



The Fibreoptic Industry Association

www.fia-online.co.uk

Secretary: Jane Morrison

The Manor House
BUNTINGFORD
Hertfordshire SG9 9AB
United Kingdom

Tel: +44 (0) 1763 273039 Fax: +44 (0) 1763 273255

e-mail: jane@fiasec.demon.co.uk

NEW CABLED OPTICAL FIBRE CATEGORIES - PART I

by

Mike Gilmore, Technical Director of the FIA

for Networking+ (March 2008)

At their February meeting in Barcelona, ISO/IEC JTC1 SC25 WG3 proposed the establishment of two new optical fibre types or Categories - one multimode and one singlemode. In terms of standardisation, it is unlikely that changes to the list of "OM"s and "OS"s will take place before 2009. However, it is likely that marketing literature will contain the new designations quite soon and it may be useful to provide advance information for specifiers and installers alike.

The multimode variant, currently termed OM4, will provide twice the laser/VCSEL bandwidth of OM3 and is targeted to provide greater useable distance and/or lower system implementation costs for the next generation 40 Gb/s and 100 Gb/s Ethernet solutions that are currently in development. The FIA article in next months Networking+ will cover this in detail.

The new "OS", which currently has no designation, provides performance levels somewhere between those of OS1 and OS2 - and is explained below.

Table with 2 columns: Title and Content. Row 1: Published cable standards containing OM1, OM2, OM3 and OS1 products. Row 2: Optical Fibre Cables : Indoor cables. Row 3: IEC 60794-2-11:2005 (and BS EN 60794-2-11:2005) Detailed specification for simplex and duplex cables for use in premises cabling. Row 4: IEC 60794-2-21:2006 (and BS EN 60794-2-21:2006) Detailed specification for multi-fibre optical distribution cables for use in premises cabling. Row 5: IEC 60794-2-31:2006 (and BS EN 60794-2-31:2006) Detailed specification for optical fibre ribbon cables for use in premises cabling. Row 6: Optical Fibre Cables : Outdoor cables. Row 7: IEC 60794-3-12:2006 (and BS EN 60794-3-12:2006) Detailed specification for duct and directly buried optical telecommunication cables for use in premises cabling. Row 8: IEC 60794-3-21:2006 (and BS EN 60794-3-21:2006) Detailed specification for optical self-supporting aerial telecommunication cables for use in premises cabling.

Table with 2 columns: Title and Content. Row 1: New editions, currently under development, also containing OS2 products. Row 2: Optical Fibre Cables : Outdoor cables. Row 3: IEC 60794-3-12 Detailed specification for duct and directly buried optical telecommunication cables for use in premises cabling. Row 4: IEC 60794-3-21 Detailed specification for optical self-supporting aerial telecommunication cables for use in premises cabling.

The discussions in Barcelona highlighted a number of issues regarding the meaning of the OM and OS terminology. One of most confused areas surrounding the development of new OF types or Categories related to their "meaning". Even though they call the OM/OS scheme "OF types", the international generic cabling standards make it clear that the designations OM1, OM2, OM3, OS1 and OS2 relate to cable transmission performance. The BS EN 50173 series makes it even clearer by describing the OM/OS scheme as "optical fibre cable Categories".

Both the IEC and EN committees have strengthened this relationship in the production of their cable standards as shown in the inset. It can be seen that OS2 is included only in the new 60794-3 "outdoor" series standards. This is because OS2 was born in the industrial premises standard, ISO/IEC 24702, to support 5 km and 10 km channels - which are by definition "outdoor". More importantly, the low attenuation values of OS2 are only realistic in loose-tube cables in which the original optical fibre performance is almost unaltered by the cabling process (the same could be said of "blown fibre").

The new singlemode variant reflects the need for an improved “indoor” singlemode optical fibre cable that is compatible with the OS2 product. Why is this needed?

Firstly, OS1 defines a very old specification - the original performance values came from ISO/IEC 11801:1995 and required the use of an optical fibre compliant with ITU-T G.652a or G.652b (IEC 60793-2-50 Type B1.1). The designation OS1 was introduced in 2002 but the performance requirements did not change - but OS1 allowed the use of singlemode optical fibre types meeting G.652c or G.652d (IEC 60793-2-50 Type B1.3). Secondly, by comparison, OS2 introduced in 2006, requires the optical fibre to be compliant with ITU-T G.652c or G.652d only.

ITU-T G652c/d optical fibres are “low water-peak”, suitable for coarse wavelength division multiplexed operation, and specified for transmission at 1310, 1383 and 1550 nm. ITU-T G652a/b optical fibres are not specified at 1383 nm.

As a result, the performance of OS1 cables is not automatically compatible with OS2 cables - the jointing of an OS1 indoor cable to an OS2 outdoor cable would result in an unspecified performance of the whole channel at 1383 nm. Therefore a new specification is required for “indoor” cables that use ITU-T G.652c/d optical fibres. As indoor cables tend to be of a buffered, tight construction, the attenuation performance of OS2 is unlikely to be maintained - hence the new OS designation. It is repeating that the new designation not agreed - it may be that the new designation replaces OS1 and therefore becomes OS1:2009 for example.

Further information is available via the FIA web-site at www.fia-online.co.uk Enquiries can be e-mailed to jane@fiasec.demon.co.uk.or, alternatively, you can contact the FIA Secretariat in 01763 273039.