



European Edition

Optical Fibre Cables



Table of Contents

| | |
|--|----------------|
| General Information | 2 – 3 |
| Partnumber Reference | 4 – 6 |
| European Partnumber Coding | 6 |
| Universal (outdoor & indoor use) | |
| <i>also with improved rodent protection</i> | |
| <i>Multi-tube cables</i> | <i>7 – 8</i> |
| <i>Central tube cables, max. 24 fibres</i> | <i>9 – 10</i> |
| <i>Central tube cables, max. 12 fibres</i> | <i>11 – 12</i> |
| Outdoor | |
| <i>also with improved rodent protection</i> | |
| <i>Multi-tube cables</i> | <i>13 – 14</i> |
| <i>Central tube cables, max. 24 fibres</i> | <i>15 – 16</i> |
| Intex (for internal & external use) | |
| <i>Mini-Breakout (Distribution) cables</i> | <i>17 – 18</i> |
| Indoor | |
| <i>Mini-Breakout (Distribution) cables</i> | <i>19 – 20</i> |
| <i>Breakout cables</i> | <i>21 – 22</i> |
| <i>Interconnection (simplex & duplex) cables</i> | <i>23 – 24</i> |
| <i>Pigtails</i> | <i>25</i> |
| <i>Mobile cables</i> | <i>26</i> |



General Information

[Back to Content](#)

▶ *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.



▶ *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.

▶ *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*

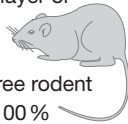
As all fibres show surface imperfections, Belden uses exclusively fibres with proof test-level $\geq 8.8 \text{ N} / \geq 1\% = \geq 100 \text{ kpsi}$. Therefore the expected lifetime of our optical fibre cables is [> 30 years](#).

General Information

[Back to Content](#)

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).





Partnumber Reference

[Back to Content](#)

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 | OM2 | MM 50/125 | | MM 62.5/125 OM1 | | |
| Intex Mini-Breakout with standard Rodent Protection page 17 and 18 | 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 | |
| | 24 | FRNC | GUMT924 | GUMT224 | GUMT424 | GUMT324 | GUMT124 | 2100 | |
| Intex Mini-Breakout with improved Rodent Protection (not listed in catalog) | 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 | |
| | 24 | FRNC | GUXT924 | GUXT224 | GUXT424 | GUXT324 | GUXT124 | 2100 | |
| Indoor Mini-Breakout with dry semi-tight buffered fibres (not listed in catalog) | 2 | FRNC | | GIMK202 | GIMK402 | GIMK302 | GIMK102 | 2100 | |
| | 4 | FRNC | | GIMK204 | GIMK404 | GIMK304 | GIMK104 | 2100 | |
| | 8 | FRNC | | GIMK208 | GIMK408 | GIMK308 | GIMK108 | 2100 | |
| Indoor Mini-Breakout with tight buffered fibres page 19 and 20 | 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 | |
| | 24 | FRNC | | GIMT224 | GIMT424 | GIMT324 | GIMT124 | 2100 | |
| Indoor Breakout with dry semi-tight buffered fibres (not listed in catalog) | 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 | |
| | 12 | FRNC | GIBK912 | GIBK212 | GIBK412 | GIBK312 | GIBK112 | 2100 | |
| Indoor Breakout with tight buffered fibres page 21 and 22 | 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 | |
| | 24 | FRNC | GIBT924 | GIBT224 | GIBT424 | GIBT324 | GIBT124 | 2100 | |
| Duplex Fig. 8 page 23 and 24 | 2 | FRNC | GIPS902 | GIPS202 | GIPS402 | GIPS302 | GIPS102 | 2100 | Duplex 2.8 mm MiniZip 1.6 – 1.8 mm |
| | 2 | FRNC | GIPT902 | GIPT202 | GIPT402 | GIPT302 | GIPT102 | 2100 | |
| Simplex 2.8 mm page 23 and 24 | 1 | FRNC | YE00126 | | | | | 2100 | Simplex ST Simplex-DST |
| | 1 | FRNC | YE00023 | | | | YE00045 | 2100 | |
| | 1 | FRNC | GIPS901 | GIPS201 | GIPS401 | GIPS301 | GIPS101 | 2100 | |
| | 1 | FRNC | YE00026 | | | | | 2100 | |
| | 1 | FRNC | YE00024 | | | | | 2100 | |
| Pigtails page 25 | 1 | TPE | GIOK901 | GIOK201 | GIOK401 | GIOK301 | GIOK101 | 2100 | Pigtails |
| | 1 | TPE | YE00021 | YE00039 | | | | 2100 | |
| | 1 | PA | YE00020 | | | | | 2100 | |
| Mobile cables page 26 | 4 | PUR | GMMT904 | GMMT204 | GMMT404 | GMMT304 | GMMT104 | 2100 | Mobile cables |
| | 6 | PUR | GMMT906 | GMMT206 | GMMT406 | GMMT306 | GMMT106 | 2100 | |
| | 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 |

Partnumber Reference

[Back to Content](#)

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 | OM2 | MM 50/125 OM2e | OM3 | MM 62.5/125 OM1 | | | | |
| Universal Multi-tube cables page 7 and 8 | 12 | 6*2 | GUSC912 | GUSC212 | GUSC412 | GUSC312 | GUSC112 | 4100 | Type-xxdcNH | | |
| | 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 | | | |
| | 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 | | | |
| | 144 | 12*12 | GUSF944 | GUSF244 | GUSF444 | GUSF344 | GUSF144 | 2100 | | | |
| | Universal Multi-tube cables with improved Rodent Protection page 7 and 8 | 24 | 2*12 | GURD924 | GURD224 | GURD424 | GURD324 | GURD124 | | 2100 | Type-xxdcHR |
| 36 | | 3*12 | GURD936 | GURD236 | GURD436 | GURD336 | GURD136 | 2100 | | | |
| 48 | | 4*12 | GURD948 | GURD248 | GURD448 | GURD348 | GURD148 | 2100 | | | |
| 60 | | 5*12 | GURD960 | GURD260 | GURD460 | GURD360 | GURD160 | 2100 | | | |
| 72 | | 6*12 | GURD972 | GURD272 | GURD472 | GURD372 | GURD172 | 2100 | | | |
| Universal Central tube (4.2 mm) cables page 9 and 10 | 4 | 1*4 | GUSB904 | GUSB204 | GUSB404 | GUSB304 | GUSB104 | 2100 | Type-24NH | | |
| | 6 | 1*6 | GUSB906 | GUSB206 | GUSB406 | GUSB306 | GUSB106 | 2100 | | | |
| | 8 | 1*8 | GUSB908 | GUSB208 | GUSB408 | GUSB308 | GUSB108 | 2100 | | | |
| | 12 | 1*12 | GUSB912 | GUSB212 | GUSB412 | GUSB312 | GUSB112 | 2100 | | | |
| | 16 | 1*16 | GUSB916 | GUSB216 | GUSB416 | GUSB316 | GUSB116 | 2100 | | | |
| | 24 | 1*24 | GUSB924 | GUSB224 | GUSB424 | GUSB324 | GUSB124 | 2100 | | | |
| Universal Central tube (4.2 mm) cables with improved Rodent Protection page 9 and 10 | 4 | 1*4 | GURB904 | GURB204 | GURB404 | GURB304 | GURB104 | 2100 | Type-24HR | | |
| | 6 | 1*6 | GURB906 | GURB206 | GURB406 | GURB306 | GURB106 | 2100 | | | |
| | 8 | 1*8 | GURB908 | GURB208 | GURB408 | GURB308 | GURB108 | 2100 | | | |
| | 12 | 1*12 | GURB912 | GURB212 | GURB412 | GURB312 | GURB112 | 2100 | | | |
| | 16 | 1*16 | GURB916 | GURB216 | GURB416 | GURB316 | GURB116 | 2100 | | | |
| | 24 | 1*24 | GURB924 | GURB224 | GURB424 | GURB324 | GURB124 | 2100 | | | |
| Universal Central tube (3.2 mm) cables page 11 and 12 | 2 | 1*2 | GUSA902 | GUSA202 | GUSA402 | GUSA302 | GUSA102 | 4100 | Type-12NH | | |
| | 4 | 1*4 | GUSA904 | GUSA204 | GUSA404 | GUSA304 | GUSA104 | 4100 | | | |
| | 6 | 1*6 | GUSA906 | GUSA206 | GUSA406 | GUSA306 | GUSA106 | 4100 | | | |
| | 8 | 1*8 | GUSA908 | GUSA208 | GUSA408 | GUSA308 | GUSA108 | 4100 | | | |
| | 12 | 1*12 | GUSA912 | GUSA212 | GUSA412 | GUSA312 | GUSA112 | 4100 | | | |
| Universal Central tube (3.2 mm) cables with improved Rodent Protection page 11 and 12 | 2 | 1*2 | GURA902 | GURA202 | GURA402 | GURA302 | GURA102 | 4100 | Type-12HR | | |
| | 4 | 1*4 | GURA904 | GURA204 | GURA404 | GURA304 | GURA104 | 4100 | | | |
| | 6 | 1*6 | GURA906 | GURA206 | GURA406 | GURA306 | GURA106 | 4100 | | | |
| | 8 | 1*8 | GURA908 | GURA208 | GURA408 | GURA308 | GURA108 | 4100 | | | |
| | 12 | 1*12 | GURA912 | GURA212 | GURA412 | GURA312 | GURA112 | 4100 | | | |
| | Outdoor Multi-tube cables page 13 and 14 | 12 | 6*2 | GOSC912 | GOSC212 | GOSC412 | GOSC312 | GOSC112 | | 4100 | Type-xxdcPE |
| 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 | | | |
| 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 | | | |
| 144 | | 12*12 | GOSF944 | GOSF244 | GOSF444 | GOSF344 | GOSF144 | 2100 | | | |
| Outdoor Multi-tube cables with improved Rodent Protection page 13 and 14 | | 12 | 6*2 | GORC912 | GORC212 | GORC412 | GORC312 | GORC112 | 4100 | Type-xxdcRP | |
| | | 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 | | | |
| | 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 | 2100 | | | |
| | 144 | 12*12 | GORF944 | GORF244 | GORF444 | GORF344 | GORF144 | 2100 | | | |
| | Outdoor Central tube (4.2 mm) cables page 15 and 16 | 4 | 1*4 | GOSB904 | GOSB204 | GOSB404 | GOSB304 | GOSB104 | 2100 | | Type-24PE |
| | | 6 | 1*6 | GOSB906 | GOSB206 | GOSB406 | GOSB306 | GOSB106 | 2100 | | |
| | | 8 | 1*8 | GOSB908 | GOSB208 | GOSB408 | GOSB308 | GOSB108 | 2100 | | |
| 12 | | 1*12 | GOSB912 | GOSB212 | GOSB412 | GOSB312 | GOSB112 | 2100 | | | |
| 16 | | 1*16 | GOSB916 | GOSB216 | GOSB416 | GOSB316 | GOSB116 | 2100 | | | |
| 24 | | 1*24 | GOSB924 | GOSB224 | GOSB424 | GOSB324 | GOSB124 | 2100 | | | |



Partnumber Reference

[Back to Content](#)

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 | OM2 | MM 50/125 | | MM 62.5/125 OM1 | | |
| Outdoor Central tube (4.2 mm) cables with improved Rodent Protection Bluelight page 15 and 16 | 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 | |
| | 24 | 1*24 | GORB924 | GORB224 | GORB424 | GORB324 | GORB124 | 2100 | |
| Outdoor Central tube (3.2 mm) cables (not listed in catalog) | 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 | |
| | 12 | 1*12 | GOSA912 | GOSA212 | GOSA412 | GOSA312 | GOSA112 | 4100 | |
| Outdoor Central tube (3.2 mm) cables with improved Rodent Protection (not listed in catalog) | 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 | |
| | 12 | 1*12 | GORA912 | GORA212 | GORA412 | GORA312 | GORA112 | 4100 | |
| Aerial cables (not listed in catalog) | 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 | |
| | 36 | 6*6 | GASC936 | GASC236 | GASC436 | GASC336 | GASC136 | 2100 | |
| Universal Central tube cables with Steel Wire Armouring (not listed in catalog) | 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 | |
| | 24 | 1*24 | GUWB924 | GUWB224 | GUWB424 | GUWB324 | GUWB124 | 2100 | |
| Outdoor Central tube cables with Steel Wire Armouring (not listed in catalog) | 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 | |
| | 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 | <i>Indoor</i> | S | <i>Stand. RP</i> | T | <i>Tight</i> | 1 | <i>62.5/125-OM1</i> | Fibre-count (144 = 44) |
| | O | <i>Outdoor</i> | R | <i>Impr. RP</i> | S | <i>Semi-tight</i> | 2 | <i>50/125-OM2</i> | |
| | U | <i>Universal</i> | W | <i>SWA</i> | K | <i>Dry semi-tight</i> | 3 | <i>50/125-OM3</i> | |
| | A | <i>Aerial</i> | P | <i>Patchcord</i> | A | <i>Central tube T12</i> | 4 | <i>50/125-OM2e</i> | |
| | M | <i>Mobile</i> | B | <i>Breakout</i> | B | <i>Central tube T24</i> | | | |
| | | | M | <i>Mini-Breakout</i> | C | <i>Multi-tube T48</i> | | | |
| | | | X | <i>Mini-BO+RP</i> | D | <i>Multi-tube T72</i> | 9 | <i>9/125-OS1</i> | |
| | | | O | <i>Pigtail</i> | E | <i>Multi-tube T96</i> | 0 | <i>No fibre, APF</i> | |
| | | | | | F | <i>Multi-tube T144</i> | | | |

Universal (outdoor & indoor use)

[Back to Content](#)

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

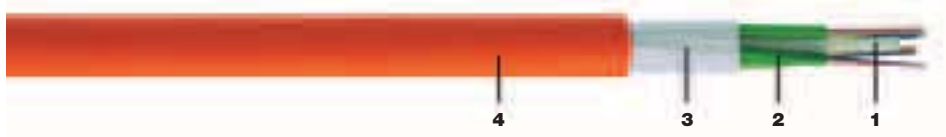
Application

- 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 ($\text{Ø } 250 \pm 15 \mu\text{m}$). 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)

[Back to Content](#)

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 OM1 | 62.5 ± 2.5 | 850 | 3.0/3.2 | ≥ 200 | 275 | 33 | 1.495 |
| 50 / 125 OM2 | 50 ± 2.5 | 850 | 2.5/2.7 | ≥ 600 | 550 | n.a. | 1.481 |
| 50 / 125 OM2e | 50 ± 2.5 | 850 | 2.5/2.7 | ≥ 600 | 750 | 110 | 1.481 |
| 50 / 125 OM3 | 50 ± 2.5 | 850 | 2.5/2.7 | ≥ 1500 | 900 | 300 | 1.482 |
| | 125 ± 1 | 1300 | 0.6/0.8 | ≥ 600 | 550 | n.a. | 1.490 |
| | 125 ± 1 | 1300 | 0.5/0.8 | ≥ 1200 | 550 | n.a. | 1.476 |
| | 125 ± 1 | 1300 | 0.5/0.8 | ≥ 1200 | 2000 | n.a. | 1.476 |
| | 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 OS1 | 9.2 ± 0.4 | 1310 | 0.33/0.38 | ≤ 3.5 | | 1.467 |
| | 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
- Watertightness** according to IEC 60794-1-2-F5
- Pulling tension** according to IEC 60794-1-2-E1
 - Type-48 and Type-72 ≤ 3000 N
 - Type-96 and Type-144 ≤ 4000 N
- 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 for fibres and tubes**
 - Installation/operation > 25 mm
- 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
- Halogen-free** according to IEC 60754-2 (HD 602)
 - Corrosivity pH ≥ 3.5 – µS/cm ≤ 100
- 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)

[Back to Content](#)

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

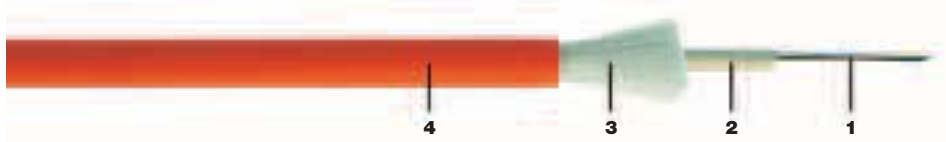
Application

- 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](#) than 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: $\varnothing 250 \pm 15 \mu\text{m}$.
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 |
|--|-----------|---|----|----|
| \varnothing Central tube (mm) | 4.2 | | | |
| with standard rodent protection | | | | |
| \varnothing nom./max. (mm) | 8.7/9.0 | | | |
| Weight (kg/km) | 72 | | | |
| Energy of flame (kJ/m) | 1370 | | | |
| with improved rodent protection | | | | |
| \varnothing 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)

[Back to Content](#)

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 OM1 | 62.5 ± 2.5 | 850 | 3.0/3.2 | ≥ 200 | 275 | 33 | 1.495 |
| 50 / 125 OM2 | 50 ± 2.5 | 850 | 2.5/2.7 | ≥ 600 | 550 | n.a. | 1.481 |
| 50 / 125 OM2e | 50 ± 2.5 | 850 | 2.5/2.7 | ≥ 600 | 750 | 110 | 1.481 |
| 50 / 125 OM3 | 50 ± 2.5 | 850 | 2.5/2.7 | ≥ 1500 | 900 | 300 | 1.482 |
| | 125 ± 1 | 1300 | 0.6/0.8 | ≥ 600 | 550 | n.a. | 1.490 |
| | 125 ± 1 | 1300 | 0.5/0.8 | ≥ 1200 | 550 | n.a. | 1.476 |
| | 125 ± 1 | 1300 | 0.5/0.8 | ≥ 1200 | 2000 | n.a. | 1.476 |
| | 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 OS1 | 9.2 ± 0.4 | 1310 | 0.33/0.38 | ≤ 3.5 | | 1.467 |
| | 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
- Watertightness** according to IEC 60794-1-2-F5
- Pulling tension** according to IEC 60794-1-2-E1
 - with standard RP ≤ 1400 N
 - with improved RP ≤ 4000 N
- Crush resistance** according to IEC 60794-1-2-E3
 - Cable ≤ 15000 N/m
- Bending radii for fibres and tubes**
 - Installation/operation > 25 mm
- 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
- Halogen-free** according to IEC 60754-2 (HD 602)
 - Corrosivity pH ≥ 3.5 – µS/cm ≤ 100
- 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)

[Back to Content](#)

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

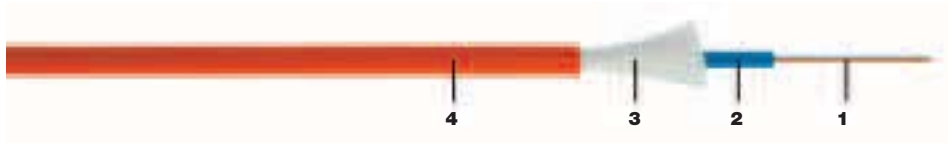
Application

- 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](#) than 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: $\text{Ø } 250 \pm 15 \mu\text{m}$.
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)

[Back to Content](#)

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 OM1 | 62.5 ± 2.5 125 ± 1 | 850 1300 | 3.0/3.2 0.6/0.8 | ≥ 200 ≥ 600 | 275 550 | 33 n.a. | 1.495 1.490 |
| 50 / 125 OM2 | 50 ± 2.5 125 ± 1 | 850 1300 | 2.5/2.7 0.5/0.8 | ≥ 600 ≥ 1200 | 550 550 | 82 n.a. | 1.481 1.476 |
| 50 / 125 OM2e | 50 ± 2.5 125 ± 1 | 850 1300 | 2.5/2.7 0.5/0.8 | ≥ 600 ≥ 1200 | 750 2000 | 110 n.a. | 1.481 1.476 |
| 50 / 125 OM3 | 50 ± 2.5 125 ± 1 | 850 1300 | 2.5/2.7 0.5/0.8 | ≥ 1500 ≥ 500 | 900 550 | 300 n.a. | 1.482 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 OS1 | 9.2 ± 0.4 125 ± 1 | 1310 1550 | 0.33/0.38 0.20/0.25 | ≤ 3.5 ≤ 18 | ≤ 0.2 | 1.467 1.467 |

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

Mechanical, physical and/or environmental

| | |
|---|--|
| <ul style="list-style-type: none"> ■ Temperature range according to IEC 60794-1-2-F1 <ul style="list-style-type: none"> Transport/storage -30 to +70 °C Installation -5 to +50 °C Operation -30 to +70 °C | <ul style="list-style-type: none"> ■ Watertightness according to IEC 60794-1-2-F5 |
| <ul style="list-style-type: none"> ■ Pulling tension according to IEC 60794-1-2-E1 <ul style="list-style-type: none"> with standard RP ≤ 700 N with improved RP ≤ 1400 N | <ul style="list-style-type: none"> ■ Crush resistance according to IEC 60794-1-2-E3 <ul style="list-style-type: none"> Central tube and cable ≤ 10000 N/m |
| <ul style="list-style-type: none"> ■ Bending radii for fibres and tubes <ul style="list-style-type: none"> Installation/operation > 25 mm | <ul style="list-style-type: none"> ■ Bending radii cable <ul style="list-style-type: none"> Static according to IEC 60794-1-2-E11 – 10 x Ø Dynamic according to IEC 60794-1-2-E6 – 15 x Ø |
| <ul style="list-style-type: none"> ■ Halogen-free according to IEC 60754-2 (HD 602) <ul style="list-style-type: none"> Corrosivity pH ≥ 3.5 – µS/cm ≤ 100 | <ul style="list-style-type: none"> ■ 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

[Back to Content](#)

Multi-tube Optical Fibre Cables • metal-free

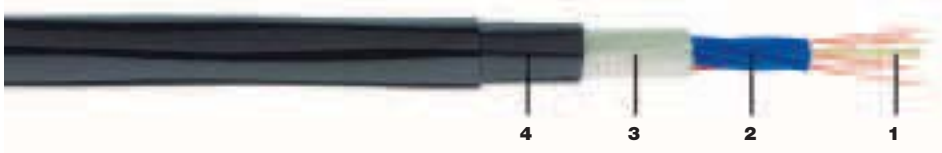
Application

- 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 ($\varnothing 250 \pm 15 \mu\text{m}$). 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

[Back to Content](#)

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 OM1 | 62.5 ± 2.5 | 850 | 3.0/3.2 | ≥ 200 | 275 | 33 | 1.495 |
| 50/125 OM2 | 50 ± 2.5 | 850 | 2.5/2.7 | ≥ 600 | 550 | n.a. | 1.481 |
| 50/125 OM2e | 50 ± 2.5 | 850 | 2.5/2.7 | ≥ 600 | 750 | 110 | 1.481 |
| 50/125 OM3 | 50 ± 2.5 | 850 | 2.5/2.7 | ≥ 1500 | 900 | 300 | 1.482 |
| | 125 ± 1 | 1300 | 0.6/0.8 | ≥ 600 | 550 | n.a. | 1.490 |
| | 125 ± 1 | 1300 | 0.5/0.8 | ≥ 1200 | 550 | n.a. | 1.476 |
| | 125 ± 1 | 1300 | 0.5/0.8 | ≥ 1200 | 2000 | n.a. | 1.476 |
| | 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 OS1 | 9.2 ± 0.4 | 1310 | 0.33/0.38 | ≤ 3.5 | | 1.467 |
| | 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
- **Watertightness** according to IEC 60794-1-2-F5
- **Pulling tension** according to IEC 60794-1-2-E1
 - Type-48 and Type-72 ≤ 3000 N
 - Type-96 and Type-144 ≤ 4000 N
- **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 for fibres and tubes**
 - Installation/operation > 25 mm
- **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

[Back to Content](#)

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

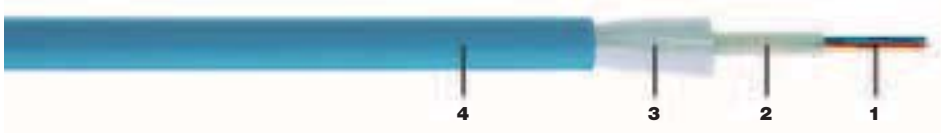
Application

- 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](#) than 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: $\text{Ø } 250 \pm 15 \mu\text{m}$.
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: Blueight \(improved rodent protection\)](#).
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

[Back to Content](#)

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 OM1 | 62.5 ± 2.5 | 850 | 3.0/3.2 | ≥ 200 | 275 | 33 | 1.495 |
| 50 / 125 OM2 | 50 ± 2.5 | 850 | 2.5/2.7 | ≥ 600 | 550 | n.a. | 1.481 |
| 50 / 125 OM2e | 50 ± 2.5 | 850 | 2.5/2.7 | ≥ 600 | 750 | 110 | 1.481 |
| 50 / 125 OM3 | 50 ± 2.5 | 850 | 2.5/2.7 | ≥ 1500 | 900 | 300 | 1.482 |
| | 125 ± 1 | 1300 | 0.6/0.8 | ≥ 600 | 550 | n.a. | 1.490 |
| | 125 ± 1 | 1300 | 0.5/0.8 | ≥ 1200 | 550 | n.a. | 1.476 |
| | 125 ± 1 | 1300 | 0.5/0.8 | ≥ 1200 | 2000 | n.a. | 1.476 |
| | 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 OS1 | 9.2 ± 0.4 | 1310 | 0.33/0.38 | ≤ 3.5 | | 1.467 |
| | 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
- Watertightness** according to IEC 60794-1-2-F5
- Pulling tension** according to IEC 60794-1-2-E1
 - with standard RP ≤ 1400 N
 - with improved RP ≤ 4000 N
- Crush resistance** according to IEC 60794-1-2-E3
 - Cable ≤ 15000 N/m
- Bending radii for fibres and tubes**
 - Installation/operation > 25 mm
- 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)

[Back to Content](#)

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)

- Swellable reinforced yarns as common strength members and for the longitudinal watertightness.
- Primary coated optical fibres: $\text{Ø } 280 \pm 15 \mu\text{m}$.
- Tight buffered fibres: $\text{Ø } 0.9 \pm 0.1 \text{ mm}$.
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.
- Swellable tape.
- [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)

[Back to Content](#)

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.

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 patchcord quality | 9.2 ± 0.4 125 ± 0.5 | 1310 1550 | 0.35/0.5 0.21/0.3 | ≤ 3.5 ≤ 18 | ≤ 0.2 | 1.467 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
- Strippability**
 - Secondary coating only ≤ 10 cm
 - Secondary + primary coating ≤ 10 mm
- Watertightness** according to IEC 60794-1-2-F5
- Pulling tension** according to IEC 60794-1-2-E1
see table with dimensions
- Crush resistance** according to IEC 60794-1-2-E3
 - Tight buffer ≤ 4000 N/m
 - Cable ≤ 4000 N/m
- Bending radii for fibres and tubes**
 - Installation/operation > 25 mm
- 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
- Halogen-free** according to IEC 60754-2 (HD 602)
Corrosivity pH ≥ 3.5 – µS/cm ≤ 100
- 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

[Back to Content](#)

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

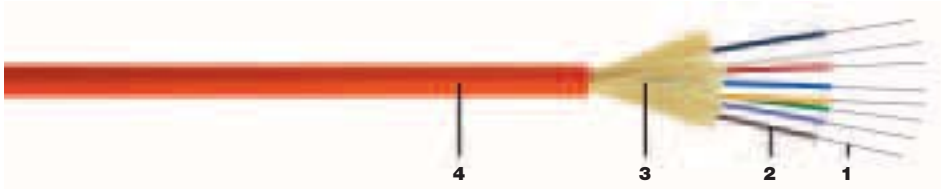
Application

- 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)

- Primary coated optical fibres: $\text{Ø } 280 \pm 15 \text{ }\mu\text{m}$.
- Tight buffered fibres: $\text{Ø } 0.9 \pm 0.1 \text{ mm}$.
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.
- Reinforced yarns as common strength members.
- [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

[Back to Content](#)

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
- Strippability**
 - Secondary coating only ≤ 10 cm
 - Secondary + primary coating ≤ 10 mm
- Pulling tension** according to IEC 60794-1-2-E1
 - See table with dimensions
- Crush resistance** according to IEC 60794-1-2-E3
 - Tight buffer ≤ 4000 N/m
 - Cable ≤ 4000 N/m
- Bending radii for fibres and tight buffers**
 - Installation/operation > 25 mm
- 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
- Halogen-free** according to IEC 60754-2 (HD 602)
 - Corrosivity pH ≥ 3.5 – µS/cm ≤ 100
- 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

[Back to Content](#)

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

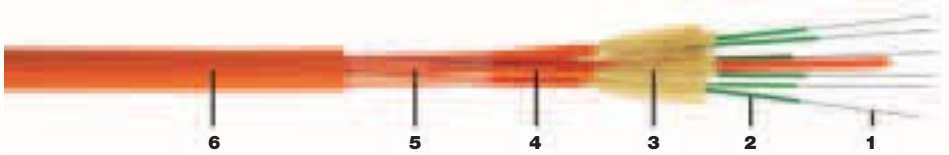
Application

- 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)

- Primary coated optical fibres: $\text{Ø } 280 \pm 15 \mu\text{m}$.
- Tight buffered fibres: $\text{Ø } 0.9 \pm 0.1 \text{ mm}$.
- Reinforced yarns as strength members.
- [Orange](#) halogen-free (FRNC/LSNH), numbered jacket ($\text{Ø } 2.1 \pm 0.2 \text{ mm}$).
- Tape.
- [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

[Back to Content](#)

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 OM1 | 62.5 ± 2.5 | 850 | 3.0/3.2 | ≥ 200 | 275 | 33 | 1.495 |
| 50 / 125 OM2 | 50 ± 2.5 | 850 | 2.6/2.8 | ≥ 600 | 550 | n.a. | 1.481 |
| 50 / 125 OM2e | 50 ± 2.5 | 850 | 2.6/2.8 | ≥ 600 | 750 | 110 | 1.481 |
| 50 / 125 OM3 | 50 ± 2.5 | 850 | 2.6/2.8 | ≥ 1500 | 900 | 300 | 1.482 |
| | 125 ± 1 | 1300 | 0.7/0.9 | ≥ 600 | 550 | n.a. | 1.490 |
| | 125 ± 1 | 1300 | 0.6/0.9 | ≥ 1200 | 550 | n.a. | 1.476 |
| | 125 ± 1 | 1300 | 0.6/0.9 | ≥ 1200 | 2000 | n.a. | 1.476 |
| | 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 patchcord quality | 9.2 ± 0.4 | 1310 | 0.35/0.5 | ≤ 3.5 | | 1.467 |
| | 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
- Strippability**
 - Secondary coating only ≤ 10 cm
 - Secondary + primary coating ≤ 10 mm
- Pulling tension** according to IEC 60794-1-2-E1
 - Single fibre unit 110 N
 - Cables: see table with dimensions
- 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 for fibres and tight buffers**
 - Installation/operation > 25 mm
- 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
- Halogen-free** according to IEC 60754-2 (HD 602)
 - Corrosivity pH ≥ 3.5 - µS/cm ≤ 100
- 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

[Back to Content](#)

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

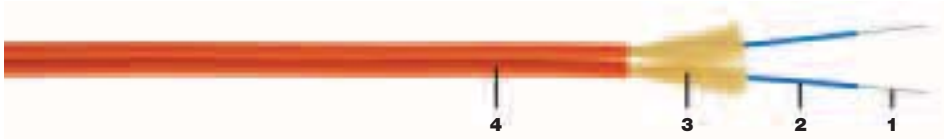
Application

- [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: $\text{Ø } 250 \pm 15 \text{ }\mu\text{m}$.
2. Semi-tight buffer: $\text{Ø } 0.9 \pm 0.1 \text{ mm}$.
 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 | $(2.8 \times 5.7) \pm 0.2$ |
| 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

[Back to Content](#)

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 OM1 | 62.5 ± 2.5 | 850 | 3.0/3.2 | ≥ 200 | 275 | 33 | 1.495 |
| 50 / 125 OM2 | 50 ± 2.5 | 850 | 2.6/2.8 | ≥ 600 | 550 | n.a. | 1.481 |
| 50 / 125 OM2e | 50 ± 2.5 | 850 | 2.6/2.8 | ≥ 600 | 750 | 110 | 1.481 |
| 50 / 125 OM3 | 50 ± 2.5 | 850 | 2.6/2.8 | ≥ 1500 | 900 | 300 | 1.482 |
| | 125 ± 1 | 1300 | 0.7/0.9 | ≥ 600 | 550 | n.a. | 1.490 |
| | 125 ± 1 | 1300 | 0.6/0.9 | ≥ 1200 | 550 | n.a. | 1.476 |
| | 125 ± 1 | 1300 | 0.6/0.9 | ≥ 1200 | 2000 | n.a. | 1.476 |
| | 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 patchcord quality | 9.2 ± 0.4 | 1310 | 0.35/0.5 | ≤ 3.5 | | 1.467 |
| | 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
- Strippability**
 - Secondary coating only ≤ 100 cm
 - Secondary + primary coating ≤ 25 mm
- Pulling tension** according to IEC 60794-1-2-E1
 - Semi-tight buffer ≤ 3 N
 - Simplex cable ≤ 200 N
 - Duplex cable ≤ 400 N
- 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 for fibres and tight buffers**
 - Installation/operation > 25 mm
- 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
- Halogen-free** according to IEC 60754-2 (HD 602)
 - Corrosivity pH ≥ 3.5 – µS/cm ≤ 100
- 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

[Back to Content](#)

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: $\varnothing 250 \pm 15 \mu\text{m}$.
2. Dry semi-tight buffer: $\varnothing 0.9 \pm 0.1 \text{ mm}$.

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/ $\sqrt{\text{km}}$) | Refractive Index |
|--------------------------|------------------------|-----------------|------------------------------------|---------------------------|-------------------------------|------------------|
| | | | | | | |
| 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 $+70 \text{ }^\circ\text{C}$ |
| Installation | -5 to $+50 \text{ }^\circ\text{C}$ |
| Operation | -5 to $+55 \text{ }^\circ\text{C}$ |

Strippability

| | |
|-----------------------------|-----------------------|
| Secondary coating only | $\leq 100 \text{ cm}$ |
| Secondary + primary coating | $\leq 25 \text{ mm}$ |

Pulling tension

$\leq 3 \text{ N}$

Crush resistance

according to IEC 60794-1-2-E3
Dry semi-tight buffer $\leq 4000 \text{ N/m}$

Bending radii for fibres and tight buffers

Installation / operation $> 25 \text{ mm}$

■ 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 \(\$\leq 10 \text{ m}\$ \) applications](#).

■ Dry semi-tight buffer + fibre-type

Standard delivery lengths: $2100 \pm 100 \text{ m}$

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



Specials

[Back to Content](#)

Mobile cables

Application

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

Construction & dimensions

Cable specifications

- Primary coated optical fibres: $\varnothing 280 \pm 15 \mu\text{m}$.
- Tight buffered fibres: $\varnothing 0.9 \pm 0.1 \text{ mm}$.
Colour coding of the buffered fibres: white – red – blue – yellow – green – violet – brown – black.
- Swellable reinforced yarns as common strength members and for the longitudinal watertightness.
- [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 |
|--------------------------|-----|-----|------|
| \varnothing 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 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 |

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 – $15 \times \varnothing$
Dynamic according to IEC 60794-1-2-E6 – $20 \times \varnothing$

- 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

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



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