GWRT

Windmill Tower Cable
Mobile, Tactical – Indoor/ Outdoor, Heavy Duty
A/I-VQ(ZN)11Y(ZN)11Y
Improved Rodent Protection
2015-12-11 v16.0

Ordering Information

Belden European Part Numbers

Fibre Description / count	4	8	12
62.5/125-OM1	GWRT104	GWRT108	GWRT112
50/125-OM2 BI	GWRT204	GWRT208	GWRT212
50/125-OM3 BI	GWRTD04	GWRTD08	GWRTD12
50/125-OM4 BI	GWRTE04	GWRTE08	GWRTE12
9/125 ITU G.657A1 BI	GWRTA04	GWRTA08	GWRTA12
9/125 ITU G.657A2 BI	GWRTF04	GWRTF06	GWRTF08
9/125 ITU G.657B3 BI	GWRTI04	GWRTI06	GWRTI08
Std. plywood reel (non-returnable)	Ø1000*588mm 50kg		
Std. delivery length	2100 ± 105m		

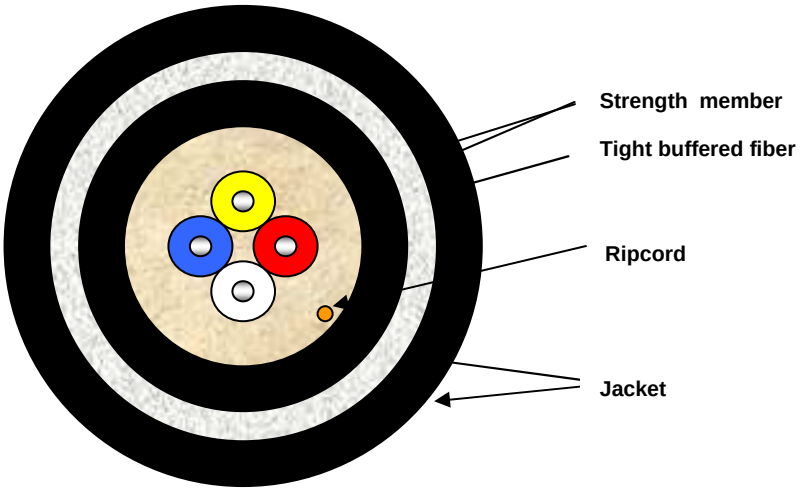
Applications

- Flexible cable is suitable for use in Windmill Towers, vertical installation.
- These cables are flame retardant and watertight and therefore suitable for indoor and outdoor use.
- Not recommended for direct burial.
- Glassrovings between inner- and outer-jacket for improved **Rodent protection.**
- High abrasion- and chemical resistance against oil, acids and alkalies.

Features & Benefits

- These cables are **halogenfree** and **metalfree** (all dielectric).
- **Predicted lifetime > 30 years**.

Construction & Dimensions



Cable Specifications (construction in accordance with IEC 60794)

1. Primary coated optical fibres: Ø 280 ± 15 µm.
2. Tight buffered fibres: Ø 0.90 ± 0.05 mm. Colour coding of the buffered fibres: white – red – blue – yellow – green – violet – brown – black – orange– turquoise – pink – grey.
3. Swellable aramid yarns as common strength members and for the longitudinal watertightness.
4. **Black Polyurethane** inner jacket with (polyester) rip cord..
5. Swellable glassyarns as additional **strength members** and for **rodent protection.**
6. **Black Polyurethane** outer jacket.

Identification: BELDEN OFC – HEAVY DUTY TACTICAL CABLE – ”number x type of fibre” +date-, meter- and P/N-marking.

Mechanical Data

No. of fibres	4	8	12
Ø Inner jacket nom. (mm)	5.8	7.0	8.2
Ø Outer jacket nom. (mm)	9.2	10.0	11.2
Max. pulling tension (N) Short term	880	990	1260
Energy of flame (kJ/m)	1180	1690	2270
Weight (kg/km)	88	99	126

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)
A	**9/125 G.657A1 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	≤ 0.06	≤ 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	≤ 0.06	≤ 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 0.15 dB/km (1310 nm), max. 0.09 dB/km (1550 nm) and max. 0.27 dB/km (1625 nm)

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 25 mm (dB)	Turns 10 Radius 15 mm (dB)	Turn 1 Radius 10 mm (dB)	Turn 1 Radius 7.5 mm (dB)	Turn 1 Radius 5 mm (dB))
A	9/125 G.657A1	1550 1625	0.01 0.05	0.2 0.5	0.2 0.5		
F	9/125 G.657A2	1550 1625		0.03 0.1	0.1 0.2	0.5 1.0	
I	9/125 G.657B3	1550 1625			0.03 0.10	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 Installation Temperature Range Operating Temperature Range	IEC 60794-1-22-F1	-70 to +85 °C -5 to +50 °C -55 to +85 °C	IEC 60794-2-20
Strippability Secondary coating only Secondary + primary coating Jacket		 ≤ 10 cm ≤ 10 mm > 50 cm (using ripcord)	
Bending radii for fibres and tight buffers Installation/operation For Bend Insensitive fibres		 >25 mm See Optical Characteristics	
Cable Water Blocking	IEC 60794-1-22-F5	Pass	
Cable Min. Bend Radius Operation (Long Term) Cable Min. Bend Radius Installation (Short Term)	IEC 60794-1-21-E11 IEC 60794-1-21-E6	4 x Cable Diam. 8 x Cable Diam.	
Repeated bending	IEC 60794-1-21-E6	> 700.000 cycles	
Torsion , cable +/- 130˚/m at -40˚C	IEC 60794-1-2-E7	20000 cycles (load: 55N)	
Oil resistance, IRM902 aging 100°C/7days		Tensile strength decrease -16.4% Elongation decrease -9.3%	
Self carrying length		> 100m (hanging)	
Cable Max. Tensile Strength Operation (Short Term)	IEC 60794-1-21-E1	See table with dimensions	IEC 60794-2-20
Cable Max. Crush Resistance Operation (Long Term) Cable Max. Crush Resistance Installation (Short Term)	IEC 60794-1-21-E3	3 kN/m 5 kN/m	IEC 60794-2-20

Safety

	Testing standard	Description / Value
Reaction to fire	IEC 60332-1 FT 1 UL 1685 IEC 60332-3-24	
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 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.
- It is advisable to cap the cable-ends during storage