



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

FIA TECHNICAL SUPPORT DOCUMENTS

by

Mike Gilmore, Technical Director

Two of the main aims of the FIA are to:

- promote and adopt standards to which professional participants within the fibre optic industry should be expected to adhere;
- provide a central source for information on wide ranging aspects of the fibre optic industry.

In support of these aims, the FIA has produced, and continues to develop, a range of Technical Support Documents that have an important role in explaining and interpreting existing standards-based requirements or making recommendations in areas in which national standards have not yet been produced or ratified.

In some cases, the FIA works to produce documents in collaboration with other industry bodies such as the ECA and TIA (UK) and, in special cases, sponsors work within national standards agencies.

An example of the latter is the publication of the **BSI BIP (Business Information Publication) 0007** which assists installers to determine their **obligations under BS 6701:2004 and the BS EN 50174 series** of standards covering installation of all types of telecommunication cabling and equipment. This was a unique activity - initiated and sponsored by the FIA - and which produced a document with the FIA hold joint copyright with BSI. This has allowed FIA members to download the document, free-of-charge, as many times as they wish to allow the document to be sent to consultants and clients who are also reminded of their obligations within the BS 6701:2004 regime.

Working in safety is a key focus of FIA Technical Support Documents. The **TSD-2000-5 series** of documents cover **optical power safety, handling of processing chemicals and disposal of optical fibre waste**. These are examples of documents that have been produced in response to the volume of enquiries to the FIA Secretariat. BS EN 60825-2 is the recognized safety standard for optical fibre communications systems and places demands on the users of such systems as well as the installers of the cabling that the systems operate over. The FIA TSD's provide clarification of these requirements and explain the methods by which conformance to the standards is demonstrated.

In some cases, technology moves faster than national standards and a good examples of this are test equipment and test methods. In recent years, LSPM test equipment has evolved - to some extent on the back of test equipment for balanced cabling - to such an extent that the established test methods, which have been harmonised on a world-wide basis, cannot be used. **TSD-2000-4-2-1** was written firstly to remind installers of the existing standards, outlining which test method to use to measure the **attenuation of specific configurations of installed cabling** using the older type of **LSPM equipment**. Furthermore the document defines alternative methods capable of measuring any cabling configuration with the more advanced kit now available. This document is now being used by international groups during the revision of their test method standards.

TSD-2000-4-2-1 is an example of how work undertaken by the FIA, moving quickly, can influence the standards bodies. Another example is **TSD-2000-3-3** that defines the FIA standard approach to the **maintenance of polarity in installed cabling**. This document covers simplex, duplex and array connecting hardware and was written in response to enquiries from our members. However, its clear treatment of a complex topic has led to requests for submission of the document as part of a forthcoming European standard on the subject.

In rare circumstances, a single FIA member can highlight a topic of such importance that the production of a Technical Support Document is allocated to a project team which brings in resources from outside the FIA. This was certainly the case for **TSD-2000-4-1-1** that contains recommendations for the **specification of splice loss**. Although including multimode technology the document is targeted at those involved with medium- and long-haul singlemode installations.

The jointing of optical fibres using fusion splicing techniques is a long established approach to the provision of high performance, environmentally stable connections between optical fibres. Over the years, the capability of fusion splicing equipment has improved substantially as has the control over the tolerances of optical fibres at each side of the joint. This has led to a steady reduction in achievable splice loss. However, there is a point at which significant improvements in splice loss performance can no longer be made without direct influence over the optical fibres themselves and it is generally recognised that such a point was reached a number of years ago. The impact of specifying overly ambitious, or incorrectly defined splice loss requirements concerns both the client and the installer alike. The installer may be faced with a considerable degree of rework that can have dramatic commercial consequences. The client may be faced with considerable project delays - the resolution of which will add further costs to the project.

TSD2000-4-1-1 has had a useful by-product. It was discovered that the ITU specifies no less than thirteen different single mode optical fibre types - between which fusion splicing will result in modified performance as compared with splicing between singlemode optical fibres of the same type. The majority of FIA members were unaware of this range of product specifications and a simple FIA White Paper is now available covering the background to this subject.

The performance testing of splice joints requires the use of an optical time domain reflectometer. Such equipment can also be used to assess other components in an installation and can, under certain circumstances, produce measurements of installed cabling attenuation which are directly comparable with those of LSPM equipment. **TSD-2000-4-2-2** defines methods of **OTDR analysis of installed cabling** and components and is written as a sister publication to TSD2000-4-2-1.

The specification and guidance for the selection of cabling components is also covered by FIA Technical Support Documents. **TSD-2000-2-1** covers the **selection of optical fibre cables** for specific environment and applications. The document provides reference to existing recognized standards. However, there are types of components for which no useful standards exist and one area in which this is particularly relevant is that of cords.

TSD-2000-2-3 defines requirements for FIA-compliant cords - be they **patch cords, equipment cords, test cords, mode conditioning cords or simple pigtails**. How cords are tested, identified, labelled, used and maintained can have a significant effect on network reliability - as users of high bit rate multimode networks are beginning to find out.

TSD-2000-4-5, providing a **template for a user guide for optical fibre cabling** is a direct response to the requirements BS 6701:2004. It links design objectives, component usage, operational safety such that users have clear instructions for their operation, repair and maintenance of their installations.

Last but not least, we come to **TSD-2000-1-1**, the **FIA LAN Application Support Guide**. Following the withdrawal of BS 7718 in 2003, design guidance in national standards has disappeared. For local area network (LAN) telecommunications the data rates have increased dramatically and are still doing so. As part of that process we have moved from loss-limited, or attenuation-limited, applications such as Token Ring and FDDI to bandwidth-limited applications such as 100BASE-SX/LX and 10 Gigabit Ethernet. This evolution has brought with it new design rules and enhanced performance options for multimode optical fibre cabling together with an increased emphasis on singlemode technology. The object of the FIA LAN Application Support Guide is to provide the reader with an understanding of both the "old" and "new" design issues.

All the FIA Technical Support Documents are free-of-charge to members, downloadable from the FIA web-site at www.FIA-online.co.uk. Members will need their password. The benefit of e-documents is that they can be updated quickly and at no cost to the FIA. Therefore, members are advised to ensure that they always have the latest versions at their disposal.