

The 13 Different Specifications of Single-mode Optical Fibre

The Christmas Lectures - CAS 2005

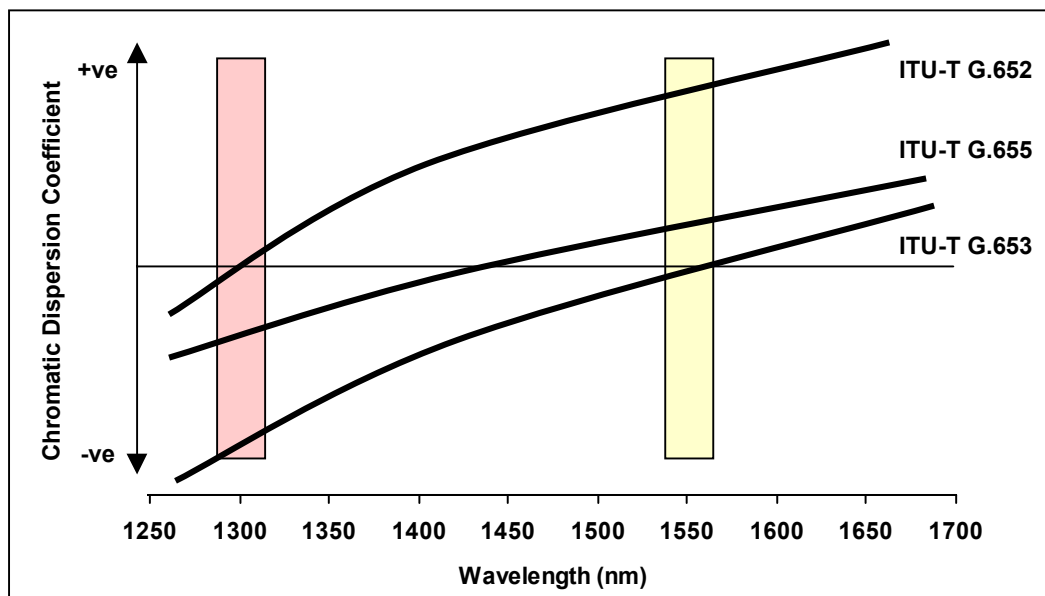
FIA 2006

FIA 2005
Commercial Awareness Seminars

**THE
13
DIFFERENT SPECIFICATIONS
OF
SINGLE-MODE OPTICAL FIBRE**

The 13 Different Specifications of Single-mode Optical Fibre

“Which singlemode would you like, Sir?”



- G.652 - Characteristics of a single-mode optical fibre cable
- G.653 - Characteristics of a dispersion-shifted single-mode optical fibre cable
- G.654 - Characteristics of a cut-off shifted single-mode optical fibre cable
- G.655 - Characteristics of a non-zero dispersion shifted single-mode optical fibre cable

IEC 60793-2-50

TYPE B1.1	equivalent to	G652a	G652b	
TYPE B1.2		G654a	G654b	G654c
TYPE B1.3		G652c	G652d	
TYPE B2		G653a	G653b	
TYPE B4		G655a	G655b	G655c
		G656		

The 13 Different Specifications of Single-mode Optical Fibre

IEC 60793-2-50 = BS EN 60793-2-50



BS EN 60793-2-50

Sectional specification for Class B single-mode fibres

Cladding diameter	125 +/- 1 µm	60793-1-20	IEC BS EN
Cladding non-circularity	<= 2,0 %	60793-1-20	IEC BS EN
Core concentricity error	<= 0,8 µm	60793-1-20	IEC BS EN
Primary coating diameter (uncoloured)	245 +/- 10 µm	60793-1-21	IEC BS EN
Primary coating diameter (coloured)	250 +/- 15 µm	60793-1-21	IEC BS EN
Coating-cladding concentricity error	<= 12,5 µm	60793-1-21	IEC BS EN
Strip force (Average)	1 - 5 average 1,0 - 8,9 peak	60793-1-32	IEC BS EN
Fibre curl radius	≥ 2 m	60793-1-34	IEC BS EN
Proof stress level	≥ 0,69 GPa	60793-1-30	IEC BS EN

1 % strain, 8.8 N

The 13 Different Specifications of Single-mode Optical Fibre

The Differences - Transmission Parameters



BS EN 60793-2-50

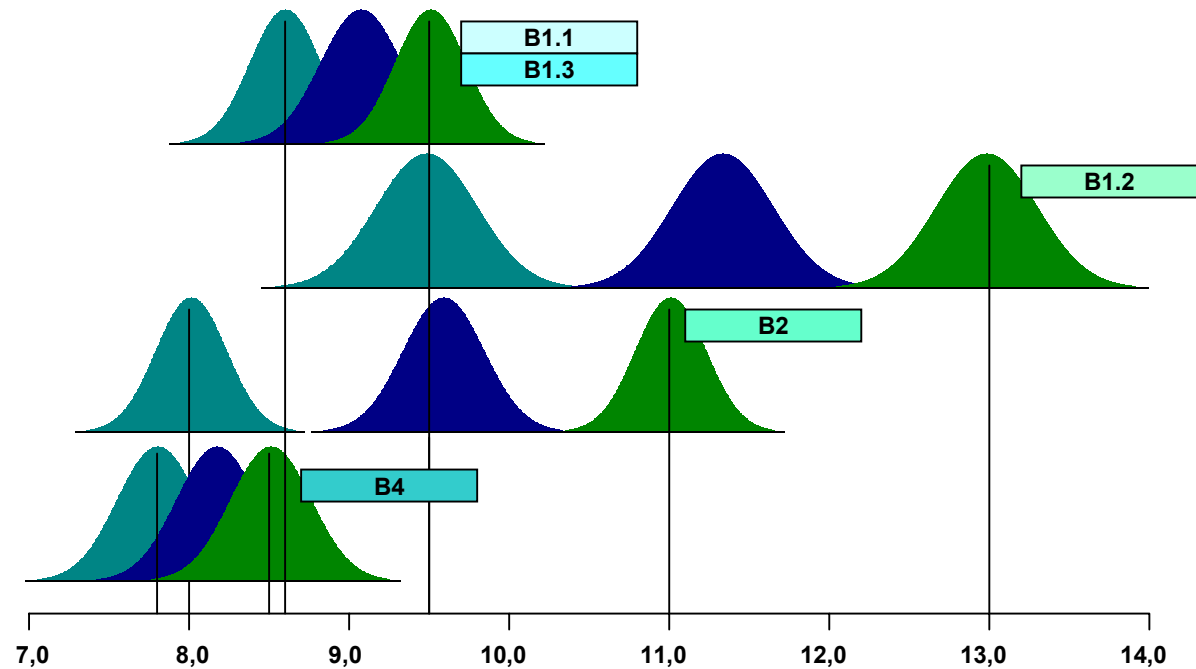
Sectional specification for Class B single-mode fibres

		Type B1.1	Type B1.2	Type B1.3	Type B2	Type B4		
Attenuation coefficient (dB/km max)	1310 nm	0,40			0,50		60793-1-40	IEC
	1383 nm			0,40	-			
	1550 nm	0,30	0,25		0,30	0,30		
	1625 nm	0,40	0,40		0,40	0,40		
Zero dispersion wavelength (nm)		1300-1324		1300-1324	1525-1575	1525-1575	60793-1-42	IEC
Zero dispersion slope (ps/nm ² .km)		≤ 0,093	≤ 0,07 @ 1550nm	≤ 0,093	≤ 0,085	≤ 0,085		
Dispersion coefficient (ps/nm.km)			≤ 22					
Dispersion coefficient λ = 1525-1575 nm					≤ 3			
Dispersion coefficient λ = 1525-1565 nm						+/- 1 - 10 (range 5)	60793-1-44	IEC
Dispersion coefficient λ = 1565 -1625 nm						ffs		
Cut-off wavelength (nm max.)		1260	1530	1260	1260	1480	60793-1-44	IEC
Macrobending loss (dB max.)		0,5	0,5	0,5	0,5	0,5	60793-1-47	IEC
								BS EN

The 13 Different Specifications of Single-mode Optical Fibre

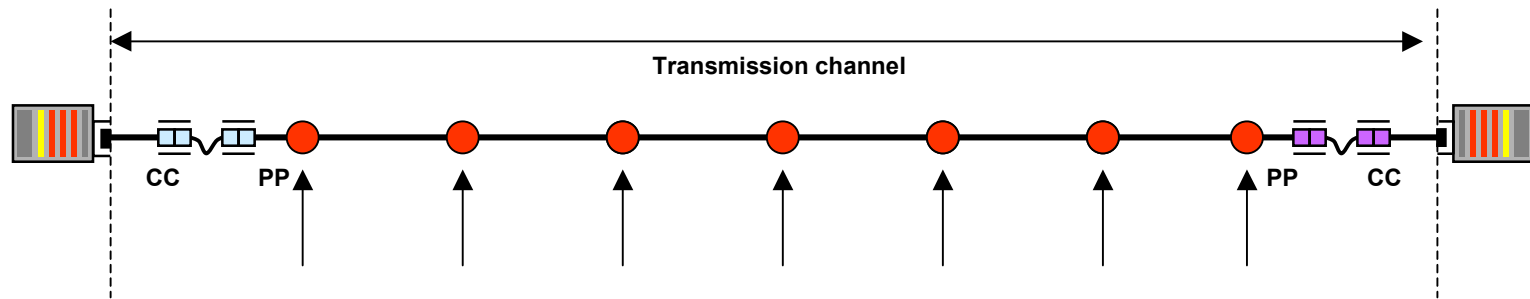
The Differences - Mode Field Diameter

MODE FIELD DIAMETER (μm)					
Limit +/- tolerance				Extreme limits	
	Wavelength	Minimum	Maximum	Minimum	Maximum
B1.1	1310nm	8,6 +/- 0,7	9,5 +/- 0,7	7,9	10,2
B1.3	1310nm	8,6 +/- 0,7	9,5 +/- 0,7	7,9	10,2
	Wavelength	Minimum	Maximum	Minimum	Maximum
B1.2	1550nm	9,5 +/- 1,0	13,0 +/- 1,0	8,5	14,0
B2	1550nm	7,8 +/- 0,8	8,5 +/- 0,8	7,0	9,3
B4	1550nm	8,0 +/- 0,7	11,0 +/- 0,7	7,3	11,7





The 13 Different Specifications of Single-mode Optical Fibre

The Channel



The 13 Different Specifications of Single-mode Optical Fibre

Challenges - Practical

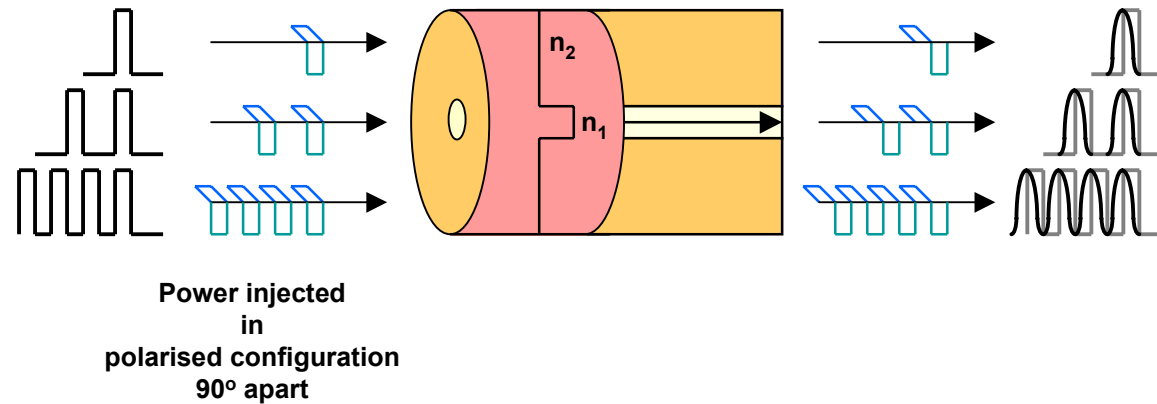
			
THE FIBROPTIC INDUSTRY ASSOCIATION		www.fibreoptic.org.uk	
INSTALLATION	2000-4-1-1	INSTALLATION PRACTICE: SPLICING	

	IEC TR 62000	Single-mode fire compatibility guidelines
---	--------------	---

FIA 2006

Challenges - Transmission

POLARISATION MODE DISPERSION



IEC TR 62000

Single-mode fibre compatibility guidelines