



The Fibreoptic Industry Association

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AN INTRODUCTION TO OM4

by
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At their meeting in Los Cabos, Mexico of ISO/IEC JTC1 SC25 WG3 (23rd-27th March 2009) it was confirmed that the terms OM1, OM2 etc. applied to cabled optical fibre and also that they would be termed "Category". This latter aspect matches the terminology of EN 50173 standards since 2002. However, the application of the term Category to cabled optical fibres (rather than the optical fibres themselves - or to cables, which could contain optical fibres of different specifications) has led to amendments being required to all the generic cabling standards in the international and European areas. The change has even filtered down to current TIA activity in North America.

This White Paper is based on the information on OM4 in a White Paper produced in February 2008 but has been updated to take account of the above confirmation and associated changes.

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At their meeting in Barcelona (18th - 22nd February 2008), ISO/IEC JTC1 SC25 WG3 proposed the establishment of a new cabled optical fibre Category - designated OM4 using 50/125 µm optical fibre - which provides more than twice the laser/VCSEL bandwidth than 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.

Table with 7 columns: Cabled optical fibre Category, Optical fibre of IEC 60793-2-10, Maximum attenuation (dB/km), and Minimum modal bandwidth (MHzxkm) with sub-columns for Overfilled launch and Laser launch.

The case for a new OM Category is more to do with state-of-the-art a la "Category 6A" etc. than application demand. It is recognised that while OM3, introduced in 2002, represented a significant development in terms of bandwidth of multimode optical fibre, the performance levels attained today are significantly in excess of that milestone. Manufacturers have long since been describing their products as OM3+, or enhanced OM3 or equivalent and of course there is no basis for comparison for their individual claims. That in itself does not always justify a new "Category" - although it seems to be enough in the balanced cabling arena. It is more important to offer that performance uplift to an application that can then demonstrate its benefits. This is what happened for OM3 when IEEE used it as their 300 metre mapping of 10GBASE-SR. A further improved bandwidth performance designation "OM4" has been offered to both IEEE and Fibre Channel.

We all know that increased bandwidth should offer greater distances of support for current networks - but that is not always of interest to the applications committees who rarely if ever re-visit already published standards (for example we have no standards-based support for 1000BASE-SX over OM3).

The main hope is that the new performance specification may be of interest of new applications, currently in development, such as 40 Gb/s and 100 Gb/s Ethernet. The benefits were hoped to be that the distance of support may be increased or that the number of parallel optical fibres required (currently at least four and ten in each direction for 40 Gb/s and 100 Gb/s Ethernet respectively) may be reduced. The first of these hopes has been recognised by IEEE who amended their channel lengths objectives from 100 m over Category OM3 to include an option for 125 m over Category OM4. It is also likely that high bit rate networks such as FibreChannel,

which are still committed to duplex communication up to many tens of Gigabits, will find transmission distance benefits using OM4 cabled optical fibre in their future plans.

History has proved that once a new “Category” of anything is discussed, even at an elementary level, it will become reality. The current performance proposals for Category OM4 cabled optical fibre are shown in the table above (along with all the other OM specifications) and both the EN 50173-1:2007 Amendment 2 and ISO/IEC 11801:2002 Amendment 2 - both of which are close to completion – are expected to contain these values.

It should be noted that a separate activity continues to specify the optical fibre that is used to produce Category OM4 once it is cabled. It will be specified as optical fibre A1a.3 in a future IEC 60793-2-10 as detailed in the Table above.

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