



ANSI/TIA/EIA-568-B.3-1-2002  
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TIA/EIA-568-B.3-1

# TIA/EIA STANDARD

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## Optical Fiber Cabling Components Standard

### Addendum 1 – Additional Transmission Performance Specifications for 50/125 $\mu\text{m}$ Optical Fiber Cables

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**TIA/EIA-568-B.3-1**

(Addendum No. 1 to TIA/EIA-568-B.3)

APRIL 2002

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**Additional Transmission Performance Specifications for  
50/125  $\mu\text{m}$  Optical Fiber Cables**

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## **FOREWORD**

(This foreword is not a part of this Addendum.)

In 1996, applications and cabling groups began discussing the need for multimode fiber cabling to support high data rate applications for private networks. The move toward high-speed ( $\geq 1$  gigabit-per-second) LANs requires the faster modulation capabilities of laser transmitters like the vertical cavity surface emitting laser (VCSEL) or the edge-emitting semiconductor laser diode. Unlike the less coherent light emitting diodes (LEDs), laser transmitters typically excite only a subset of the fiber modes available. This change in transmitter property requires compatible specifications on both the transmitter launch conditions and the fiber modal dispersion properties to support these high-speed LAN applications.

In March 1999, the United States Technical Advisory Group (US TAG) requested that the Telecommunications Industry Association (TIA) TR-42 Engineering Committee on User Premises Telecommunications Cabling Infrastructure develop a recommended US position for ISO/IEC JTC1 SC 25/WG 3 on "Next-Generation Optical Fiber Cabling." TR-42 assigned the task to TR-42.8, the Optical Fiber Cabling Subcommittee, which, in turn, accepted the assigned project. The TR-42.8 Subcommittee cooperated with the following standard groups that are related to this activity.

- a) TIA TR-42.1 – Commercial Building Cabling Subcommittee
- b) TIA FO-2.2 – Digital Multimode Systems Subcommittee
- c) US TAG to ISO/IEC JTC 1/SC 25/WG 3
- d) IEEE 802.3ae 10 Gigabit Ethernet Task Force

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This Addendum to ANSI/TIA/EIA-568-B.3 has been prepared by the TR-42.8 Subcommittee and approved by the Technical Committee TR-42.

Annex A is informative and not considered to be requirements of this Addendum.

## 1. INTRODUCTION

### 1.1 Purpose

This Addendum specifies additional component and transmission requirements for a 50/125  $\mu\text{m}$  optical fiber cable capable of supporting 10 Gb/s serial transmission up to 300 m (984 ft) using 850 nm nominal wavelength lasers. These cables are suitable for use in accordance with ANSI/TIA/EIA-568-B.1.

## 2. SCOPE

### 2.1 Applicability

This Addendum specifies minimum requirements for this optical fiber telecommunications cable used within a commercial building and between buildings in a campus environment.

In addition to the requirements specified in this Addendum, this cable shall meet all of the requirements of ANSI/TIA/EIA-568-B.3 and any of its respective addenda. This addendum provides requirements for multimode cable with higher performance over other multimode cable specified in ANSI/TIA/EIA-568-B.3 and recognizes advances in cabling and optical transceiver technology, particularly technologies based on vertical cavity surface emitting lasers (VCSELs).

### 2.2 Normative references

The following standards contain provisions that, through reference in this text, constitute provisions of this Addendum. At the time of publication, the editions indicated were valid. All standards are subject to revision; parties to agreements based on this Addendum are encouraged to investigate the possibility of applying the most recent editions of the standards indicated. ANSI and TIA maintain registers of currently valid national standards published by them.

- ANSI/TIA/EIA-568-B.1, *Commercial Building Telecommunications Cabling Standard, Part 1, General Requirements*, 2001
- TIA/EIA-492AAAC, *Detail specification for 850-nm laser-optimized, 50- $\mu\text{m}$  core diameter/125- $\mu\text{m}$  cladding diameter class 1a graded-index multimode optical fibers*, 2002

## 3. OPTICAL FIBER CABLES

### 3.1 General

This clause specifies additional component and transmission requirements for a 50/125  $\mu\text{m}$  optical fiber cable capable of supporting 10 Gb/s serial transmission up to 300 m (984 ft) using 850 nm nominal wavelength lasers. These cables are suitable for use in accordance with ANSI/TIA/EIA-568-B.1.

### 3.2 Cable transmission performance

The cabled fiber shall meet the graded performance specifications of table 1 of this Addendum.

**Table 1 – Additional optical fiber cable transmission performance parameters**

Optical fiber cable type	Wavelength (nm)	Maximum attenuation (dB/km)	Minimum information transmission capacity for overfilled launch <sup>1</sup> (MHz•km)	Minimum information transmission capacity for laser launch <sup>1</sup> (MHz•km)
850 nm laser-optimized 50/125 μm (per TIA/EIA-492AAAC)	850	3.5	1500	2000
	1300	1.5	500	Not Required
<p>NOTES</p> <p>1 – The information transmission capacity of the fiber, as measured by the fiber manufacturer, can be used to demonstrate compliance with this requirement. “Minimum information transmission capacity for overfilled launch” is referred to as “Overfilled modal bandwidth-length product” in the TIA/EIA-492AAAC. “Minimum information transmission capacity for laser launch” is referred to as “Effective modal bandwidth-length product at 850 nm ensured by differential mode delay at 850 nm” in TIA/EIA-492AAAC.</p>				

## 4. PATCH CORDS

### 4.1 General

This clause contains the performance specifications for the optical patch cords recognized in this Addendum. These patch cords are used to connect optical fiber links at cross-connects and as equipment or work area cords used to connect telecommunications equipment to horizontal or backbone cabling.

### 4.2 Patch cord cable

An 850 nm laser-optimized 50/125 μm optical fiber patch cord shall be a cable of an indoor construction containing fiber that meets the requirements of table 1.

## ANNEX A (informative) BIBLIOGRAPHY AND REFERENCES

This annex is informative only and is not part of this Addendum.

This annex contains information on the documents that are related to or have been referenced in this document. Many of these documents are in print and are distributed and maintained by national or international standards organizations. These documents can be obtained through contact with the associated standards body or designated representatives. The applicable electrical code in the United States is the National Electrical Code<sup>®</sup> (NEC<sup>®</sup>).

- ANSI/EIA/TIA-455-B-1998, Standard Test Procedures for Fiber Optic Fibers, Cables and Transducers, Sensors, Connecting and Terminating Devices, and other Fiber Optic Components
- FOTP-203 (EIA/TIA-455-203), Launched Power Distribution Measurement Procedure for Graded Index Multimode Fiber Transmitters
- FOTP-204 (TIA/EIA-455-204), Measurement of Bandwidth on Multimode Fiber
- ITM-3 (TIA/EIA-TSB62-3), Mode Power Distribution and Mode Transfer Function Measurement.
- ITM-20 (TIA/EIA-TSB62-20), Enhanced Bandwidth Performance over Laser-Based, Multimode Fiber Local Area Networks
- TIA/EIA-492AAAC, Detail specification for 850-nm laser-optimized, 50- $\mu\text{m}$  core diameter/125- $\mu\text{m}$  cladding diameter class 1a graded-index multimode optical fibers





