PT. SUMI INDO KABEL Tbk.

AFFILIATE OF

SUMITOMO ELECTRIC INDUSTRIES, LTD - JAPAN

Certificate No. ID04/0475

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Single-Mode Optical Fiber (G.652B)

The single-mode optical fiber meets international standards such as ITU-T G. 652 B

The fiber operates in both 1310 nm and 1550 nm wavelength region.

Product specification

Single-Mode Optical Fiber (G.652B)

Geometrical Characteristics	
Mode field diameter at 1310 nm	9.30 ± 0.50 µm
Core/cladding concentricity error	≤ 0.5 µm
Cladding diameter	125.0 ± 1.0 µm
Cladding non-circularity	≤ 1.0 %
Primary coating material	UV curable acrylate
diameter	250 ± 15 µm (Colored)
color	Blue, Orange, Green, Brown, Slate,White
	Red, Black, Yellow, Violet, Pink, Aqua
Fiber curl radius	≥ 4.0 m
Optical Characteristics	
Attenuation at 1310 nm	≤ 0.35 dB/km (after cabling)
at 1550 nm	≤ 0.22 dB/km (after cabling)
Point discontinuity at 1310 and at 1550 nm	≤ 0.10 dB
Cable cut-off wavelength (λcc)	≤ 1260 nm
Zero dispersion wavelength	1300 - 1324 nm
Zero dispersion slope	≤ 0.092 ps/nm²·km
Chromatic dispersion at 1550 nm	≤ 18.0 ps/nm·km
Polarization mode dispersion	≤ 0.2 ps/√km (uncabled fiber with free tension)
Mechanical Characteriastics	
Proof test level	1.2 % (120 kpsi, 0.86 Gpa)

Low Water Peak Single-Mode Optical Fiber (G.652D)

"PureBand™"

Low water peak single-mode optical fiber *"PureBand ™"*, meets international standards such as ITU-T G 652 D. Its low water peak characteristics and excellent stability performance against hydrogen provide broad-range operation bandwidth while maintaining fully compatibility with conventional single-mode fiber.

Product specification

Sigle-Mode Optical Fiber (G.652D)

"PureBand™"

Geometrical Characteristics	
Mode field diameter at 1310 nm	9.20 ± 0.40 µm
at 1550 nm	10.40 ± 0.50 µm
Core/cladding concentricity error	≤ 0.4 µm
Cladding diameter	125.0 ± 0.5 µm
Cladding non-circularity	≤ 0.5 %
Primary coating material	UV curable acrylate
diameter	250 ± 15 µm (Colored)
color	Blue, Orange, Green, Brown, Slate,White
	Red, Black, Yellow, Violet, Pink, Aqua
Fiber curl radius	≥ 4.0 m
Optical Characteristics	
Attenuation at 1310 nm	≤ 0.34 dB/km (after cabling)
at 1383 nm	≤ 0.32 dB/km* (after cabling)
at 1550 nm	≤ 0.22 dB/km (after cabling)
at 1625 nm	≤ 0.25 dB/km (after cabling)
NOTE *: Attenuation increase due to hydrogen aging at this wavelength will be 0.01 dB/km	
in accordance with IEC 60793-2-50 test procedure.	
Point discontinuity at 1310 and at 1550 nm	≤ 0.05 dB
Cable cut-off wavelength (λcc)	≤ 1260 nm
Zero dispersion wavelength	1300 - 1324 nm
Zero dispersion slope	≤ 0.090 ps/nm²·km
Chromatic dispersion at 1550 nm	≤ 18.0 ps/nm·km
at 1625 nm	≤ 22.0 ps/nm·km
Polarization mode dispersion	≤ 0.2 ps/√km (uncabled fiber with free tension)
Mechanical Characteriastics	
Proof test level	1.2 % (120 kpsi, 0.86 Gpa)

Non-Zero Dispersion Shifted Single-Mode Optical Fiber (G.655 C)

"PureMetro™"

Non-zero dispersion shifted single-mode optical fiber (*PureMetro*™), meets international standard such as ITU-T G. 655 C.

The fiber enables customers to construct high performance long haul network as well as metropolitan one.

Product specification

Non-Zero Dispersion Shifted Single-Mode Optical Fiber (G.655C)

"PureMetro™"

Geometrical Specification		
Mode field diameter at 1550 nm		8.3 ± 0.5 µm
Core/cladding concentricity error		≤ 0.4 µm
Cladding diameter		125.0 ± 1.0 µm
Cladding non-circularity		≤ 1.0 %
Primary coating material		UV curable acrylate
	diameter	250 ± 15 µm (Colored)
	color	Blue, Orange, Green, Brown, Slate
Fiber color		White, Red, Black, Yellow, Violet
		Pink, Aqua.
Fiber curl		≥ 4 m
Optical Specification		
Attenuation	at 1550 nm	≤ 0.22 dB/km (after cabling)
	at 1625 nm	≤ 0.25 dB/km (after cabling)
	at 1310 nm	≤ 0.40 dB/km (after cabling)
Point discontinuity at 1550 nm		≤ 0.10 dB
Cable cut-off wavelength (λcc)		≤ 1300 nm
Chromatic dispersion	in 1530 - 1565 nm	2.0 - 6.0 ps/nm·km
	in 1565 - 1625 nm	4.0 - 9.8 ps/nm·km
Dispersion slope at 1550 nm		≤ 0.061 ps/nm²·km
Polarization mode dispersion		≤ 0.2 ps/√km (fiber with free tension)
Mechanical Specification		
Fiber proof test level		1.2 % (120 kpsi, 0.86 Gpa)

50/125 Graded-Index Multimode Optical Fiber (G 651)

50/125 multimode optical fiber, meets international standards such as ITU-T G.651.

The multimode fiber supports 1 Gbps over 550 m at 850 nm with vertical cavity surface emitting lasers (VCSELs) as specified in Gigabit Ethernet standard IEEE 802.3z while maintaining full compatibility with both 850 nm and LED-bassed conventional applications such as Ethernet, Internet Protocol and ATM

Product specification

50/125 Graded-Index Multimode Optical Fiber (G 651)

Geimetrical Characteristics		
Core diameter		50 ± 3 µm
Cladding diameter		125 ± 2 µm
Core/cladding concentricity-error		≤ 3 µm
Cladding non-circularity		≤ 2 %
Numerical aperture (Theoretical NA)		0.20 ± 0.02 (0.21 ± 0.02)
Primary coating	- material	UV curable acrylate
	- diameter	250 ± 15 µm (Colored)
	- color	Blue, Orange, Green, Brown, Slate
		White, Red, Black, Yellow, Violet
		Pink, Aqua
Optical Characteristics		
Attenuation	at 850 nm	≤ 3.0 dB/km (after cabling)
	at 1300 nm	≤ 1.0 dB/km (after cabling)
Point discontinuity at 850 nm and at 1300 nm		≤ 0.2 dB/km
Overfielled launch bandwidth	at 850 nm	≥ 500 MHz·km
	at 1300 nm	≥ 500 MHz·km
Mechanical Characteristics		
Proof test level		1.0 % (100 kpsi)

62.5/125 Graded-Index Multimode Optical Fiber

62.5/125 multimode fiber is a graded-index multimode optical fiber with a 62.5 µm core diameter and a 125 µm cladding diameter.

The fiber has the highest bandwidth and lowest attenuation, which is statisfying with the use at both 850 nm and 1300 nm.

The optical fiber is comprehensively optimized for performance at at the 850 nm and 1300 nm operating wavelength.

Product specification

62.5/125 Graded-Index Multimode Optical Fiber

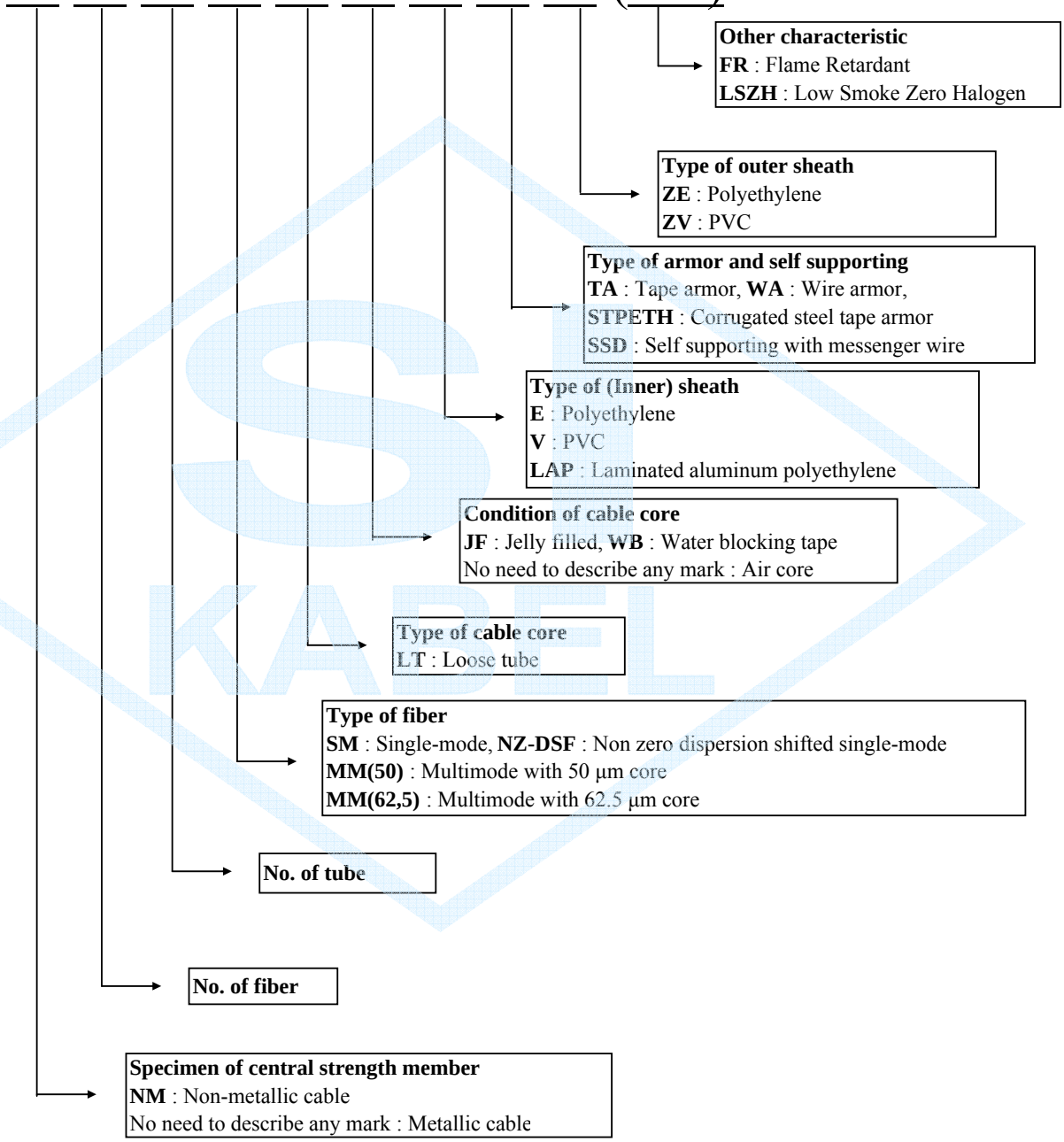
Geometrical characteristics		
Core diameter		62.5 ± 2.5 µm
Cladding diameter		125.0 ± 1.0 µm
Core/cladding concentricity error		≤ 1.5 µm
Cladding non-circularity		≤ 1.0 %
Numerical aperture (Theoretical NA)		0.275 ± 0.015
Primary coating	- material	UV curable acrylate
	- diameter	250 ± 15 µm (Colored)
	- color	Blue, Orange, Green, Brown, Slate
		White, Red, Black, Yellow, Violet
		Pink, Aqua
Optical characteristics		
Attenuation at	850 nm	≤ 3.5 dB/km
	1300 nm	≤ 1.5 dB/km
Overfilled Modal Bandwidth at	850 nm	≥ 200 MHz·km
	1300 nm	≥ 600 MHz·km
Mechanical characteristics		
Proof test level		1.0 % (100 kpsi)

Attachment A

Cable Abbreviation

NM/24/2T/SM/LT/JF/LAP/TA/ZE/(FR)

♦1/♦2/♦3/♦4/♦5/♦6/♦7/♦8/♦9/(♦10)



NOTE :

(1)/(2)/(3)/LT/JF/LAP ((3).B D LT)

Loose tube, jelly filled, laminated aluminium tape PE jacket

Duct Application

PT. TELKOM Specification No. STEL K-015

No. of fiber / No. of tube	Sheath Thicknesss (Nominal) mm (4)	Cable Diameter (Nominal) mm	Cable Weight (Approx) kg/km	Standard Length m	Remark
2/1T	2.2	14	165	2,000	4 fiber / tube 6 position
4/1T	2.2	14	165	2,000	
8/2T	2.2	14	165	2,000	
12/3T	2.2	14	165	2,000	
16/4T	2.2	14	165	2,000	
6/1T	2.2	14	165	2,000	6 fiber / tube 6 position
12/2T	2.2	14	165	2,000	
24/4T	2.2	14	165	2,000	
36/6T	2.2	14	165	2,000	
24/2T	2.2	15	190	2,000	12 fiber / tube 6 position
36/3T	2.2	15	190	2,000	
48/4T	2.2	15	190	2,000	
60/5T	2.2	15	190	2,000	
72/6T	2.2	15	190	2,000	
60/5T	2.2	17	230	2,000	12 fiber / tube 8 position
72/6T	2.2	17	230	2,000	
84/7T	2.2	17	230	2,000	
96/8T	2.2	17	230	2,000	

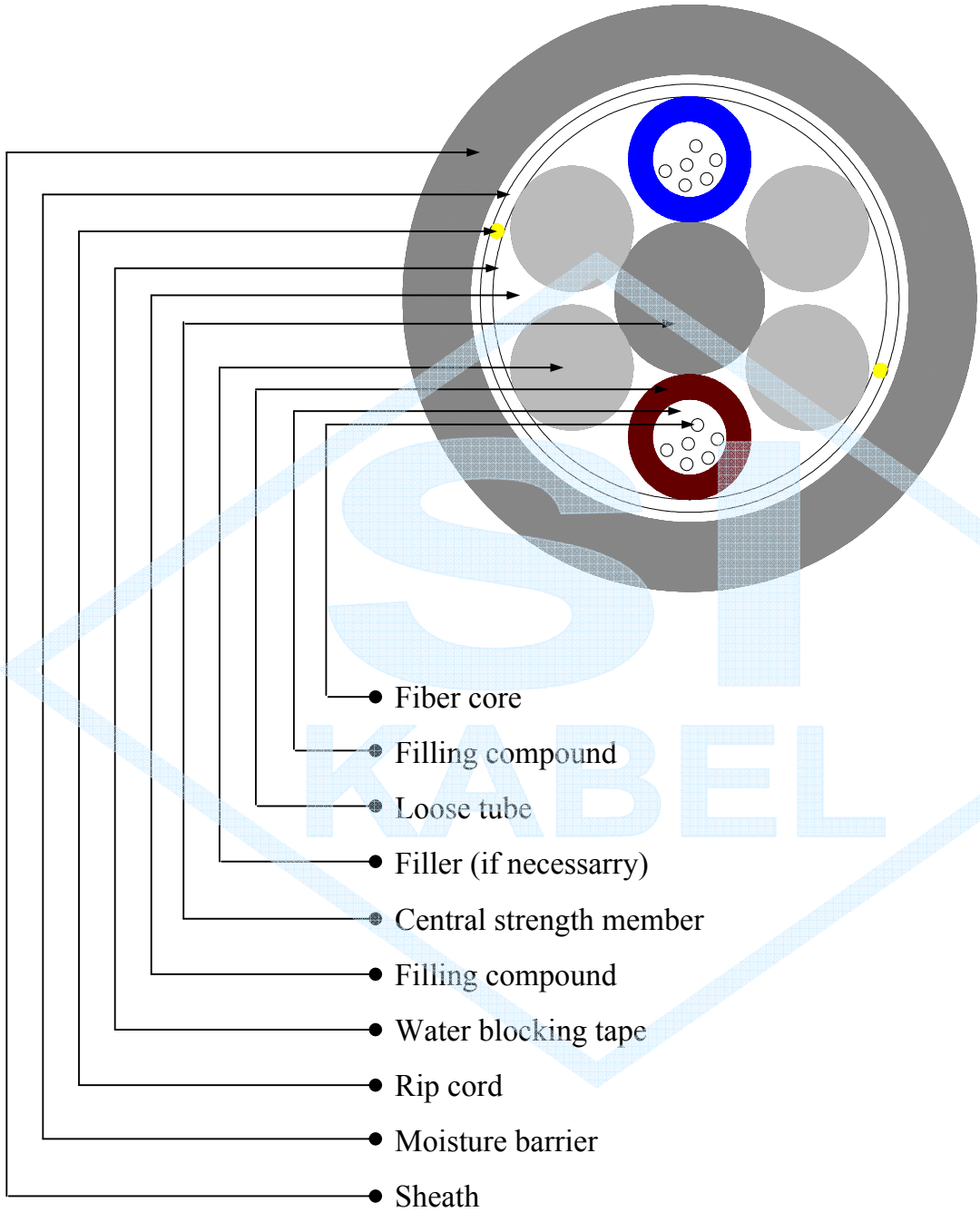
NOTE : (1) = Number of fiber

(2) = Number of tube

(3) = Fiber type (SM, MM, NZDSF)

(4) = Including LAP

Cross section of duct cable



(1)/(2)/(3)/LT/JF/LAP/STPETH ((3).B B LT)

Loose tube, jelly filled, LAP sheath, corrugated steel tape armor, PE jacket

Direct burried application

PT. TELKOM Specification No. STEL K-016

No. of fiber / No. of tube	Inner Sheath Thickness (Nominal) mm (4)	Cable Diameter (Nominal) mm	Cable Weight (Approx) kg/km	Standard Length m	Remark
2/1T	2.2	18	325	1,000	4 fiber / tube 6 position
4/1T	2.2	18	325	1,000	
8/2T	2.2	18	325	1,000	
12/3T	2.2	18	325	1,000	
16/4T	2.2	18	325	1,000	
6/1T	2.2	18	325	1,000	6 fiber / tube 6 position
12/2T	2.2	18	325	1,000	
24/4T	2.2	18	325	1,000	
36/6T	2.2	18	325	1,000	
24/2T	2.2	20	360	1,000	12 fiber / tube 6 position
36/3T	2.2	20	360	1,000	
48/4T	2.2	20	360	1,000	
60/5T	2.2	20	360	1,000	
72/6T	2.2	20	360	1,000	
60/5T	2.2	21	415	1,000	12 fiber / tube 8 position
72/6T	2.2	21	415	1,000	
84/7T	2.2	21	415	1,000	
96/8T	2.2	21	415	1,000	

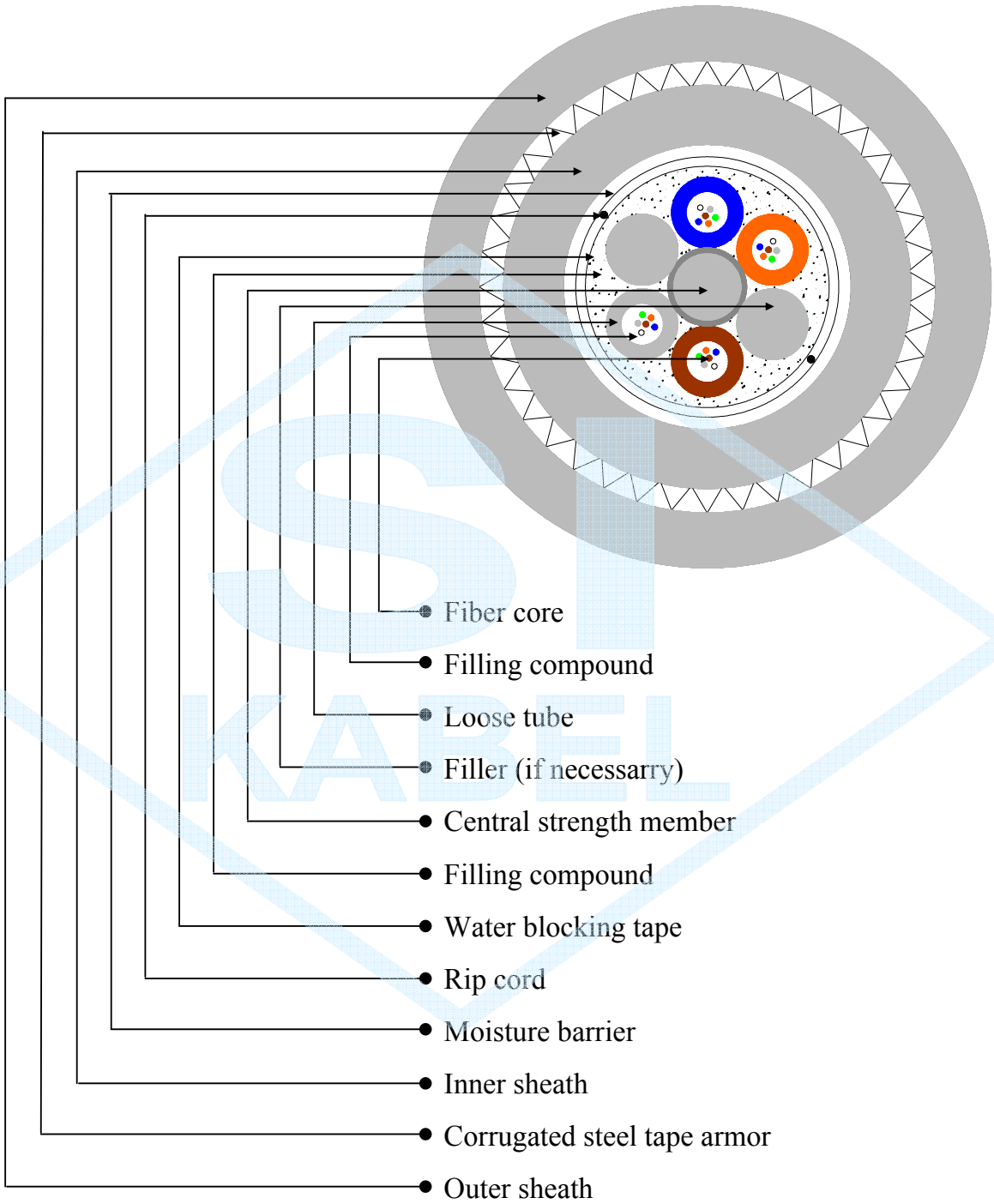
NOTE : (1) = Number of fiber

(2) = Number of tube

(3) = Fiber type (SM, MM, NZDSF)

(4) = Including LAP

Cross section of direct burried cable



(1)/(2)/(3)/LT/JF/LAP/SSD ((3).B A LT)

Loose tube, jelly filled, LAP Tape, PE sheath with messenger wire figure 8.

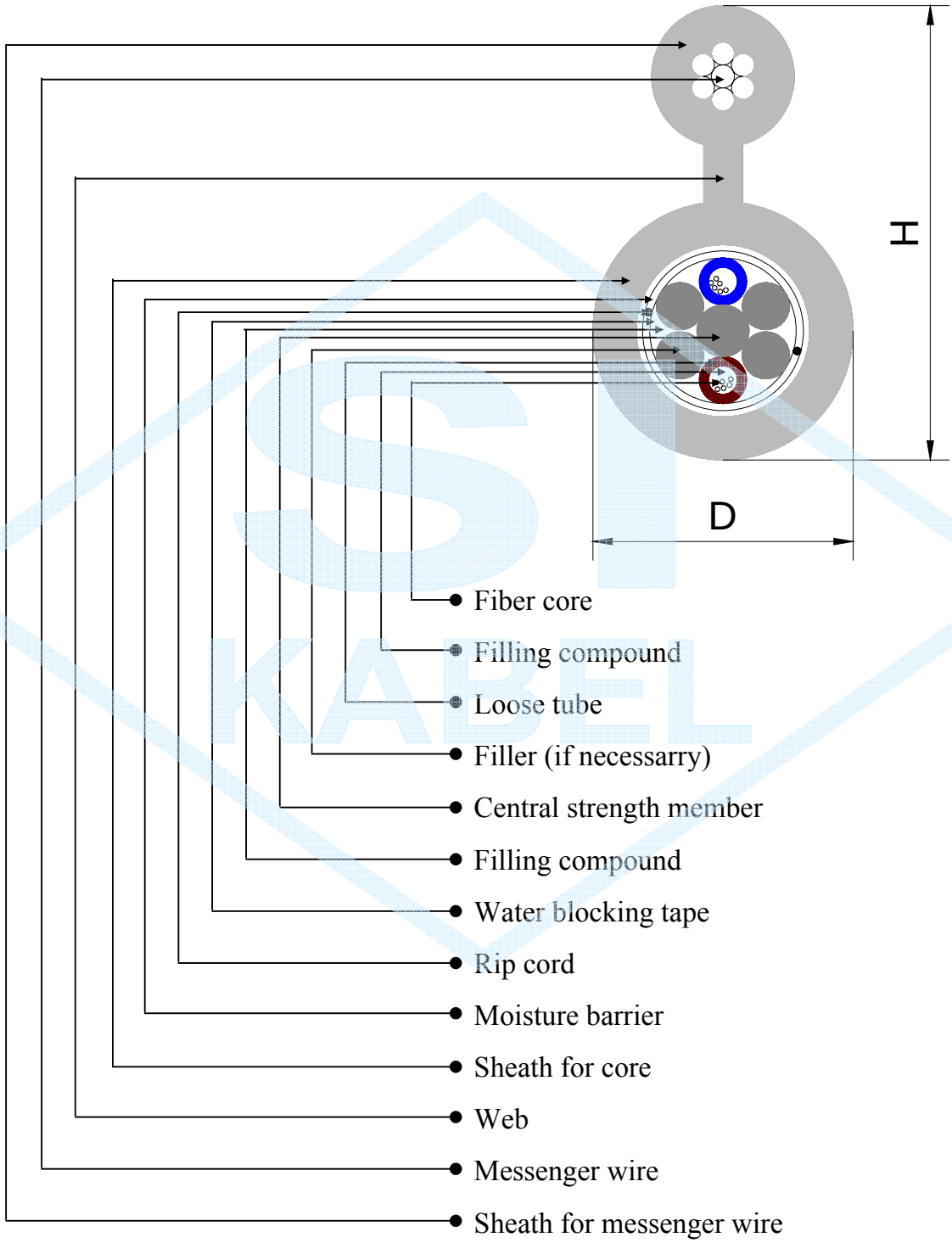
Aerial Application

PT. TELKOM Specification No. STEL K-017

No. of fiber / No. of tube	Sheath Thicknesss (Nominal) mm (4)	Cable Dimension mm D (5)	Cable Dimension mm H (6)	Cable Weight (Approx,) kg/km	Standard Length m	Remark
2/1T	2.2	14	25	250	2,000	4 fiber / tube 6 position
4/1T	2.2	14	25	250	2,000	
8/2T	2.2	14	25	250	2,000	
12/3T	2.2	14	25	250	2,000	
16/4T	2.2	14	25	250	2,000	
6/1T	2.2	14	25	250	2,000	6 fiber / tube 6 position
12/2T	2.2	14	25	250	2,000	
24/4T	2.2	14	25	250	2,000	
36/6T	2.2	14	25	250	2,000	
24/2T	2.2	15	26	275	2,000	12 fiber / tube 6 position
36/3T	2.2	15	26	275	2,000	
48/4T	2.2	15	26	275	2,000	
60/5T	2.2	15	26	275	2,000	
72/6T	2.2	15	26	275	2,000	
60/5T	2.2	17	28	330	2,000	12 fiber / tube 8 position
72/6T	2.2	17	28	330	2,000	
84/7T	2.2	17	28	330	2,000	
96/8T	2.2	17	28	330	2,000	

NOTE : (1) = Number of fiber
(2) = Number of tube
(3) = Fiber type (SM, MM, NZDSF)
(4) = Including LAP
(5) = Diameter of cable
(6) = Height of cable

Cross section of aerial cable

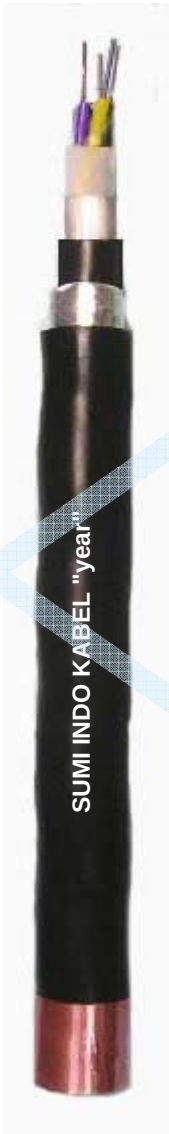


(1)/(2)/(3)/LT/JF/LAP/TAZE ((3).B B LT)

Loose tube, jelly filled, LAP sheath, Double steel tape armor, PE jacket

Direct burried application

PT TELKOM Specification No. STEL K-016

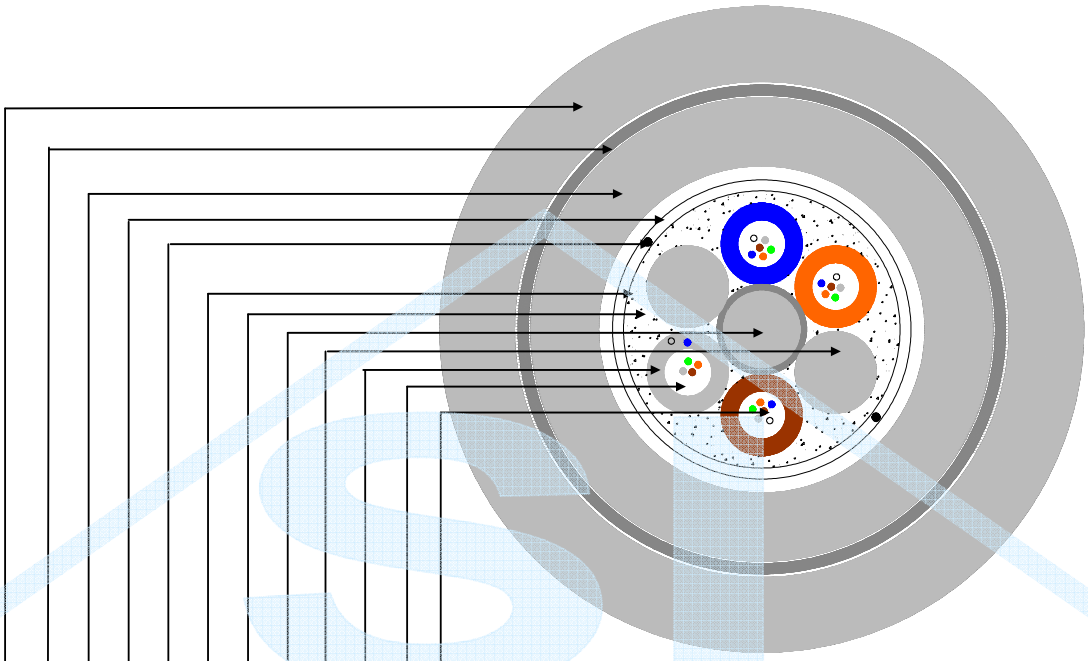


No. of fiber / No. of tube	Inner Sheath Thickness (Nominal) mm (4)	Cable Diameter (Nominal) mm	Cable Weight (Approx) kg/km	Standard Length m	Remark
2/1T	2.2	17	375	2,000	
4/1T	2.2	17	375	2,000	
8/2T	2.2	17	375	2,000	4 fiber / tube
12/3T	2.2	17	375	2,000	6 position
16/4T	2.2	17	375	2,000	
6/1T	2.2	17	375	2,000	
12/2T	2.2	17	375	2,000	6 fiber / tube
24/4T	2.2	17	375	2,000	6 position
36/6T	2.2	17	375	2,000	
24/2T	2.2	19	420	2,000	
36/3T	2.2	19	420	2,000	12 fiber / tube
48/4T	2.2	19	420	2,000	6 position
60/5T	2.2	19	420	2,000	
72/6T	2.2	19	420	2,000	
60/5T	2.2	20	490	2,000	
72/6T	2.2	20	490	2,000	12 fiber / tube
84/7T	2.2	20	490	2,000	8 position
96/8T	2.2	20	490	2,000	

NOTE : (1) = Number of fiber (3) = Fiber type (SM, MM, NZDSF)

(2) = Number of tube (4) = Including LAP

Cross section of direct burried cable



- Fiber core
- Filling compound
- Loose tube
- Filler (if necessarry)
- Central strength member
- Filling compound
- Water blocking tape
- Rip cord
- Moisture barrier
- Inner sheath
- Double steel tape armor
- Outer sheath

(1)/(2)/(3)/LT/JF/LAP/WAZE

Loose tube, jelly filled, LAP sheath, Galvanized steel wire armor, PE jacket

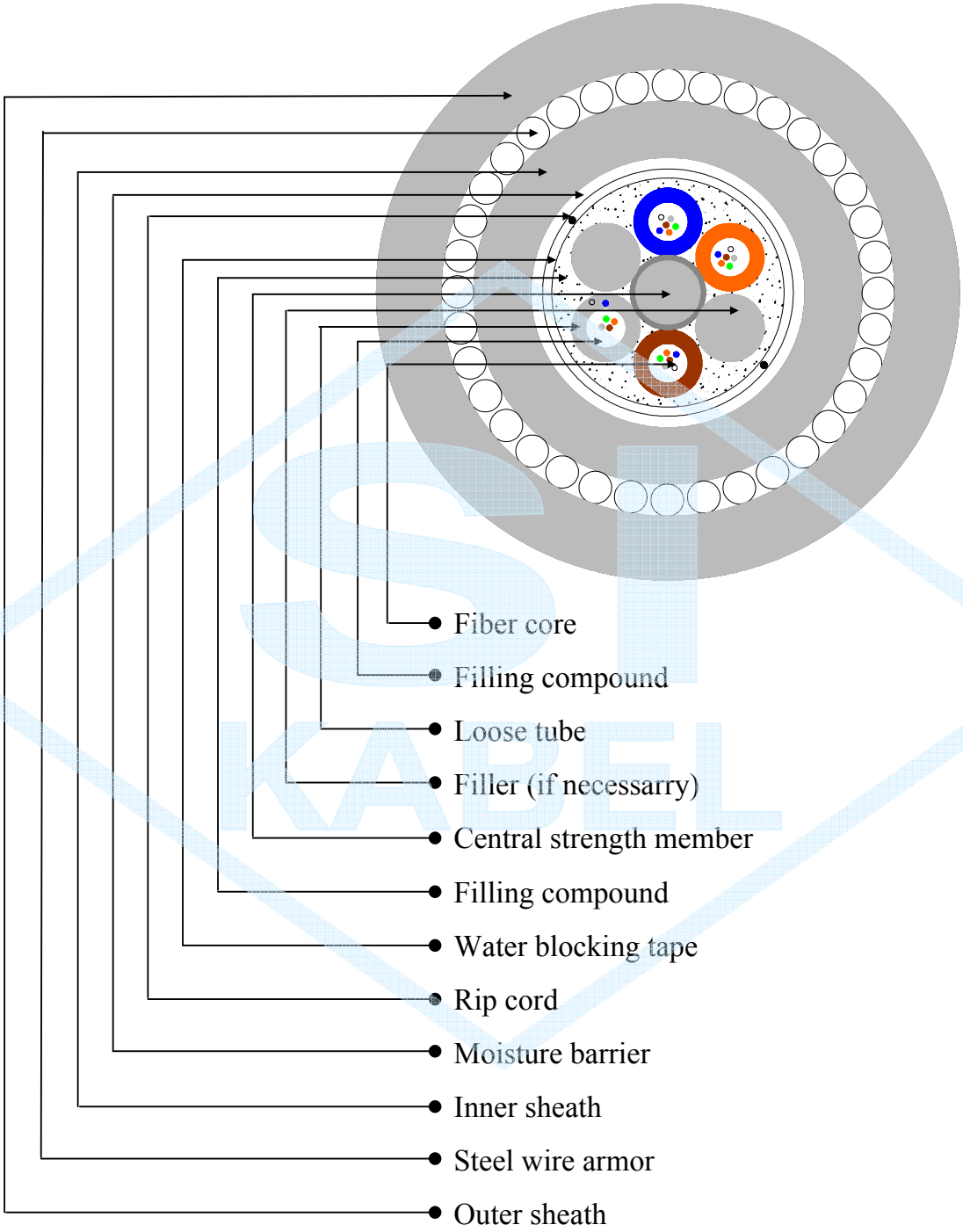
Direct burried application

No. of fiber / No. of tube	Inner Sheath Thicknesss (Nominal) mm (4)	Cable Diameter (Nominal) mm	Cable Weight (Approx) kg/km	Standard Length m	Remark
2/1T	1.25	18	455	2,000	4 fiber / tube 6 position
4/1T	1.25	18	455	2,000	
8/2T	1.25	18	455	2,000	
12/3T	1.25	18	455	2,000	
16/4T	1.25	18	455	2,000	
6/1T	1.25	18	455	2,000	6 fiber / tube 6 position
12/2T	1.25	18	455	2,000	
24/4T	1.25	18	455	2,000	
36/6T	1.25	18	455	2,000	
24/2T	1.25	20	505	2,000	12 fiber / tube 6 position
36/3T	1.25	20	505	2,000	
48/4T	1.25	20	505	2,000	
60/5T	1.25	20	505	2,000	
72/6T	1.25	20	505	2,000	
60/5T	1.25	21	585	2,000	12 fiber / tube 8 position
72/6T	1.25	21	585	2,000	
84/7T	1.25	21	585	2,000	
96/8T	1.25	21	585	2,000	

NOTE : (1) = Number of fiber (3) = Fiber type (SM, MM, NZDSF)

(2) = Number of tube (4) = Including LAP

Cross section of direct burried cable



NM/(1)/(2)/(3)/LT/JF/PE

Loose tube, jelly filled, PE jacket

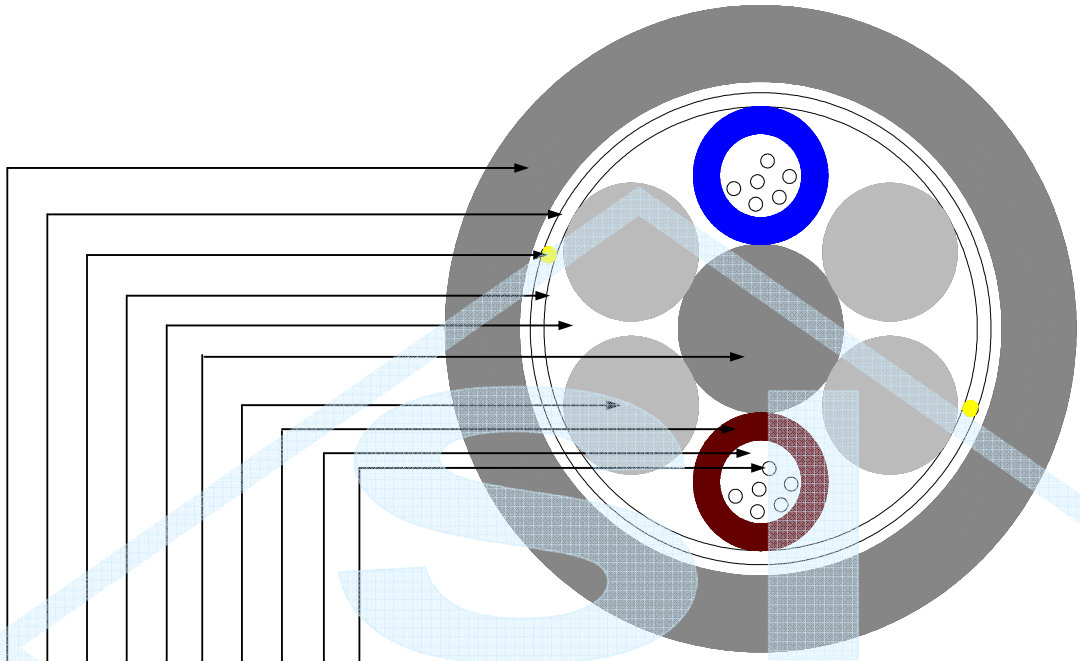
Duct application

No. of fiber / No. of tube	Sheath Thicknesss (Nominal) mm	Cable Diameter (Nominal) mm	Cable Weight (Approx) kg/km	Standard Length m	Remark
2/1T	2	12	110	2,000	4 fiber / tube 6 position
4/1T	2	12	110	2,000	
8/2T	2	12	110	2,000	
12/3T	2	12	110	2,000	
16/4T	2	12	110	2,000	
6/1T	2	12	110	2,000	6 fiber / tube 6 position
12/2T	2	12	110	2,000	
24/4T	2	12	110	2,000	
36/6T	2	12	110	2,000	
24/2T	2	14	140	2,000	12 fiber / tube 6 position
36/3T	2	14	140	2,000	
48/4T	2	14	140	2,000	
60/5T	2	14	140	2,000	
72/6T	2	14	140	2,000	
60/5T	2	15	180	2,000	12 fiber / tube 8 position
72/6T	2	15	180	2,000	
84/7T	2	15	180	2,000	
96/8T	2	15	180	2,000	

NOTE : (1) = Number of fiber (3) = Fiber type (SM, MM, NZDSF)

(2) = Number of tube

CROSS SECTION OF DUCT CABLE



- Fiber core
- Filling compound
- Loose tube
- Filler (if necessarry)
- Central strength member (Non-metallic)
- Filling compound
- Water blocking tape
- Rip cord
- Additional strength member
- Sheath