

## GM TT

**Mini-Breakout Cables (Distribution)**  
**Mobile, Tactical – Indoor/ Outdoor,**  
**A/I-VQ(ZN)11Y**  
2015-10-28 v15.0

### Ordering Information

#### Belden European Part Numbers

Fibre Description / count	1	2	4	6	8	12	24
62.5/125-OM1	GM TT101	GM TT102	GM TT104	GM TT106	GM TT108	GM TT112	GM TT124
50/125-OM2 BI	GM TT201	GM TT202	GM TT204	GM TT206	GM TT208	GM TT212	GM TT224
50/125-OM3 BI	GM TTD01	GM TTD02	GM TTD04	GM TTD06	GM TTD08	GM TTD12	GM TTD24
50/125-OM4 BI	GM TTE01	GM TTE02	GM TTE04	GM TTE06	GM TTE08	GM TTE12	GM TTE24
9/125 ITU G.657A1 BI	GM TTA01	GM TTA02	GM TTA04	GM TTA06	GM TTA08	GM TTA12	GM TTA24
9/125 ITU G.657A2 BI	GM TTF01	GM TTF02	GM TTF04	GM TTF06	GM TTF08	GM TTF12	GM TTF24
9/125 ITU G.657B3 BI	GM TTI01	GM TTI02	GM TTI04	GM TTI06	GM TTI08	GM TTI12	GM TTI24
Std. plywood reel (non-returnable)	Ø 560 * 336 mm 4.25 kg			Ø 800 * 475 mm 7.65 kg			
Std. delivery length	2100 ± 105m						

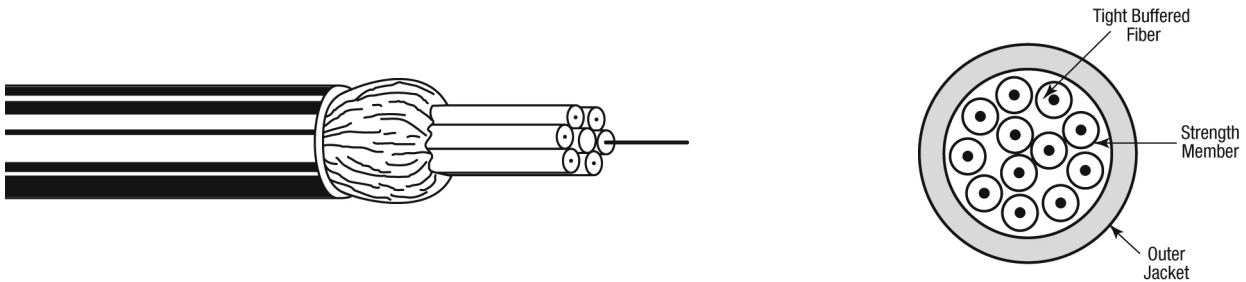
### Applications

- These metal-free mobile cables have been designed for de-spooling and re-spooling repeatedly.
- Support computer network applications such as FDDI, Gigabit Ethernet and ATM.
- **Easy to install.** Not recommended for direct burial.

### Features & Benefits

- Extremely strong, rugged, survivable tight-buffered cables for severe environments.
- These cables are halogenfree, flame retardant and watertight and therefore suitable for indoor and outdoor use.
- Helically stranded cable core for flexibility and outstanding mechanical protection for the fibers.
- Core-bonded Polyurethane jacket providing simple installation.
- **Predicted lifetime > 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:  $\text{Ø } 0.90 \pm 0.05 \text{ mm}$ . Colour coding of the buffered fibres:  
white – red – blue – yellow – green – violet – brown – black – orange – turquoise – pink – grey.  
the secondary coating of fibres 1 – 12 is coloured  
the primary coating of fibres 13 – 24 is coloured (with the same colour sequence) and the secondary coating is transparent. Only 12 core cable contains fibres with coloured primary and coloured secondary coating

No. of fibres	2	4	6	12	13-16	13-24
Primary coating of fibres (280 $\mu\text{m}$ )	transparent	transparent	transparent	coloured	coloured	coloured
Secondary coating of fibres (900 $\mu\text{m}$ )	coloured	coloured	coloured	coloured	transparent	transparent

- Swellable aramid yarns as common strength members and for the longitudinal watertightness.
- Black Polyurethane** outer jacket with (polyester) rip cord.  
Identification: BELDEN OFC – TACTICAL CABLE – "number x type of fibre" +date-, meter- and P/N-marking.

## Mechanical Data

No. of fibres	1	2	4	6	8	12	16	24
$\text{Ø}$ Outer jacket nom. (mm)	5.4	5.4	5.8	7.0	7.0	8.2	8.3	8.5
Max. pulling tension (N) Short term	400	400	400	400	410	600	640	710
Energy of flame (kJ/m)	440	470	580	725	780	1270	1381	1567
Weight (kg/km)	26	27	31	40	41	60	64	71

## 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)
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 <sup>C</sup> typical/ max. (dB/km))	Bandwidth (MHz•km)	Ethernet Performance (m)		Num. Apert. (um)
						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		≤ 10 cm ≤ 10 mm	
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)	IEC 60794-1-21-E11	4 x Cable Diam.	
Cable Min. Bend Radius Installation (Short Term)	IEC 60794-1-21-E6	8 x Cable Diam.	
Repeated bending	IEC 60794-1-21-E6	> 700.000 cycles	
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)	IEC 60794-1-21-E3	3 kN/m	IEC 60794-2-20
Cable Max. Crush Resistance Installation (Short Term)		5 kN/m	

## Safety

	Testing standard	Description / Value
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

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- 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  $\geq 0.3$  mm must be prevented.
- It is advisable to cap the cable-ends during storage.

## Options

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