

GCDE

Multi Loose Tube Cables

Universal – Indoor / Outdoor - Corrugated Steel Tape Armor (CST)

A/I-DQ(ZN)H(SR)H

Full Rodent Protection

2017-03-07 v10.0

Ordering Information

Belden European Part Numbers

| Fibre Description / count | 84 | 96 |
|---------------------------------------|--------------------------|---------|
| 62.5/125-OM1 | GCDE184 | GCDE196 |
| 50/125-OM2 BI | GCDE284 | GCDE296 |
| 50/125-OM3 BI | GCDED84 | GCDED96 |
| 50/125-OM4 BI | GCDEE84 | GCDEE96 |
| 9/125 ITU G.655 C&D | GCDE784 | GCDE796 |
| 9/125 ITU G.652D & G.657A1 BI | GCDE884 | GCDE896 |
| 9/125 ITU G.657A2 BI | GCDEF84 | GCDEF96 |
| 9/125 ITU G.657B3 BI | GCDEI84 | GCDEI96 |
| Std. plywood reel (non-returnable) | Ø 1250 * 688 mm 93 kg | |
| Std. delivery length | 2100 ± 105m | |

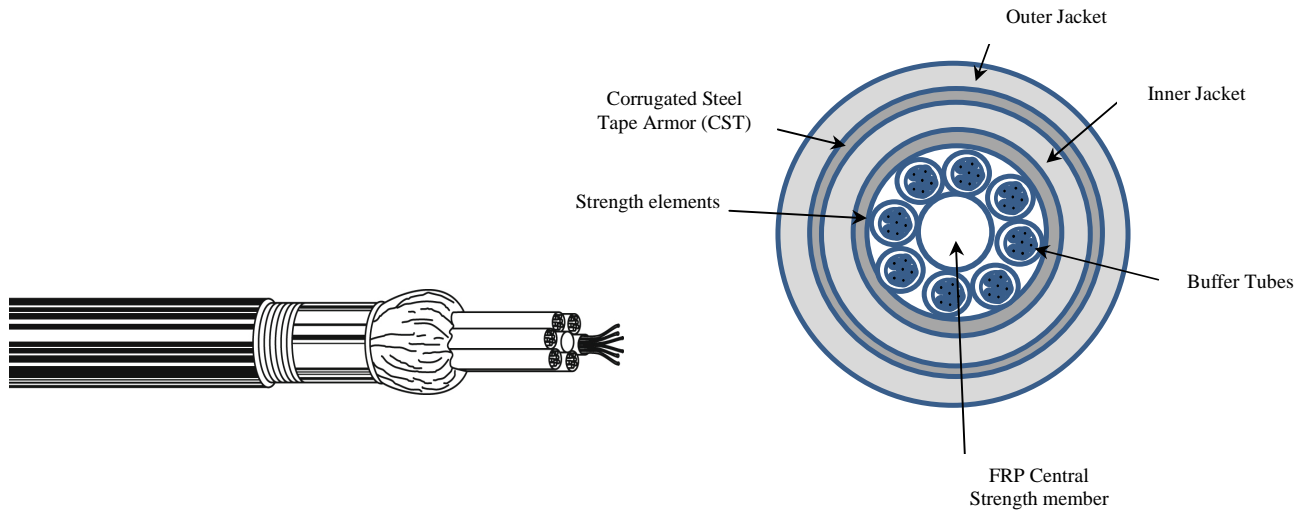
Applications

- For **outdoor and indoor** use in structured (data) wiring systems such as (**campus backbone**).
- For **outdoor and indoor** use in networks for telecom, cable TV and/or broadcast.
- Easy to install in ducts, tunnels and trenches by means of compressed air or pulling wire.
- Suitable for direct burial (crush ≤ 400 N/cm).

Features & Benefits

- **Installation friendly dry interstices** between the loose tubes.
- **High mechanical and full rodent protection** provided by corrugated steel tape (**CST**) armor.
- **Predicted lifetime > 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 yarns.
 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 – green – blue – yellow – violet – pink – orange – black – grey – brown – white – turquoise.
 3. The loose tubes are stranded around the central element, if necessary with fillers (PE-natural), surrounded by swelling tape.
Colour coding of the loose tubes: 1. red – 2. green – rest white.
 4. Swellable (for the longitudinal watertightness) aramid yarns as strength members.
 5. FRNC/LSNH inner jacket.
 6. Corrugated Steel Tape Armoring (CST): longitudinally applied steel tape (0.155 mm).
 7. UV resistant FRNC/LSNH outer jacket.
- Identification: BELDEN OFC – “cable type” – “number x fibre type” + date-, meter- and P/N marking.

Mechanical Data

| No. of fibres | Max. 96 |
|------------------------|-------------|
| Cable core | 8 tubes |
| Ø Central element (mm) | 3.0/4.3 |
| Ø Loose tube (mm) | 2.5 |
| Ø nom./max. (mm) | 17.4 / 17.7 |
| Energy of flame (kJ/m) | 4700 |
| Weight (kg/km) | 340 |

Optical Characteristics

Characteristics Single-Mode – Matched-Cladded optical fibres according to ITU.

| European P/N Coding, Position 5 | Fibre-Type | Mode-Field /Cladding Diameter (um) | Wave-length (nm) | Attenuation ^B typical/ max. (dB/km) | Dispersion (ps/(nm·km)) | PMD ^A (ps/√km) | Cable Cut-off Wave-length (nm) |
|---------------------------------|--|------------------------------------|----------------------|--|-------------------------|---------------------------|--------------------------------|
| 7 | 9/125 G.655 C&D | 8.4 ± 0.6 125 ± 0.7 | 1550 1625 | 0.2 / 0.22 0.21 / 0.24 | ≤ 4.5 ≤ 7.9 | ≤ 0.04 | ≤ 1260 |
| 8 | 9/125 G.652D & G.657A1 BI OS2 | 9.2 ± 0.4 125 ± 0.7 | 1310 1550 1625 | 0.33 / 0.34 0.18 / 0.19 0.20 / 0.24 | ≤ 3.2 ≤ 17 | ≤ 0.06 | ≤ 1260 |
| F | 9/125 G.657A2 BI | 8.9 ± 0.4 124.8 ± 0.3 | 1310 1550 1625 | 0.34 / 0.35 0.19 / 0.21 0.20 / 0.24 | ≤ 3.5 ≤ 18 | ≤ 0.2 | ≤ 1260 |
| I | 9/125 G.657B3 BI | 8.8 ± 0.4 125 ± 0.4 | 1310 1550 1625 | 0.34 / 0.35 0.19 / 0.21 0.20 / 0.23 | ≤ 3.5 ≤ 18 | ≤ 0.06 | ≤ 1260 |

Note A- Link design value

Note B- Due to cabling the optical attenuation values can increase with max. 0.05 dB/km

Characteristics Multi-Mode Graded-Index optical fibres according to IEC 60793

| European P/N Coding, Position 5 | Fibre-Type | Core/ Cladding Diameter (um) | Wave-length (nm) | Attenuation ^C typical/ max. (dB/km) | Bandwidth (MHz·km) | Ethernet Performance (m) | | Num. Apert. (µm) |
|---------------------------------|------------------|------------------------------|------------------|--|--------------------|--------------------------|------------|---------------------|
| | | | | | | 1 GBE | 10 GBE | |
| 1 | 62.5/125 OM1 | 62.5 ± 2.5 125 ± 1 | 850 1300 | 2.7 / 3.0 0.7 / 0.8 | ≥ 200 ≥ 600 | 220 550 | 33 300 | 0.275 ± 0.015 |
| 2 | 50/125 OM2 BI | 50 ± 2.5 125 ± 1 | 850 1300 | 2.3 / 2.5 0.5 / 0.6 | ≥ 500 ≥ 500 | 600 600 | 83 300 | 0.20 ± 0.015 |
| D | 50/125 OM3 BI | 50 ± 2.5 125 ± 1 | 850 1300 | 2.3 / 2.5 0.5 / 0.6 | ≥ 1500 ≥ 500 | 1000 550 | 300 300 | 0.20 ± 0.015 |
| E | 50/125 OM4 BI | 50 ± 2.5 125 ± 1 | 850 1300 | 2.3 / 2.5 0.5 / 0.6 | ≥ 3500 ≥ 500 | 1100 550 | 550 300 | 0.20 ± 0.015 |

Note C- Due to cabling the optical attenuation values can increase with max. 0.4 dB/km

Macro Bending Performance Fibers

Maximum attenuation increase for Bend Insensitive Single Mode fibers in dB depending on turns and radius.

| European P/N Coding, Position 5 | Fibre-Type | Wave-length (nm) | Turns 100 Radius 30 mm (dB) | Turns 10 Radius 15 mm (dB) | Turn 1 Radius 16 mm (dB) | Turn 1 Radius 10 mm (dB) | Turn 1 Radius 7.5 mm (dB) | Turn 1 Radius 5 mm (dB) |
|---------------------------------|-------------------------------|------------------|-----------------------------|----------------------------|--------------------------|--------------------------|---------------------------|-------------------------|
| 7 | 9/125 G.655 C & D | 1550 1625 | 0.05 0.05 | | 0.5 0.5 | | | |
| 8 | 9/125 G.652D & G.657A1 BI OS2 | 1550 1625 | 0.03 0.03 | 0.25 1.0 | | 0.75 1.5 | | |
| F | 9/125 G.657A2 BI | 1550 1625 | | 0.03 0.1 | | 0.1 0.2 | 0.5 1.0 | |
| I | 9/125 G.657B3 BI | 1550 1625 | | | | 0.03 0.1 | 0.08 0.25 | 0.15 0.45 |

Maximum attenuation increase for Bend Insensitive Multi Mode fibers in dB depending on turns and radius.

| European P/N Coding, Position 5 | Fibre-Type | Wave-length (nm) | Turns 100 Radius 37.5 mm (dB) | Turns 2 Radius 15 mm (dB) | Turns 2 Radius 7.5 mm (dB) |
|---------------------------------|---------------|------------------|-------------------------------|---------------------------|----------------------------|
| 1 | 62.5/125 OM1 | 850 1300 | 0.5 0.5 | | |
| 2 | 50/125 OM2 BI | 850 1300 | 0.5 0.5 | 0.1 0.3 | 0.2 0.5 |
| D | 50/125 OM3 BI | 850 1300 | 0.5 0.5 | 0.1 0.3 | 0.2 0.5 |
| E | 50/125 OM4 BI | 850 1300 | 0.5 0.5 | 0.1 0.3 | 0.2 0.5 |

Mechanical, Physical and/or Environmental Characteristics

| Description: | Tested according to: | Requirement: | According to Family specification: |
|---|----------------------|------------------|------------------------------------|
| Storage Temperature Range | IEC 60794-1-22-F1 | -30 to +70 °C | IEC 60794-3-10 |
| Installation Temperature Range | | -5 to +40 °C | |
| Operating Temperature Range | | -30 to +70 °C | |
| Bending Radius Tube (Installation and Operation) | | > 25 mm | |
| Cable Core Water Blocking | IEC 60794-1-22-F5 | Pass | |
| Cable Min. Bend Radius Operation (Long Term) | IEC 60794-1-21-E11 | 20 x Cable Diam. | IEC 60794-3-10 |
| Cable Min. Bend Radius Installation (Short Term) | IEC 60794-1-21-E6 | 20 x Cable Diam. | |
| Cable Max. Tensile Strength Operation (Long Term) | IEC 60794-1-21-E1 | 950 N | IEC 60794-3-10 |
| Cable Max. Tensile Strength Installation (Short Term) | | 2900 N | |
| Cable Max. Crush Resistance Operation (Long Term) | IEC 60794-1-21-E3 | 11 kN/m | IEC 60794-3-10 |
| Cable Max. Crush Resistance Installation (Short Term) | | 22 kN/m | |

Safety

| | Testing standard | Description / Value |
|-----------------------------------|-------------------------------|------------------------------|
| Reaction to fire | IEC 60332-1 IEC 60332-3-22 | |
| Toxicity | NF X 70-100-2 | |
| Halogen acid gas content | IEC 60754-1 | Zero |
| Degree of acidity of gases | IEC 60754-2 IEC 60754-2 | Min. 4.3 pH Max. 10 µS/mm |

Guide to installation and handling

- When laying and installing optical fibre cables it is **vitaly 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.

Options

- Cables for outdoor use only.
- **Non-standard cable constructions**, colours, details and/or additional information regarding specifications are available on request.