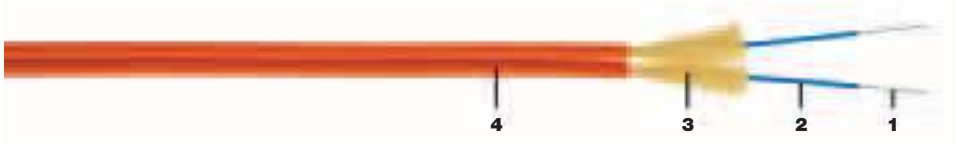
Application

- Flexible terminating leads such as pigtails, patchcords and test leads.
- Support all computer network applications such as FDDI, Gigabit Ethernet and ATM.
- Short distance applications for indoor use.

Key features

- These cables are based on excellent strippable semi-tight buffered optical fibres.
- All dielectric (metal-free) optical fibre leads permitting direct (detensioned) termination with connectors.
- These cables are halogen-free = FRNC (Flame Retardant, Non Corrosive) and LSNH (Low Smoke, Non Halogen).
- Predicted life time > 30 years.

Construction & dimensions



Cable specifications (construction in accordance with IEC 60794)

1. Primary coated optical fibres: Ø 250 ± 15 µm.

2. Semi-tight buffer: Ø 0.9 ± 0.1 mm.
Colour coding of the buffered fibres with MM 62.5/125: blue
with MM 50/125: green
with SM 9/125: yellow

3. Aramid yarns as strength members.

4. Orange halogen-free (FRNC/LSNH) outer jacket. The outer jacket of the duplex version is extruded in a good splittable shape.
Identification: BELDEN OFC – "cable type" – I-V(ZN)H – "number x type of fibre" + date-, meter- and P/N-marking.

Mechanical data

No. of fibres	1	2
Type	Simplex	Duplex Fig. 8
Ø nominal (mm)	2.8 ± 0.2	(2.8 x 5.7) ± 0.2
Energy of flame (kJ/m)	128	256
Weight (kg/km)	7.1	14.1

Options

- Non-standard cable constructions, colours, details and/or additional information regarding specifications are available on request.

The right to carry out technical modifications is reserved by the manufacturer.

Indoor

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Interconnection (simplex & duplex) Cables • halogen-free, metal-free

Optical characteristics

Characteristics (cabled) Multi-Mode (MM) optical fibres according to IEC 60793

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Bandwidth (MHz x km)	Ethernet Performance (m)		Refractive Index
					1 GbE	10 GbE	
62.5/125	62.5 ± 2.5	850	3.0/3.2	≥ 200	275	33	1.495
OM1	125 ± 1	1300	0.7/0.9	≥ 600	550	n.a.	1.490
50/125	50 ± 2.5	850	2.6/2.8	≥ 600	550	82	1.481
OM2	125 ± 1	1300	0.6/0.9	≥ 1200	550	n.a.	1.476
50/125	50 ± 2.5	850	2.6/2.8	≥ 600	750	110	1.481
OM2e	125 ± 1	1300	0.6/0.9	≥ 1200	2000	n.a.	1.476
50/125	50 ± 2.5	850	2.6/2.8	≥ 1500	900	300	1.482
OM3	125 ± 1	1300	0.6/0.9	≥ 500	550	n.a.	1.477

Fibres with enhanced Gigabit Ethernet performance on request available.

Characteristics (cabled) Single-Mode (SM) Matched-Cladded (MC) optical fibres according to ITU-G.652B

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Dispersion (ps/(nm x km))	PMD (ps/√km)	Refractive Index
9/125	9.2 ± 0.4	1310	0.35/0.5	≤ 3.5		1.467
patchcord quality	125 ± 0.5	1550	0.21/0.3	≤ 18	≤ 0.2	1.467

A test report (attenuation) is supplied with each delivery.

Mechanical, physical and/or environmental

- **Temperature range** for lengths ≤ 100 m
  - Transport/storage –30 to +70 °C
  - Installation –5 to +50 °C
  - Operation –5 to +55 °C
- **Pulling tension** according to IEC 60794-1-2-E1
  - Semi-tight buffer ≤ 3 N
  - Simplex cable ≤ 200 N
  - Duplex cable ≤ 400 N
- **Bending radii for fibres and tight buffers**
  - Installation/operation > 25 mm
- **Halogen-free** according to IEC 60754-2 (HD 602)
  - Corrosivity pH ≥ 3.5 – µS/cm ≤ 100
- **Strippability**
  - Secondary coating only ≤ 100 cm
  - Secondary + primary coating ≤ 25 mm
- **Crush resistance** according to IEC 60794-1-2-E3
  - Semi-tight buffer ≤ 4000 N/m
  - Simplex cable ≤ 10000 N/m
  - Duplex cable ≤ 20000 N/m
- **Bending radii cable**
  - Static according to IEC 60794-1-2-E11 – 15 x Ø
  - Dynamic according to IEC 60794-1-2-E6 – 20 x Ø
- **Flame retardancy** according to IEC 60332-1

- When using Interconnection optical fibre cables it is vitally important not to exceed the specified values set for pulling tension, bending radii and temperature. The installation and termination methods have to be in accordance with the common standards.
- The primary and secondary coating are separated by means of a very thin layer of jelly. Consequently the strippability is very good. If necessary the jelly can be removed using a tissue soaked in turpentine, for example.
- Interconnection optical fibre cables have been designed for short distance applications (tens of meters) inside buildings.

- Simplex - 1 x fibre-type
- Duplex Fig. 8 - 2 x fibre-type

Standard delivery lengths: 2100 ± 100 m

Indoor

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Pigtails • Dry semi-tight buffered optical fibres

Application and key features

- Flexible terminating leads such as pigtails.
- Support all computer network applications such as FDDI, Gigabit Ethernet and ATM.
- Dry semi-tight buffered fibres with excellent strippability.
- Predicted life time > 30 years.

Construction & dimensions

Cable specifications (construction in accordance with IEC 60794)

1. Primary coated optical fibres: Ø 250 ± 15 µm.

2. Dry semi-tight buffer: Ø 0.9 ± 0.1 mm.

Optical characteristics

Characteristics (cabled) Multi-Mode (MM) optical fibres according to IEC 60793

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Bandwidth (MHz x km)	Ethernet Performance (m)		Refractive Index
					1 GbE	10 GbE	
62.5/125	62.5 ± 2.5	850	3.0/3.2	≥ 200	275	33	1.495
OM1	125 ± 1	1300	0.7/0.9	≥ 600	550	n.a.	1.490
50/125	50 ± 2.5	850	2.6/2.8	≥ 600	550	82	1.481
OM2	125 ± 1	1300	0.6/0.9	≥ 1200	550	n.a.	1.476
50/125	50 ± 2.5	850	2.6/2.8	≥ 600	750	110	1.481
OM2e	125 ± 1	1300	0.6/0.9	≥ 1200	2000	n.a.	1.476
50/125	50 ± 2.5	850	2.6/2.8	≥ 1500	900	300	1.482
OM3	125 ± 1	1300	0.6/0.9	≥ 500	550	n.a.	1.477

Fibres with enhanced Gigabit Ethernet performance on request available.

Characteristics (cabled) Single-Mode (SM) Matched-Cladded (MC) optical fibres according to ITU-G.652B

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average / max. (dB/km)	Dispersion (ps/(nm x km))	PMD (ps/√km)	Refractive Index
9/125	9.2 ± 0.4	1310	0.35/0.5	≤ 3.5		1.467
patchcord quality	125 ± 0.5	1550	0.21/0.3	≤ 18	≤ 0.2	1.467

A test report (attenuation) is supplied with each delivery.

- **Temperature range**
  - Transport/storage: –30 to +70 °C
  - Installation: –5 to +50 °C
  - Operation: –5 to +55 °C
- **Pulling tension**: ≤ 3 N
- **Bending radii for fibres and tight buffers**
  - Installation / operation: > 25 mm
- **Strippability**
  - Secondary coating only: ≤ 100 cm
  - Secondary + primary coating: ≤ 25 mm
- **Crush resistance**: according to IEC 60794-1-2-E3
  - Dry semi-tight buffer: ≤ 4000 N/m

- When using (semi-)tight buffered optical fibres it is vitally important not to exceed the specified values set for pulling tension, bending radii and temperature.
- (Semi-)tight buffered optical fibres have been designed for short distance (≤ 10 m) applications.

- Dry semi-tight buffer + fibre-type

Standard delivery lengths: 2100 ± 100 m

The right to carry out technical modifications is reserved by the manufacturer.

Specials

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Mobile cables

Application

- These metal-free mobile cables have been designed for despooling and respooling repeatedly.

Construction & dimensions

Cable specifications

1. Primary coated optical fibres: Ø 280 ± 15 µm.
2. Tight buffered fibres: Ø 0.9 ± 0.1 mm.
   Colour coding of the buffered fibres: white – red – blue – yellow – green – violet – brown – black.
3. Swellable reinforced yarns as common strength members and for the longitudinal watertightness.
4. Polyurethane outer jacket.
   Identification: BELDEN OFC – MOBILE CABLE – "number x type of fibre" + date-, meter- and P/N-marking.

Mechanical Data

No. of fibres	4	6	8
Ø nom. (mm)	5.8	6.3	7.0
Max. pulling tension (N)	800	950	1100
Energy of flame (kJ/m)	580	725	890
Weight (kg/km)	31	38	47

Optical characteristics

Characteristics (cabled) Multi-Mode (MM) Graded-Index (GI) optical fibres according to IEC 60793

Fibre-type	Size (µm)	Wavelength (nm)	Attenuation average/max. (dB/km)	Bandwidth (MHz x km)	Ethernet Performance (m)		Refractive Index
					1 GbE	10 GbE	
62.5/125	62.5 ± 2.5	850	3.0/3.2	≥ 200	275	33	1.495
OM1	125 ± 1	1300	0.7/0.9	≥ 600	550	n.a.	1.490
50/125	50 ± 2.5	850	2.6/2.8	≥ 600	550	82	1.481
OM2	125 ± 1	1300	0.6/0.9	≥ 1200	550	n.a.	1.476
50/125	50 ± 2.5	850	2.6/2.8	≥ 600	750	110	1.481
OM2e	125 ± 1	1300	0.6/0.9	≥ 1200	2000	n.a.	1.476
50/125	50 ± 2.5	850	2.6/2.8	≥ 1500	900	300	1.482
OM3	125 ± 1	1300	0.6/0.9	≥ 500	550	n.a.	1.477

Single-Mode or Multi-Mode fibres with enhanced Gigabit Ethernet performance on request available.

A test report (attenuation) is supplied with each delivery.

- **Temperature range** according to IEC 60794-1-2-F1
  Transport/storage –30 to +70 °C
  Installation –5 to +50 °C
  Operation –30 to +70 °C
- **Pulling tension** according to IEC 60794-1-2-E1
  Cables: see table with dimensions
- **Bending radii for fibres and tubes**
  Installation/operation > 25 mm
- **Repeated bending** according to IEC 60794-1-2-E6
  > 500.000 times
- **Strippability**
  Secondary coating only ≤ 10 cm
  Secondary + primary coating ≤ 10 mm
- **Watertightness** according to IEC 60794-1-2-F5
- **Flame retardancy** according to IEC 60332-2
- **Crush resistance** according to IEC 60794-1-2-E3
  Tight buffer and cable ≤ 4000 N/m
- **Bending radii cable**
  Static according to IEC 60794-1-2-E11 – 15 x Ø
  Dynamic according to IEC 60794-1-2-E6 – 20 x Ø

- When laying and installing optical fibre cables it is vitally important not to exceed the specified values set for pulling tension, bending radii and temperature. The installation methods have to be in accordance with the common standards.
- If a cable needs to be fastened, constrictions ≥ 0.3 mm must be prevented.
- It is advisable to cap the cable-ends during storage.

- Mobile cable + N x fibre-type. Standard delivery lengths: 2100 ± 100 m

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