

## GUSB

### Central Loose Tube Cables Universal – Indoor/ Outdoor A/I-DQ(ZN)BH

Standard Rodent Protection  
2017-03-07 v9.0

### Ordering Information

#### Belden European Part Numbers

Fibre Description / count	4	6	8	12	16	24
62.5/125-OM1	GUSB104	GUSB106	GUSB108	GUSB112	GUSB116	GUSB124
50/125-OM2 BI	GUSB204	GUSB206	GUSB208	GUSB212	GUSB216	GUSB224
50/125-OM3 BI	GUSBD04	GUSBD06	GUSBD08	GUSBD12	GUSBD16	GUSBD24
50/125-OM4 BI	GUSBE04	GUSBE06	GUSBE08	GUSBE12	GUSBE16	GUSBE24
9/125 ITU G.655 C&D	GUSB704	GUSB706	GUSB708	GUSB712	GUSB716	GUSB724
9/125 ITU G.652D & G.657A1 BI	GUSB804	GUSB806	GUSB808	GUSB812	GUSB816	GUSB824
9/125 ITU G.657A2 BI	GUSBF04	GUSBF06	GUSBF08	GUSBF12	GUSBF16	GUSBF24
9/125 ITU G.657B3 BI	GUSBI04	GUSBI06	GUSBI08	GUSBI12	GUSBI16	GUSBI24
Std. plywood reel (non-returnable)	Ø 1000 * 530mm 18 kg					
Std. delivery length	2100 ± 105m					

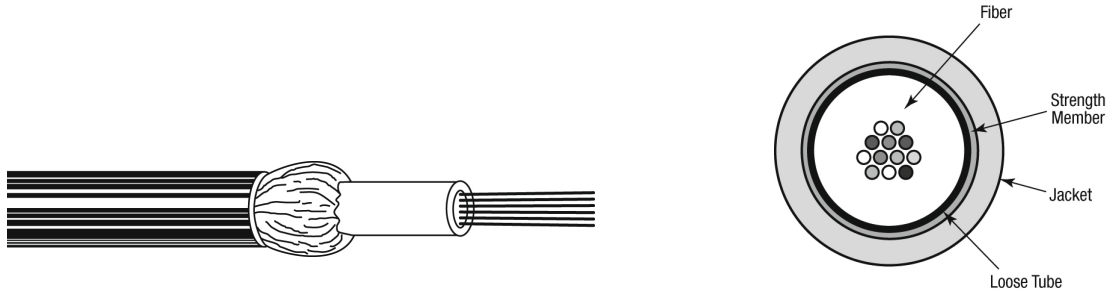
### Applications

- For **outdoor and indoor** use in structured (data) wiring systems such as **campus backbone, building backbone** (riser) and/or Horizontal cabling.
- For **outdoor and indoor** use in networks for Telecom, Cable TV and/or Broadcast.
- **Easy to install** in ducts, tunnels and trenches and/or tubes (by means of compressed air or pulling wire). Suitable for **direct burial**.

### Features & Benefits

- 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 **all dielectric** cable construction (and consequently **more cost-effective up to 24 fibres** than multi-tube cables) with standard rodent protection.
- **Predicted lifetime > 30 years.**

## Construction & Dimensions



### Cable Specifications (construction in accordance with IEC 60794)

1. Primary coated optical fibres:  $\text{Ø } 250 \pm 15 \text{ um}$ .
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 rings.
3. Swellable (for the longitudinal watertightness) glass yarns as strength members and for the standard rodent protection.
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	Max. 24
Ø Central tube (mm)	4.2
Ø nom./max. (mm)	8.7 / 9.0
Energy of flame (kJ/m)	1370
Weight (kg/km)	72

## 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 <sup>B</sup> typical/ max. (dB/km)	Dispersion (ps/(nm·km))	PMD <sup>A</sup> (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 <sup>C</sup> 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 Water Blocking	IEC 60794-1-22-F5	Pass	
Cable Min. Bend Radius Operation (Long Term)	IEC 60794-1-21-E11	10 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	1250 N	IEC 60794-3-10
Cable Max. Tensile Strength Installation (Short Term)		3750 N	
Cable Max. Crush Resistance Operation (Long Term)	IEC 60794-1-21-E3	7.5 kN/m	IEC 60794-3-10
Cable Max. Crush Resistance Installation (Short Term)		15 kN/m	

## Safety

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

## Guide to installation and handling

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- 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

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