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TIA STANDARD

Optical Fiber Cabling and Components Standard

ANSI/TIA-568.3-E
(Revision of TIA-568.3-D)

September 2022

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OPTICAL FIBER CABLING AND COMPONENTS STANDARD

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FOREWORD

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

This Standard was developed by TIA Subcommittee TR-42.11.

Approval of standard

This Standard was approved by the Telecommunications Industry Association (TIA) Subcommittee TR-42.11, TIA Engineering Committee TR-42, and the American National Standards Institute (ANSI).

ANSI and TIA review standards every 5 years. At that time, standards are reaffirmed, withdrawn, or revised according to the submitted updates. Updates to be included in the next revision should be sent to the committee chair or to ANSI or TIA.

Contributing organizations

More than 30 organizations within the telecommunications industry (including manufacturers, consultants, end users, and other organizations) contributed their expertise to the development of this Standard.

Documents superseded

This Standard replaces ANSI/TIA-568.3-D, published in October 2016, and incorporates content from ANSI/TIA-568.3-D-1, published in January 2019.

Significant technical changes from the previous edition

- Incorporates below content from ANSI/TIA-568.3-D-1.
    - Adds OM5 fiber cabling color designation.
    - Removes OM1 and OM2 fiber cabling color designations.
    - Modifies multimode reference-grade to standard-grade loss allowance to 0.5dB.
    - Moves OS1, OM1 and OM2 connector and adapter color identification to Annex as part of grandfathered specifications.
    - Adds ISO/IEC cabled fiber type designations (OS1a) to harmonize with and ISO/IEC 11801-1.
- Adds Type-A fiber transition definition and two new fiber transition variants – Type-U1 and Type-U2.
- Adds new connectivity Methods U1 and U2.
- Adds ANSI/TIA-492AAAF detail specifications for multimode optical fibers, which cancels and replaces ANSI/TIA-492AAAA, -492AAAB, -492AAAC, -492AAAD, and -492AAAE.
- Adds ANSI/TIA-492CAAC detail specifications for single-mode optical fibers, which cancels and replaces ANSI/TIA-492CAAA and ANSI/TIA-492CAAB.
- Specifies B-652.D or B-657 as acceptable fiber for Single-mode Indoor-Outdoor, Inside Plant and Outside Plant cables.
- Adds IEC optical fiber designations (A1-OM5, -OM4, -OM3) to harmonize with IEC 60793-2.
- Adds description and reference for testing cable plant terminated with array connectors.

Relationship to other TIA standards and documents

The following are related standards regarding various aspects of structured cabling that were created under TIA TR42.

- ANSI/TIA-568.0, *Generic Telecommunications Cabling for Customer Premises*
- ANSI/TIA-568.1, *Commercial Building Telecommunications Cabling Standard*
- ANSI/TIA-568.2, *Balanced Twisted-Pair Telecommunications Cabling and Components Standard*
- ANSI/TIA-568.4, *Broadband Coaxial Cabling and Components Standard*
- ANSI/TIA-569, *Telecommunications Pathways and Spaces*
- ANSI/TIA-570, *Residential Telecommunications Infrastructure Standard*
- ANSI/TIA-606, *Administration Standard for Telecommunications Infrastructure*
- ANSI/TIA-607, *Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises*
- ANSI/TIA-758, *Customer-Owned Outside Plant Telecommunications Infrastructure Standard*
- ANSI/TIA-862, *Structured Cabling Infrastructure Standard for Intelligent Building Systems*
- ANSI/TIA-942, *Telecommunications Infrastructure Standard for Data Centers*
- ANSI/TIA-1005, *Telecommunications Infrastructure Standard for Industrial Premises*
- ANSI/TIA-1179, *Healthcare Facility Telecommunications Infrastructure Standard*
- ANSI/TIA-4966, *Telecommunications Infrastructure for Educational Facilities*

Following is the schematic relationship between the ANSI/TIA-568 series and other relevant standards.

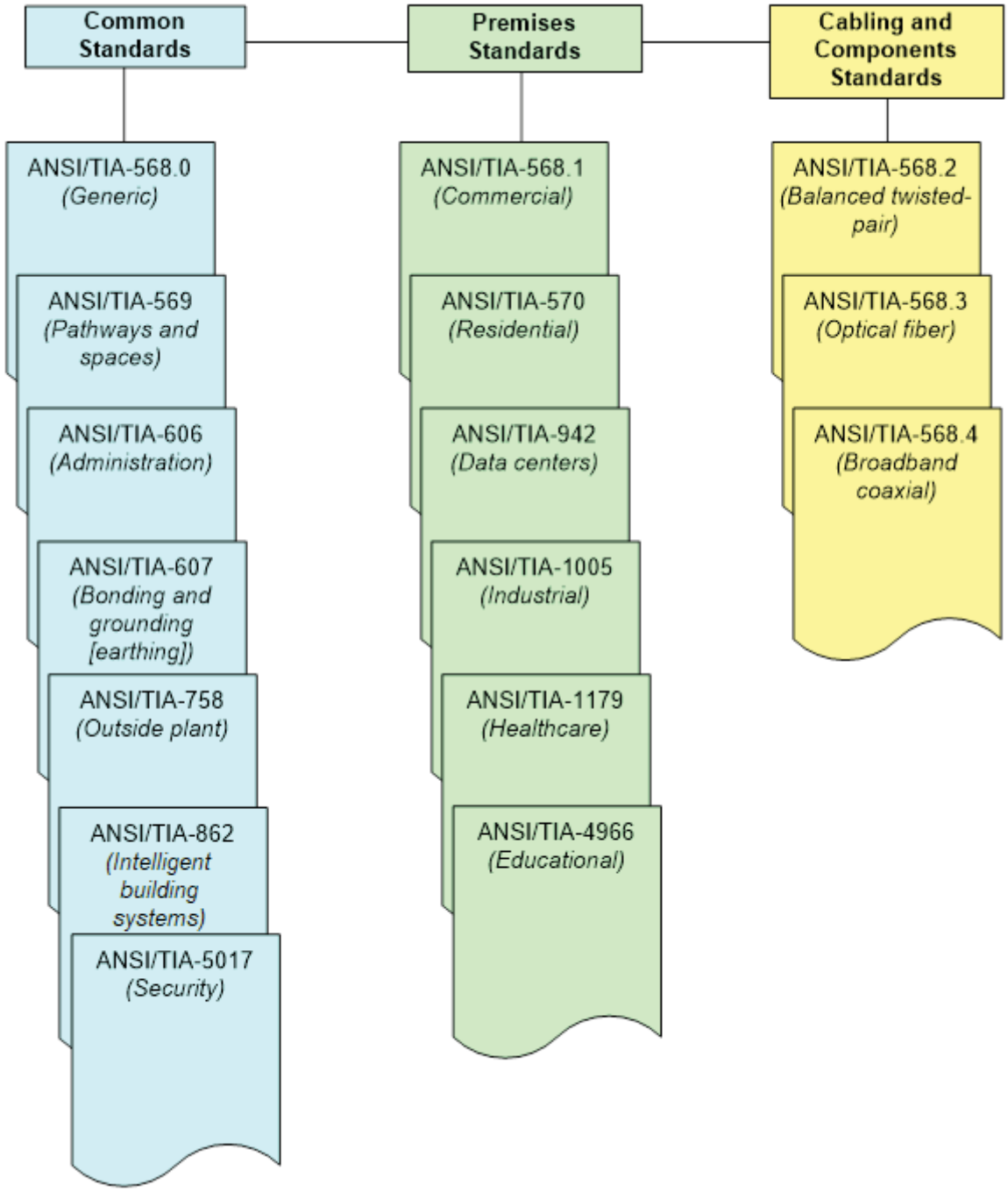

Figure 1 – Illustrative relationship between the ANSI/TIA-568 series and other relevant TIA standards

The following documents produced by IEEE and the National Fire Protection Association (NFPA) may be useful to the reader:

a) *National Electrical Safety Code*® (NESC®) (IEEE C2-2012)

b) *National Electrical Code*® (NEC®) (NFPA 70-2014)

Useful supplements to this Standard are BICSI's *Telecommunications Distribution Methods Manual,* the *Outside Plant Design Reference Manual,* and the *Information Technology Systems Installation Methods Manual*. These manuals provide practices and methods by which many of the requirements of this Standard are implemented.

Other references are listed in Annex F.

Annexes

There are six annexes to this Standard. Annex A, Annex B, Annex C and Annex D are normative and considered requirements of this Standard. Annex E and Annex F are informative and not considered requirements of this Standard.

Purpose

The purpose of this Standard is to specify cabling and component requirements for premises optical fiber cabling. It is intended to be used by manufacturers; however, manufacturers, users, designers and installers will find this Standard useful. Additionally, this Standard is intended to be used as a reference by the suites of common standards and premises cabling standards listed in the Foreword.

Specification of criteria

Two categories of criteria are specified: mandatory and advisory. The mandatory requirements are designated by the word "shall"; advisory requirements are designated by the words "should", "may", or "desirable" which are used interchangeably in this Standard.

Mandatory criteria generally apply to protection, performance, administration and compatibility; they specify minimally acceptable requirements. Advisory criteria are presented when their attainment may enhance the general performance of the cabling system in all its contemplated applications.

A note in the text, table, or figure is used for emphasis or offering informative suggestions, or providing additional information.

Metric equivalents of United States (US) customary units

The dimensions in this Standard are metric or US customary with approximate conversion to the other.

Life of the Standard

This Standard is a living document. The criteria contained in this Standard are subject to revisions and updating as warranted by advances in building construction techniques and telecommunications technology.

1 SCOPE

This Standard is applicable to premises optical fiber cabling and components. Specified in this Standard are requirements for components (e.g., cable, connectors, connecting hardware, patch cords), connectivity and cabling. Test and measurement requirements are also incorporated into this Standard.

2 NORMATIVE REFERENCES

The following standards contain provisions that, through reference in this text, constitute provisions of this Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

Fiber optic test procedures (FOTPs):

- TIA-455-1, *Cable Flexing for Fiber Optic Interconnecting Devices*
- TIA-455-2, *Impact Test Measurements for Fiber Optic Devices*
- TIA-455-4, *Fiber Optic Component Temperature Life Test*
- TIA-455-5, *Humidity Test Procedure for Fiber Optic Components*
- TIA-455-6, *Cable Retention Test Procedure for Fiber Optic Cable Interconnecting Devices*
- TIA-455-8, *Measurement of Splice or Connector Loss and Reflectance Using an OTDR*
- TIA-455-13, *Visual and Mechanical Inspection of Fiber Optic Components, Devices, and Assemblies*
- TIA-455-21, *Mating Durability Of Fiber Optic Interconnecting Devices*
- TIA-455-34, *Interconnection Device Insertion Loss Test*
- TIA-455-36, *Twist Test For Fiber Optic Connecting Devices*
- ANSI/TIA-455-78, *Optical Fibres Part 1-40: Measurement Methods and Test Procedures – Attenuation*
- TIA-455-107, *Determination of Component Reflectance or Link/System Return Loss Using a Loss Test Set*
- ANSI/TIA-455-171, *Attenuation by Substitution Measurement for Short-Length Multimode Graded-Index and Single-Mode Optical Fiber Cable Assemblies*
- TIA-455-185, *Strength of Coupling Mechanism for Fiber Optic Interconnecting Devices*
- TIA-455-188, *Low-Temperature Testing of Fiber Optic Components*

Fiber standards:

- ANSI/TIA-492AAAF, *Detail Specification for Class 1a Graded-Index Multimode Optical Fibers; Modifications of IEC 60793-2-10:2019, Optical Fibres – Part 2-10: Product Specifications – Sectional Specification for Category A1 Multimode Fibres*
- ANSI/TIA-492CAAC, *Sectional Specification for Class B Single-Mode Optical Fibers*

Cabled fiber standards:

- ANSI/TIA-598, *Optical Fiber Cable Color Coding*
- ICEA S-83-596, *Standard for Indoor Optical Fiber Cable*
- ICEA S-87-640, *Standard for Optical Fiber Outside Plant Communications Cable*