

# FIA

Technical Directorate

2010 NETCOMS 2010

## OM3, OM4, OS1 AND OS2: SPECIFICATION AND ADDED VALUE

Mike Gilmore  
**FIA** Technical Director



the Network  
Infrastructure  
Event 2010

[www.fia-online.co.uk](http://www.fia-online.co.uk)

## Mike Gilmore



**Mike Gilmore**  
Managing Director  
e-Ready Building

### Standards Activities



*Member*  
JTC1 SC25 WG3: Generic Cabling  
*Convenor*



JTC1 SC25 WG3 CITG: Cabling Implementation Task Group  
JTC1 SC25 WG3 IPTG: Industrial Premises (Cabling) Task Group



*Convenor*  
TC215 WG1: IT Cabling  
*Secretary*  
TC215 WG2



*Leader - Special Task Force 362*  
Energy Efficiency and Broadband Deployment



*Chairman*  
TCT7: Telecommunications - Installation Requirements  
TCT7/-1: Cabling infrastructure design, planning and commissioning  
TCT7/-3: Facilities and infrastructures  
*Meeting Secretary*  
TCT7/-2: Cabling installation and UK implementation



**FIA**  
[www.fia-online.co.uk](http://www.fia-online.co.uk)

*Technical and Standards Director*  
Fibreoptic Industry Association

**TIAB**  
[www.fia-online.co.uk/TIAB](http://www.fia-online.co.uk/TIAB)

*Director*  
Telecommunications Infrastructure Advisory Board

Mobile: +44 (0) 7860 110563

e-mail: [mike.gilmore@btinternet.com](mailto:mike.gilmore@btinternet.com)



the Network  
Infrastructure  
Event 2010

[www.fia-online.co.uk](http://www.fia-online.co.uk)

# OM - differentiated by bandwidth

		Multimode						
		Wavelength (nm)	50/125 or 62.5/125	50/125	50/125	50/125		
			OM1	OM2	OM3	OM4		
Attenuation (dB/km max)	850	3,5						
	1300	1,5						
Modal bandwidth requirements apply to the optical fibre used to produce the relevant cabled optical fibre category and are assured by the parameters and test methods specified in IEC 60793-2-10.								
Modal Bandwidth (MHz.km min)	Over-filled launch	850	200	500	1500	3500	Over-filled launch	
		1300	500	500	500	500		
	Effective	850	-	-	2000	4700	Application-specific <sup>1</sup>	
		1300	-	-	-	-		

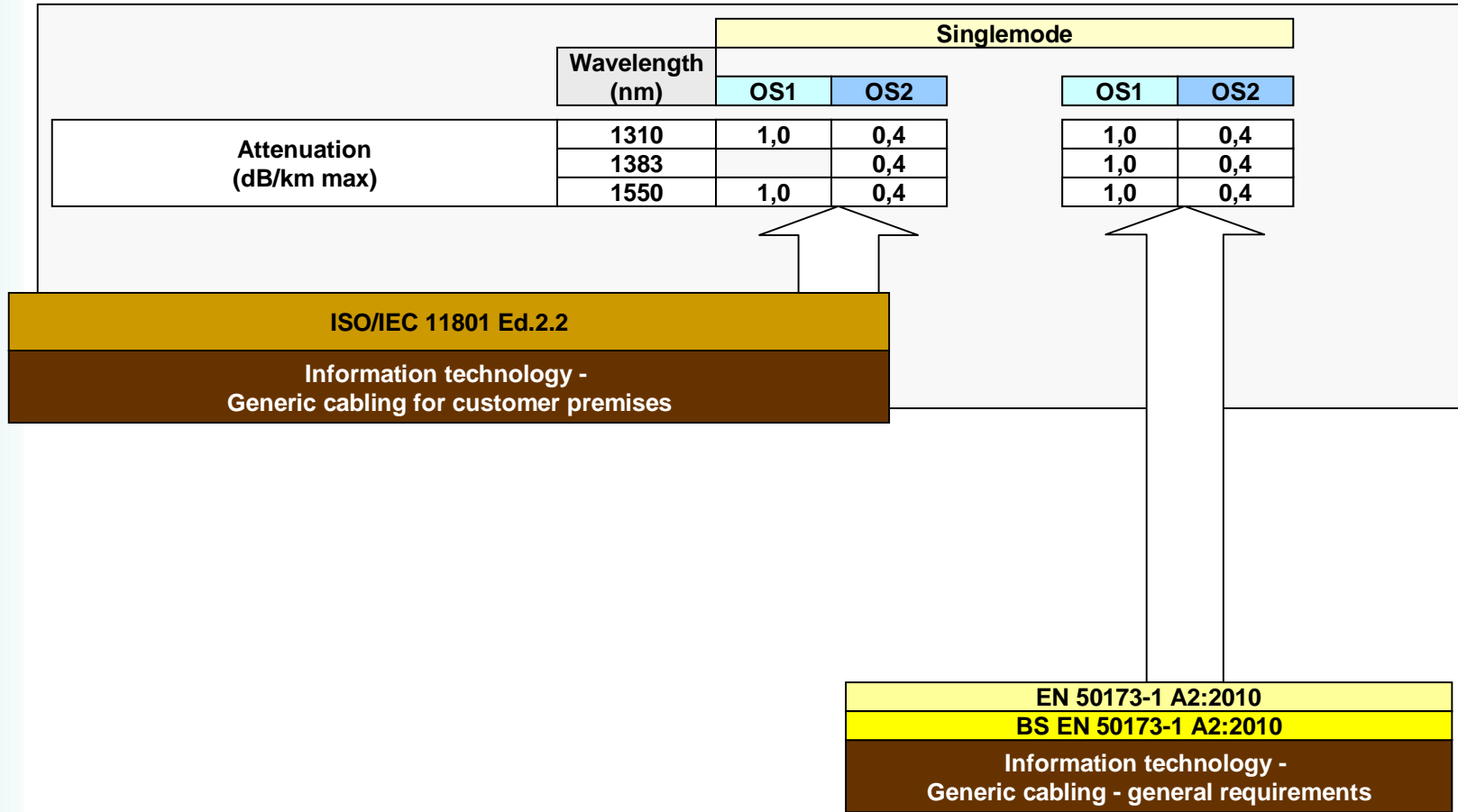
ISO/IEC 11801 Ed.2.2
Information technology - Generic cabling for customer premises

EN 50173-1 A2:2010
BS EN 50173-1 A2:2010
Information technology - Generic cabling - general requirements
<sup>1</sup> this bandwidth is based on application-specific implementation of the EMB <sub>C</sub> requirements of EN 60793-2-10.



# OS - differentiated by attenuation



# OM - the optical fibres differ

		Multimode					
		Wavelength (nm)	62.5/125 or 50/125	50/125	50/125		
		OM1	OM2	OM3	OM4		
Attenuation (dB/km max)	850	3,5					
	1300	1,5					
Modal bandwidth requirements apply to the optical fibre used to produce the relevant cabled optical fibre category and are assured by the parameters and test methods specified in IEC 60793-2-10.							
Modal Bandwidth (MHz.km min)	Over-filled launch	850	200	500	1500	3500	Over-filled launch
		1300	500	500	500	500	
	Effective	850	-	-	2000	4700	Application-specific <sup>1</sup>
		1300	-	-	-	-	

ISO/IEC 11801 Ed.2.2 EN 50173-1 A.2 BS EN 50173-1 A.2	Optical fibre	A1b or A1a.1	A1a.2	A1a.3
		IEC 60793-2-10: 2010		
		EN 60793-2-10: 2010		
		BS EN 60793-2-10: 2010		



# The World of Singlemode

Optical fibres - Product specifications

General

IEC 60793-2 EN 60793-2 BS EN 60793-2	-50	Sectional specification for category B singlemode fibres (Ed.3: 2008)				
		Annex A	Category B1.1	G.652a	G.652b	
		Annex B	Category B1.2	G.654b	G.654c	
		Annex C	Category B1.3	G.652c	G.652d	
		Annex D	Category B2	G.653a	G.653b	
		Annex E	Category B4	G.655c	G.655d	G.655e
		Annex F	Category B5	G.656		
		Annex G	Category B6_a	G.657 A1	G.657 A2	
Category B6_b	G.657 B2		G.657 B3			



# OS - the optical cables differ

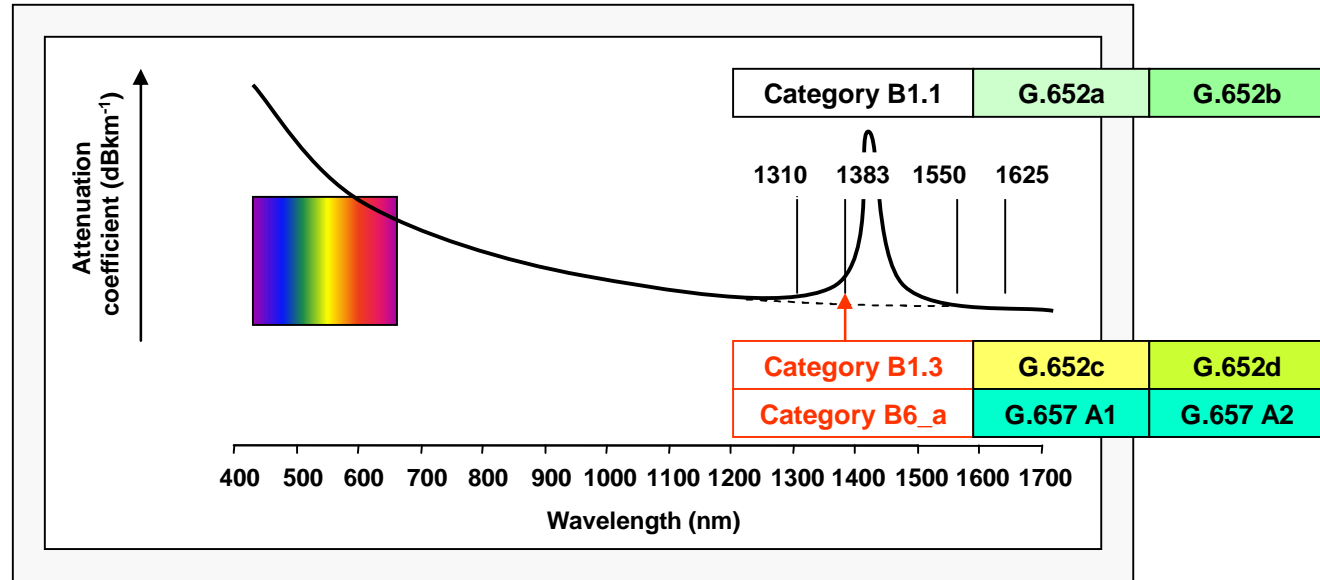
Optical fibres - Product specifications						
General						
IEC 60793-2 EN 60793-2 BS EN 60793-2	-50	Sectional specification for category B singlemode fibres (Ed.3: 2008)				
		Annex A	Category B1.1	G.652a	G.652b	
		Annex B	Category B1.2	G.654b	G.654c	
		Annex C	Category B1.3	G.652c	G.652d	
		Annex D	Category B2	G.653a	G.653b	
		Annex E	Category B4	G.655c	G.655d	G.655e
		Annex F	Category B5	G.656		
		Annex G	Category B6_a	G.657 A1	G.657 A2	
		Annex G	Category B6_b	G.657 B2	G.657 B3	

ISO/IEC 11801 Ed.2.2		
Information technology - Generic cabling for customer premises		
OS1		
OS2		
Category B1.1	Category B1.3	Category B6_a
B6_a optical fibre is recommended when it is expected that the optical fibre or the cable will have to support smaller bend radii than 25 mm.		

EN 50173-1 A2:2010		
BS EN 50173-1 A2:2010		
Information technology - Generic cabling - general requirements		
OS1		
OS2		
<del>Category B1.1</del>	Category B1.3	Category B6_a



# OS - the optical cables differ



Category B1.1	Optical fibre performance specified 1310 nm, 1550 nm and 1625 nm
Category B1.3	Optical fibre performance specified 1310 nm - 1625 nm
Category B6_a	
OS1 OS2	Optical fibre cable specified 1310 nm, 1383 nm and 1550 nm



## OS - B6\_a

### Optical fibres - Product specifications

#### General

IEC 60793-2 EN 60793-2 BS EN 60793-2	-50	Sectional specification for category B singlemode fibres (Ed.3: 2008)			
		Annex G	Category B6_a	G.657 A1	G.657 A2
			Category B6_b	G.657 B2	G.657 B3

No automatic compatibility with G.652

#### Less bend sensitive optical fibres

		G.657 A1			G.657 A2			G.657 B2			G.657 B3		
Radius (mm)		15	10		15	10	7,5	15	10	7,5	15	10	7,5
Turns		10	1		10	1	1	10	1	1	10	1	1
Δ att	1550 nm	0,25	0,75		0,03	0,1	0,5	0,03	0,1	0,5	0,03	0,08	0,15
	1625 nm	1,0	1,5		0,1	0,2	1,0	0,1	0,2	1,0	0,1	0,25	0,45

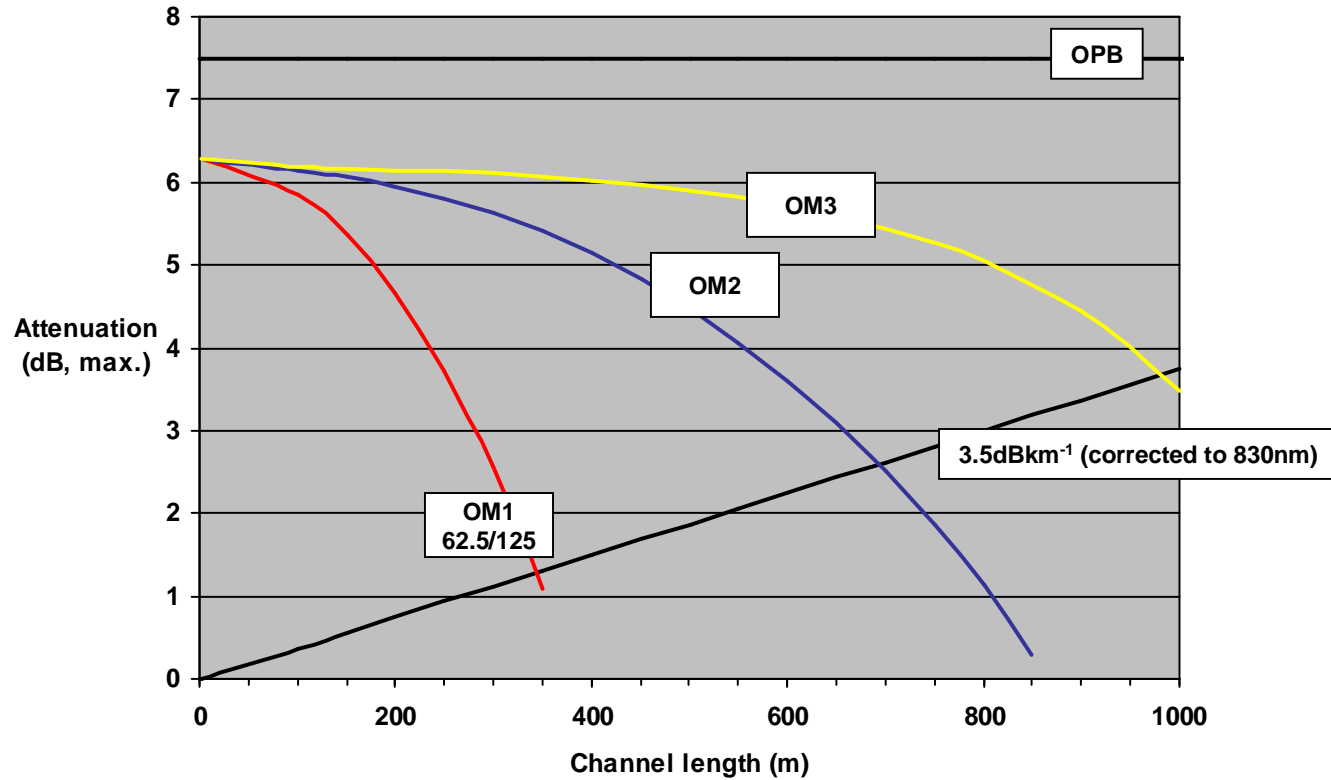
## OM Added Value

ADDED VALUE - 1			
Nominal Wavelength (nm)	850		
	62.5/125	50/125	
	OM1	OM2	OM3 OM4
<b>1000BASE</b>	<b>-SX</b>		
Application Wavelength (nm)	830nm		
OPB (dB, max.)	7.5		
Channel length (m, max.)	275	>550	
Channel loss (dB, max.)	2.60	3.56	
<b>10GBASE</b>	<b>-SR/SW</b>		
Application Wavelength (nm)	830nm		
OPB (dB, max.)	7.5		
Channel length (m, max.)	33	82	300
Channel loss (dB, max.)	1.62	1.80	2.59
Nominal Wavelength (nm)	850nm		
<b>40G/100BASE</b>	<b>-SR4/SR10</b>		
Application Wavelength (nm)	850nm		
OPB (dB, max.)	8.3		
Channel length (m, max.)		100	150
Channel loss (dB, max.)		1.90	1.53

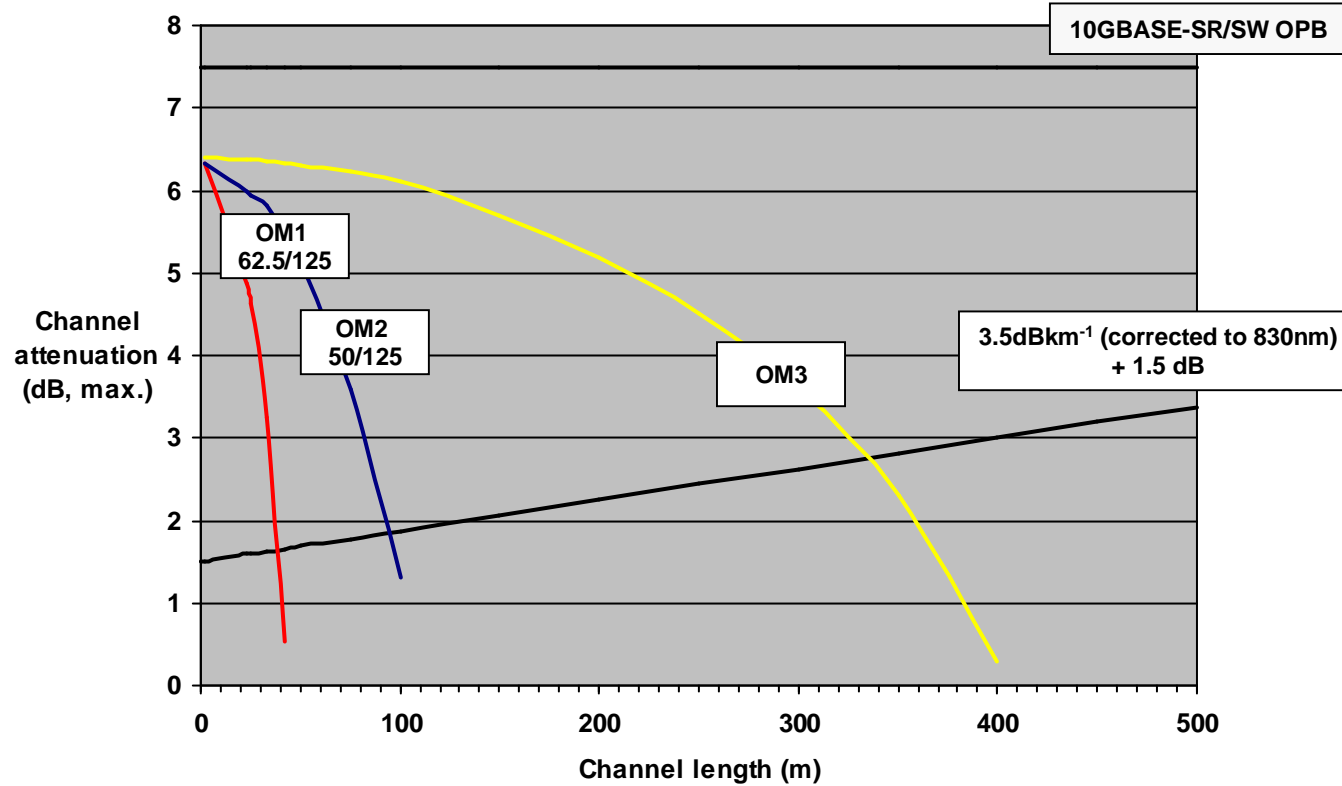
ADDED VALUE - 2	
INCREASED CHANNEL INSERTION LOSS AT A GIVEN LENGTH	
INCREASED CONNECTIVITY WITHIN CHANNELS	



## 1000BASE-SX



## 10GBASE-SR



# OS - Mix and Match Warnings



<b>ISO/IEC 11801 Ed.2.2</b>
<b>Information technology - Generic cabling for customer premises</b>
B1.1 optical fibre is not recommended where channels may contain both category OS1 and OS2 cabled optical fibre.
If concatenating different OSx cabled optical fibres manufactured with different optical fibre types, refer to IEC/TR 62000:2010 for additional guidance.

<b>EN 50173-1 A2:2010</b>
<b>BS EN 50173-1 A2:2010</b>
<b>Information technology - Generic cabling - general requirements</b>
The values for total connecting hardware attenuation in channels are based on the assumption that the optical fibres in the channel are of the same type (i.e. B1.3 or B6_a).





