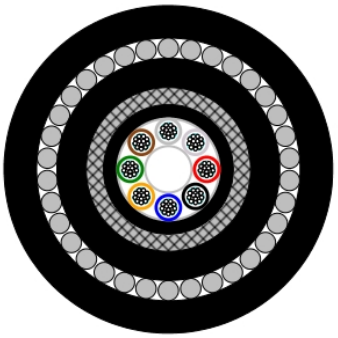
MINESHAFT FIBRE OPTIC CABLE

Applications

- Vertical installations or shaft in mines
- The low smoke fire retardant zero halogen non-toxic triple sheath design ensures maximum safety for a restricted area cabling system



Construction

GRP/FRP	Glass reinforced plastic central strength, PE over sheathed in certain cases
Loose tube	PBT(polybutylene terephthalate) filled with thixotropic gel.
Fibers	12 color coated fibers per tube
Sheath	Low Smoke Zero Halogen(LSZH)
Armoring	Corrugated steel tape
Sheathing	Low Smoke Zero Halogen(LSZH)
Armoring	Steel wire armor
Sheathing	Low Smoke Zero Halogen(LSZH)

Mechanical properties

Fibre count	Number of elements	Cable diameter nominal (mm)	Cable weight (kg/ km)	Maximum installation load (N)	Operation Temperature Range	Bending radius	
						Long term	Short term
Up to 72	6	14.2	185	1800	-10°C to 70° C	20 x OD	12 x OD
96	8	16.6	230	1800	-10°C to 70° C	20 x OD	12 x OD

Fibre and tube colours as per TIA/EIA

1	Blue	2	Orange	3	Green	4	Brown	5	Grey	6	White
7	Red	8	Black	9	Yellow	10	Violet	11	Pink	12	Turquoise

Ordering information

Fibre count	Cable type	Fibre type ITU-T	Drum quantity(m)	Customer
24	Mineshaft(Shaft)	G657.A1	4000	CBI

Optical properties (Bend tolerant Multi Mode)					
Characteristics			**ITU-T G.651 OM2**	**ITU-T G.651 OM3**	**ITU-T G.651 OM4**
Fibre core diameter (µm)			50.0 ± 2.5	50.0 ± 2.5	50.0 ± 2.5
Cabled Attenuation (dB/km)		850nm	≤ 3	≤ 2.5	≤ 2.5
		1300nm	≤ 1	≤ 0.7	≤ 0.7
Macro-bend loss		850nm	Ø15mm, 2turn, ≤ 0.2dB	Ø15mm, 2turn, ≤ 0.2dB	Ø15mm, 2turn, ≤ 0.2dB
			Ø30mm, 2turns, ≤ 0.1dB	Ø30mm, 2turns, ≤ 0.1dB	Ø30mm, 2turns, ≤ 0.1dB
			Ø75mm, 100turns, ≤ 0.05dB	Ø75mm, 100turns, ≤ 0.05dB	Ø75mm, 100turns, ≤ 0.05dB
		1300nm	Ø15mm, 2turn, ≤ 0.5dB	Ø15mm, 2turn, ≤ 0.5dB	Ø15mm, 2turn, ≤ 0.5dB
			Ø30mm, 2turns, ≤ 0.3dB	Ø30mm, 2turns, ≤ 0.3dB	Ø30mm, 2turns, ≤ 0.3dB
			Ø75mm, 100turns, ≤ 0.15dB	Ø75mm, 100turns, ≤ 0.15dB	Ø75mm, 100turns, ≤ 0.15dB
Bandwidth	High Performance EMB* (MHz.km)		950@850nm	2000@850nm	4700@850nm
			-	-	-
	Legacy Performance EMB** (MHz.km)		700@850nm	1500@850nm	3500@850nm
			500@1300nm	500@1300nm	500@1300nm
Optimised data Rate over distance			-	40/100 Gb/s over 140m***	40/100 Gb/s over 170m***
			10 Gb/s over 150m	10 Gb/s over 300m	10 Gb/s over 550m
			1Gb/s over 750m	1Gb/s over 1000m	1Gb/s over 1100m
Cladding diameter (µm)			125 ± 1	125 ± 1	125 ± 1
Cladding non circularity (%)			≤ 1	≤ 1	≤ 1
Core-Clad concentricity (µm)			≤ 1.5	≤ 1.5	≤ 1.5
Cable cut-off wavelength (nm)				≤ 1260	≤ 1260
* Ensured via minEMBc,per TIA 455-22A and IEC 60793-1-49, for high performance laser-based systems (up to 100Gb/s)					
** OFLBW, per TIA/EIA 455-2-4 and IEC 60793-1-41, for legacy and LED-based systems (typically up to 100Mb/s)					
*** Distances specified in the 40G/100G per IEEE 802.3ba standard are 150m for OM4 and 100m for OM3. (For these distances cabled attenuation ≤ 3.0dB/km and 1.0dB of connector loss is assumed.)					

Optical properties			
Characteristics		**ITU-T.652D**	**ITU-T.657A1**
Modefield diameter (µm)	1310nm	9.2 ± 0.4	9.2 ± 0.4
	1550nm	10.4 ± 0.5	10.4 ± 0.5
Cabled Attenuation (dB/km)	1310nm	≤ 0.34	± 0.34
	1550nm	≤ 0.20	± 0.20
Polarization Mode Dispersion (ps/√km)	Link (PMDQ)	≤ 0.04	≤ 0.04
	Individual PMDmax)	≤ 0.1	≤ 0.1
Chromatic dispersion (ps/nm.km)	1285-1330nm	|3|	|3|
	1550nm	≤ 18	≤ 18
	1625nm	≤ 22	≤ 22
Macro-bend loss	1550nm	Ø32mm, 1turn, ≤ 0.03dB	Ø10mm, 1turn, ≤ 0.5dB
		Ø50mm, 100turns, ≤ 0.03dB	Ø15mm, 10turns, ≤ 0.05dB
			Ø25mm, 100turns, ≤ 0.01dB
	1625nm		Ø10mm, 1turn, ≤ 1.5dB
			Ø15mm, 10turns, ≤ 0.3dB
		Ø50mm, 100turns, ≤ 0.03dB	Ø25mm, 100turns, ≤ 0.01dB
Cladding diameter (µm)		125 ± 0.7	125 ± 0.7
Cladding non circularity (%)		≤ 0.7	≤ 1
Core-Clad concentricity (µm)		≤ 0.5	≤ 0.6
Cable cut-off wavelength (nm)		≤ 1260	≤ 1260
Local variations: cabled (dB)		≤ 0.1@1550nm	≤ 0.1@1550nm
Characteristics		**ITU-T.655D**	**ITU-T.656**
Modefield diameter (µm)	nm		
	1550nm	9.6 ± 0.5	9 ± 0.5
Cabled Attenuation (dB/km)	1550nm	≤ 0.22	≤ 0.23
	1625nm	≤ 0.25	≤ 0.26
Polarization Mode Dispersion (ps/√km)	Link (PMDQ)	≤ 0.04	≤ 0.08
	Individual PMDmax)	≤ 0.1	≤ 0.2
Chromatic dispersion (ps/nm.km)	1530nm	2.0 – 5.5	1460nm ≥ 2
	1565nm	4.5 – 6.0	1530 to 1565 ≥ 5.5 ≤ 10
	1625nm	5.8 – 11.2	1565 to 1625 ≥ 7 ≤ 13.4
Macro-bend loss	1550nm	Ø32mm, 1turn, ≤ 0.5dB	Ø32mm, 1turn, ≤ 0.05dB
		Ø60mm, 100turns, ≤ 0.05dB	Ø50mm, 100turns, ≤ 0.05dB
	1625nm	Ø32mm, 1turn, ≤ 0.5dB	
		Ø60mm, 100turns, ≤ 0.05dB	Ø60mm, 100turns, ≤ 0.05dB