

Issue 37 • Quarter 4, 2022

Standards Quarterly Update:

What you need to know now for the future of your network

Welcome to the 37th edition of the *Standards Advisor*. This report is issued quarterly and provides updates on the standards relevant to the structured cabling industry, and the impact they have on your network design, planning and operations.

This summary represents standards meetings held during the fourth quarter of 2022 and reports on activities from all aspects of the cabling industry. These activities range from the applications standards (IEEE 802.3 and T11 Fiber Channel) to the cabling standards (ANSI/TIA, ISO/IEC, IEC, ITU-T and CENELEC). It also covers new developments in the world of multi-source agreements (MSAs).

73rd ISO/IEC JTC1/ SC25 WG3: No meetings were held in Q4, 2022

The next scheduled ISO/IEC JTC1/SC25 WG3 meeting will be held February 27 to March 3, 2023, Virtual meeting.

TIA TR-42: October 3-7, 2022, St. Petersburg, FL, USA and virtual meeting

The following were approved for ballot, re-ballot, or default ballot:

- ANSI/TIA-1179-A Healthcare.
- ANSI/TIA-568.1-E.1 Addendum for single pair.
- ANSI/TIA-942-C Data Centers.
- ANSI/TIA-4966-A-1 Single Pair in Education.
- ANSI/TIA-1183-B Balun-less measurement methods.
- ANSI/TIA-568-5-1, addendum to ANSI/TIA-568.5.
- TIA TSB-184-A-2, power delivery over single-pair.
- ANSI/TIA-568.7 Industrial single-pair.
- ANSI/TIA-1005-B, Industrial.
- ANSI/TIA-4920000-C, adoption of IEC 60793-2 Optical fibres – Production specifications.
- ANSI/TIA-621.1, adoption of IEC 61755-1:2022 SM connector optical interfaces – General and guidance.
- ANSI/TIA-622.1, adoption of IEC 61755-2-1:2022 SM connector optical interfaces – Non-angled physical contact fibre.
- ANSI/TIA-622.2, adoption of IEC 61755-2-2:2022 SM connector optical interfaces – Angled physical contact fibre.

The following were published or approved for publication or reaffirmation:

- ANSI/TIA-568.0-E.1 Addendum for single pair.
- ANSI/TIA-862-C Intelligent Building Systems.
- ANSI/TIA-569-E-1 Updated environmental requirements per ASHRAE updates.
- ANSI/TIA-5071 Testing of single-pair.
- ANSI/TIA-568.4-E Coaxial cabling systems.

- ANSI/TIA-526-14-D, adoption of IEC 61280-4-1:2021 Installed cabling plant Multimode attenuation measurement.
- ANSI/TIA-568.3-E Optical Fiber Cabling and Components.
- ANSI/TIA-455-111 (FOTP-111), adoption of IEC 60793-1-34 Measurement methods – Fibre curl.
- ANSI/TIA-622.4, adoption of IEC 61755-2-4:2015 Non-angled physically contacting fibres, reference connection.
- ANSI/TIA-622.5, adoption of IEC 61755-2-5:2015 Angled physically contacting fibres, reference connection.

1. TR-42.1 Commercial Building Cabling

- ANSI/TIA-568.0-E.1 Addendum for single pair was published.
- ANSI/TIA-862-C Intelligent Building Systems was published.
- Ballot ANSI/TIA-5017-A Security was to close October 24.
- Resolved comments and approved another ballot circulation of ANSI/TIA-1179-A Healthcare.
- Resolved comments on ANSI/TIA-942-C Data Centers. Another ballot was circulated, closes December 12.
- Ballot circulated for ANSI/TIA-757-C Outside Plant. Closes December 16.
- New Project and ballot authorized for ANSI/TIA-568.1-E.1, addendum to add single pair, closes 1/12/2023.
- New project and ballot authorized for ANSI/TIA-4966-A-1, addendum to add single-pair for education, closes 1/12/2023.
- New project for ANSI/TIA-570-E, Residential cabling, update to ANSI/TIA-570-D, no ballot yet.
- Discussion of new work on immersion cooling for data centers.

2. TR-42.3 Pathways and Spaces

- Noted that reaffirmation of ANSI/TIA-5048 AIM systems also reaffirms the addendum ANSI/TIA-5048-1.
- Maintenance of ANSI/TIA-607 Grounding and Bonding and ANSI/TIA-569-E Pathways and Spaces to be discussed next time.

3. TR-42.5 Definitions

- The following definition was added:
 - Equal level transverse conversion transfer loss: A calculation, expressed in dB, of the difference between measured transverse conversion transfer loss and the differential mode insertion loss of the pair.

4. TR-42.7 Copper Cabling Systems

- ANSI/TIA-5071 Testing of single-pair was published.
- ANSI/TIA-568.4-E Coaxial cabling systems was published.
- Resolved comments and authorized a default ballot circulation of ANSI/TIA-1183-B Balun-less measurement methods.
- Resolved comments and authorized circulation of another ballot for TIA TSB-184-A-2, power delivery over single-pair.
- Resolved comments and authorized circulation of ballot for ANSI/TIA-568-5-1, addendum to ANSI/TIA-568.5.
- Approved project for ANSI/TIA-568.2-E, revision of ANSI/TIA-568.2-D, initial draft to be reviewed next time.

5. TR-42.9 Industrial Telecommunications Infrastructure

- Resolved comments and authorized another ballot for ANSI/TIA-568.7 Industrial single-pair, to close 1/12/2023.
- After a long delay, resolved comments on ANSI/TIA-1005-B, and authorized industry ballot, to close 1/12/2023.

6. TR-42.11 Optical Fiber Systems

- ANSI/TIA-568.3-E Optical Fiber Cabling and Components. Document has been published.
 - Added new fiber transitions (Type-U1 and Type-U2) and polarity methods (Method U1 and Method U2). The color identification for MM APC MPO connector is specified as Green (same as the SM APC color). This color designation is applicable to adapter housing and either the connector plug body or strain relief, or both (unless other colors are used for some other purposes)
 - Fiber transitions have changed from pinned to unpinned, and trunk cables have been changed from unpinned to pinned. The previous pin configurations in Revision D are still applicable for legacy installations.
 - B-652.D and B-657 fiber can both be used for SM Indoor-Outdoor, Inside Plant, and Outside Plant cables.
- ANSI/TIA-526-14-D, Adoption with modification of IEC 61280-4-1:2021 Installed cabling plant - Multimode attenuation measurement. Default ballot passed with one editorial comment. Document is approved for publication.
- Discussions surrounding Tier 1 (OLTS) vs Tier 2 (OTDR) testing requirements in TIA, and the discrepancies to IEC and ISO/IEC. A taskforce was created to further study the topic.
- ANSI/TIA-568.3-E Addendum. On-going discussions on incorporating the polarity symbols from TSB-5069.

7. TR-42.12 Optical Fibers and Cables

- ANSI/TIA-492 series restructuring project
 - ANSI/TIA-4920000-C, Adoption with modification of IEC 60793-2 Ed9. Document was approved for committee ballot.
 - ANSI/TIA-492AAAF-1, Adoption with modification of IEC 60793-2-10 Ed7.1. New project was approved to adopt with modification of the consolidated version of IEC 60793-2-10 published in January 2023.
- ANSI/TIA-455-111 (FOTP-111), adoption of IEC 60793-1-34 Measurement methods – Fibre curl. Ballot passed and approved for publication.
- Revision of ANSI/TIA-598-D-2014 Optical Fiber Color Coding
 - Ink draw down procedure proposal was presented. The taskforce group will meet prior to the next TIA meeting to review the procedures in detail and revise if needed. The agreed procedure will be used for the next phase of the Munsell/CIELAB round robin study.

8. TR-42.13 Passive Optical Devices and Metrology

- IEC adoption projects continue to progress.
 - ANSI/TIA-621.1, adoption of IEC 61755-1:2022 General and guidance. Approved for committee ballot.
 - ANSI/TIA-622.1, adoption of IEC 61755-2-1:2022 Non-angled physically contacting fibres. Approved for committee ballot.
 - ANSI/TIA-622.2, adoption of IEC 61755-2-2:2022 Angled physically contacting fibres. Approved for committee ballot.
 - ANSI/TIA-622.4, adoption of IEC 61755-2-4:2015 Non-angled physically contacting fibres, reference connection. Ballot passed, will be published in early 2023.
 - ANSI/TIA-622.5, adoption of IEC 61755-2-5:2015 Angled physically contacting fibres, reference connection. Ballot passed, will be published in early 2023.
- There was a new FOCIS document proposal on Alignment Independent Multifiber (AIM) connector. This AIM connector is compatible with both SAC (SN) and MDC connector and requires either SAC or MDC connector for breakout patching. Due to the SAC and MDC connectors are still under development in IEC SC86B, TR42.13 decided not to pursue this FOCIS standardization until the SAC/MDC are more stable.
- There is a call for interest for new activities. A few proposals were discussed during the meeting: connector cleaning recommendations for top of the cell tower installations; standards surrounding visual inspection; invited speakers from COBO to share their development; joint effort between Ethernet Alliance and TIA for interoperability testing; multicore fiber connector standardization (on-going work in ITU-T). Multiple committee members plan to bring in contributions at the next meeting.

The next scheduled TIA TR-42 meeting will be held January 30 - February 3, 2023, Tampa, FL, USA.

CENELEC TC86BXA: November 22-24, 2022, Paris, France

1. WG1 - Connector sets and interconnect components to be used in optical fibre communication systems

The following document will be revised once the documents IEC 61755-3-1 and -2 reaches CDV level in IEC SC86B:

For more information, visit commscope.com

- EN 50377-2-1: "Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications - Part 2-1: Type FC-PC terminated on IEC 60793-2 category B1 singlemode fibre
- EN 50377-2-2: "Connector sets and interconnect components

to be used in optical fibre communication systems - Product specifications - Part 2-2: FC/APC 8 terminated on IEC 60793-2-50 category B1.1 and B1.3 singlemode fibre, with full zirconia ferrule, category C"

- EN 50377-6-1: "Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications - Part 6-1: Type SC-RJ terminated on IEC 60793-2 category A1a and A1b multimode fibre"
- EN 50377-6-2: "Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications - Part 6-2: SC-RJ single mode terminated on IEC 60793-2-50 category B1.1 and B1.3 singlemode fibre, category U"
- EN 50377-11-1: "Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications - Part 11-1: Type MF terminated on IEC 60793-2-50 category B1.1 and B1.3 singlemode fibre for category C"
- EN 50377-17-1: "Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications - Part 17-1: Type FPFT (factory polished field terminated) simplex connector factory terminated with EN 60793-2-50 category B1.3 fibre and field mounted onto IEC 60793-2-50 category B1.3 or B6a_1 or B6a_2 singlemode fibre, category C"

Documents listed for withdrawal:

- EN 50377-3-1: "Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications - Part 3-1: Type SG terminated on IEC 60793-2-10 category A1a, A1b or equivalent multimode fibre for category C"
- EN 50377-18: "Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications - Part 18-1: type 4+4x10.3125 Gb/s MPO (QFSP) transceiver mated with an MPO connector equipped with 12 fibre PPS ferrules terminated on EN 60793-2-10 category A1a.3a or A1a.3b 50/125 micron multimode fibre"

2. WG2 - Fibre management systems and protective housings to be used in optical fibre communication systems

New work item:

- EN 50411-3-10: "Fibre management systems and protective housings to be used in optical fibre communication systems - Product specifications - Part 3-10: Free-breathing terminals, category A, for FTTH optical drop cable networks."

The following document will be revised:

- EN 50411-2-10: "Fibre management system, splice wall box, for category C & A".

The following documents will be submitted to the national committees for final voting:

- EN 50411-3-1: "Fibre management system, splice wall box, for category C & A".
- EN 50411-3-2: "Single-mode mechanical fibre splice"

The following documents were published:

- EN 50411-3-6: "Multimode mechanical fibre splice"
- EN 50411-6-1: "Unprotected microduct for categories A and S".

Documents listed for withdrawal:

- EN 50411-2: "General and guidance for optical fibre cable joint closures, protected microduct closures, and microduct connectors."
- EN 61758-1: "Interface standard for closures - Part 1: General and guidance"

[The next scheduled CLC TC86BXA meeting will be held June 6-7, 2023, Brussels, Belgium.](#)

IEEE 802.3 Ethernet: Plenary meeting—November 14-17, 2022, Bangkok Thailand
Interim meeting—October 1 - December 31, 2022, Virtual meeting

IEEE 802 continued face-to-face plenaries with remote access (a "hybrid" meeting) in November 2022, while the IEEE 802.3 working group and Task Forces continue to hold interim meetings electronically. IEEE 802 will continue to hold hybrid meetings, and IEEE 802.3 is expected to transition back to in-person interaction in the first half of 2023; however, remote access and interim task force telephonic meetings are expected to continue.

Single-twisted-pair copper standards

1. IEEE P802.3da Single Pair Multidrop Segments Enhancement Task Force

- The main progress in this group was consideration of decision trees for completing the work, which seemed to be stalled. The November meeting focused on decisions and progress on meeting the powering objectives for the project.
- The Task Force adopted a [revised timeline in July 2022](#) targeting a 1.0 draft specification out of the November 2022 meeting, and the Chair noted that this was already slipping.
- This project is developing extensions to the Clause 147 10BASE-T1S multidrop (10 Mbps shared media) PHY defined in 802.3cg, interoperable with the PHY in 802.3cg. The major objectives the project is working on include the following (for more objectives, [see objectives on the IEEE 802.3da site](#):

1. Adding interoperable multidrop power over Ethernet and reach extensions for multidrop to better accommodate building automation.
 2. Extending multidrop networks to support at least 16 nodes and 50m of reach (32 nodes and 70m are desired, but the objective is only 16 nodes and 50m)
 3. Define plug-and-play multidrop powering, and
 4. Selecting a single equipment connector.
- The Task Force has adopted a baseline and is in Task Force review of a protocol for automatically configuring the node ID's associated with the (IEEE 802.3cg) Clause 148 Physical Layer Collision Avoidance (PLCA) protocol. The task force has also adopted minor corrections to the PLCA (Clause 148) state diagrams to eliminate potential race conditions and improve predictable behavior.
 - The Task Force is focused on reusing the already specified active PHY components of the 10BASE-T1S PHY in IEEE Std 802.3cg clause 147. This has been problematic as the goals of reach extension and increased node count for the project must rely entirely on specifications for the interface or the cabling. The project has produced a consensus model for connecting nodes to the mixing segment, and this has yet to produce baseline proposals meeting the objectives of a plug-and-play multidrop network specification.
 - Since September, the main effort of the Task Force has been focused

on powering. The Task Force is building consensus on a model which provides some minimal power (~0.5W/node) for nodes on the data pair and optionally controls power on an auxiliary pair. Presentations have begun to explore the necessary features for powering control, and are expected to result in adopted baselines in early 2023.

2. IEEE P802.3cy Greater than 10 Gb/s Electrical Automotive Ethernet Task Force

- This project is developing new electrical (as opposed to optical) PHY specification for greater than 10 Gb/s Ethernet, at distances of up to 11m, suitable for automotive use. It is primarily driven by requirements for autonomous vehicle networking, and the project scope includes both symmetric and asymmetric transmission (where one of the directions is at a much lower speed).
- The 802.3cy draft entered the final stage of balloting and completed the initial IEEE SA ballot in December 2022. Comments will be resolved in January 2023, and at least on recirculation is expected, with the standard complete by June 2023.
- The 802.3cy draft includes:
 - Link segment electrical parameters, based on channels with shielded differential pair cabling suitable for automotive use, with 8 GHz bandwidth. Both twisted pair or parallel pair constructions are considered. Because it is required to operate in an automotive environment, this cabling differs from existing twinax data center cabling.
 - A 25 Gb/s PHY using PAM-4 line coding at about 14 Gbaud and Reed-Solomon FEC.
 - Specifications for Energy Efficient Ethernet operation including links with asymmetric data rates
- While motivated by automotive applications, the standard does not limit the application of the PHY and may find use in short-range high-speed applications on shielded balanced pair cabling which could be used as an alternative to direct-attach twinaxial cables.

3. IEEE P802.3dg 100 Mb/s Long-Reach Single-Pair Ethernet Task Force

- IEEE P802.3dg continued solidifying requirements for applications for 100 Mb/s long-reach single-pair Ethernet (likely called 100BASE-T1L). The new 100BASE-T1L project objectives is a 500m-reach 100 Mb/s PHY for industrial and building automation environment, with line powering, and supporting low latency operations.
- The project adopted a baseline for insertion loss supporting 500 meters of single-pair (16 AWG) cabling and up to 5 connectors. The insertion loss also supports shorter reaches using thinner copper cabling. The baseline calls for the cabling to be specified up to a frequency of 60 MHz.
- Due to the prevalence of connectors and the long reach, the project heard a proposal for a time-domain approach to specifying residual echo on links. In contrast to traditional return loss specifications this would separate the effects of matching segments (and connecting hardware) at connectors from the structural return loss of the cabling itself. No baseline is adopted as yet.
- The project began hearing PHY presentations and is expected to converge on PAM-based PHYs, either PAM-3, PAM-4, or PAM-5. This discussion is expected to continue at least through the January 2023 interim.

Optical Fiber Standards

4. IEEE P802.3cs Central office consolidation (super PON) Task Force

- The work of the IEEE P802.3cs Task Force completed with the approval of IEEE Std 802.3cs-2022 by the IEEE-SA Standards Board.

5. IEEE P802.3cw 400 Gb/s Operation over DWDM Systems Task Force

- This project was split from P802.3ct for the 400G objective.
- The main objective is:
 - 400 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system (400GBASE-ZR).
- DP-16QAM coherent modulation format will be used for 400GBASE-ZR.
- Draft 2.0 was reviewed by the Working Group.

6. IEEE P802.3cz Multi-Gigabit Optical Automotive Ethernet Task Force

- This project will define the performance characteristics of an automotive link segment and an optical PHY to support 2.5, 5, 10, 25, and 50 Gb/s over 40 m of automotive cabling.
- This Task Force will focus on glass fiber and P802.3dh will focus on plastic optical fiber.
- Draft 3.1 was reviewed by the Standards Association.
- Draft 3.2 was generated for Standards Association review.

7. IEEE P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force

- The work of the IEEE P802.3db Task Force completed with the approval of IEEE Std 802.3db-2022 by the IEEE-SA Standards Board.

8. IEEE P802.3df 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet Task Force

- This Task Force will be split into P802.3df and P802.3dj
- The objectives for P802.3df include:
 - 400G over 4 pairs of SMF up to 2 km
 - 800G over 8 pairs of MMF up to 50 m
 - 800G over 8 pairs of MMF up to 100 m
 - 800G over 8 pairs of SMF up to 500 m
 - 800G over 8 pairs of SMF up to 2 km
- The objectives for P802.3dj will include:
 - 200G over 1 pair of SMF up to 500 m
 - 200G over 1 pair of SMF up to 2 km
 - 400G over 2 pairs of SMF up to 500 m
 - 800G over 4 pairs of SMF up to 500 m
 - 800G over 4 pairs of SMF up to 2 km
 - 800G over 1 pair of SMF with 4 wavelengths over 2 km
 - 800G over 1 pair of SMF up to 10 km
 - 800G over 1 pair of SMF up to 40 km
 - 1.6T over 8 pairs of SMF up to 500 m
 - 1.6T over 8 pairs of SMF up to 2 km
- Baseline proposals are being considered.
- Draft 1.0 was reviewed by the Working Group.

9. IEEE Greater than 50 Gb/s Bidirectional Optical Access Study Group

- This Study Group will investigate 100G and 400G over 10, 20, and 40 km using bidirectional transmission.

The next scheduled meeting of IEEE 802.3 will be an electronic IEEE 802.3 interim meeting from January 16-19, 2023. IEEE 802.3 Task Force electronic Interims are expected to continue telephonically in the meantime, and through the beginning of March 2023. IEEE 802.3 will meet at the hybrid IEEE 802.3 plenary in Atlanta, Georgia USA from March 13-16, 2023. IEEE 802.3 is expected to resume in-person meetings (with remote access) by May 2023. Information on plenary and working group interims can be found at <https://www.ieee802.org/3/interims/index.html> and information on electronic access to 802.3 interims and task force meetings is at <http://www.ieee802.org/3/calendar.html>

1. Common Electrical Interface – 224G Development Project (CEI-224G)

- This project will develop a body of knowledge summarized into a white paper that will enable new project launches for specific next generation 224 Gbps clauses.
- PAM4, PAM6, and PAM8 modulation formats are being considered.

2. Co-Packaging Framework Project

- The Co-Packaging Framework IA is an umbrella project that will study the application spaces and relevant technology considerations for co-packaging of communication interfaces with one or more ASICs.
- Co-packaging Framework Document was published.

3. Implementation Agreement for a 3.2 Tb/s Co-Packaged Optical (CPO) Transceiver

- This Implementation Agreement specifies key aspects and electro-optical-mechanical details of a 3.2Tb/s Co-Packaged Optical Module.
- This project will draw on 400G-FR4 and 400G-DR4 IEEE standards as well as the CPO JDF.
- Draft Implementation Agreement is under review.

The next scheduled OIF Standards meeting will be held on January 9-13, 2023 in Indian Wells, California, USA.

INCITS Fiber Channel T11.2: December 6-8, Virtual & Face-to-face meeting, Deerfield Beach, FL, USA

1. FC-PI-8 Ad Hoc (128GFC Serial)

- Committee ballot passed successfully. Document is currently in First Public Review stage, closing on January 17, 2023.

2. FC-PI-9 (256GFC)

- The project request has been approved. There will not be a MRD (Marketing Requirement Document) from the FCIA board.
- Project is in early development study phase. Committee will continue to collect data to define requirements such as baud

rate, variants and reaches (MM/SM/Backplane) and module form factors.

- IEEE 200Gb/s per lane development updates were shared. BiDi (850nm and 910nm) proposal was reviewed, and it is considered as a possible solution pending further clarity on 256G VCSEL feasibility and timeline.

The next scheduled INCITS T11 meeting will be virtual/face-to-face on February 7-9, 2023, Tucson, AZ, USA.

IEC SC48B: September 12-16, 2022, Virtual meeting

- The IEC 63171 Ed.2 “basic” standard is still under preparation at the Committee Draft (CD) stage with closing date for comments in March 2023.
- The IEC 63171-1 Ed.2 for Type 1 “Copper LC style” is under preparation at the Committee Draft for Vote (CDV) with document circulation in February 2023.
- Work is ongoing for clarifying contact resistance measurement points and vibration fixturing for typical connector measurement.

The next scheduled IEC SC48B meeting will be virtual on March 13-17, 2023.

IEC SC86A: October 24 through November 4, 2022, San Francisco, CA, USA

1. IEC SC86A/WG1: Fibres and Cables/Fibres and associated measuring methods

Documents in revision:

- IEC 60793-1-40: Attenuation measurement methods (2CD)
- IEC 60793-1-41: Bandwidth (CDV)
- IEC 60793-1-45: Mode field diameter (CDV)
- IEC 60793-1-46: Monitoring of changes in optical transmittance (WD)
- IEC 60793-2-40: Sectional specification for category A4 multimode fibres (WD)
- IEC 60793-2-50: Sectional specification for category B single-mode fibres (CDV)
- IEC 60793-2-60: Sectional specification for category C single-mode fibres (WD)
- IEC TR 62284: Effective area measurements of single-mode optical fibres – Guidance (CD)

Published documents:

- IEC 60793-1-1: Measurement methods and test procedures – General and guidance. Anticipate being published in 2023-01
- IEC 60793-1-44: Fibre cut-off. To FDIS and directly to publication.

2. IEC SC86A/WG3: Fibres and Cables/Cables

Documents in revision:

- IEC 60794-1-1: Generic specifications - General (FDIS)
- IEC 60794-1-21: Mechanical test methods (1CD)
- IEC 60794-2-10: Family specification for simplex and duplex cables (FDIS)
- IEC 60794-2-50: Indoor cables for patchcords (FDIS)

New standards in progress:

(NOTE: 60794-1-1xx series is being split from 60794-1-21, 60794-1-2xx series is being split from 60794-1-22, 60794-1-3xx series is being split from 60794-1-23)

- IEC 60794-1-101: Method E1 Tensile (1CD)
- IEC 60794-1-104: Method E4 Impact (1CD)
- IEC 60794-1-110: Method E10 Kink (WD)
- IEC 60794-1-111: Method E11 Bend (CDV)
- IEC 60794-1-124: Method E24 – New Installation test for microduct cabling (1CD)
- IEC 60794-1-126: Method E26 – Galloping (WD)
- IEC 60794-1-131: Method E31 - Microduct inner clearance test (WD)
- IEC 60794-1-134: Method E34 - Coefficient of dynamic friction between cables (WD)
- IEC 60794-1-136: Push force (WD)
- IEC 60794-1-201: Method F1 Temperature Cycling (CDV)
- IEC 60794-1-205: Method F5 (A, B, C) Water Penetration (WD)
- IEC 60794-1-207: Method F7 Nuclear radiation (1CD)
- IEC 60794-1-208: Method F8 Pneumatic resistance (1CD)
- IEC 60794-1-209: Method F9 Ageing (CDV)
- IEC 60794-1-212: Method F12 Temp cycling for terminated cables (CDV)
- IEC 60794-1-214: Method F14 Cable UV resistance test (1CD)
- IEC 60794-1-217: Method F17 Cable shrinkage (fibre protrusion) (CDV)
- IEC 60794-1-301: Method G1 Bend test (FDIS)
- IEC 60794-1-302: Method G2 Ribbon dimensions and geometry – visual method (1CD)
- IEC 60794-1-303: Method G3 Aperture gauge (CDV)
- IEC 60794-1-305: Method G5 Ribbon tear- separability (FDIS)
- IEC 60794-1-306: Method G6 Ribbon Torsion (FDIS)
- IEC 60794-1-307: Method G7 Tube kinking (CDV)
- IEC 60794-1-308: Method G8 Ribbon residual twist test (FDIS)
- IEC 60794-1-309: Method G9 Bleeding and evaporation (FDIS)
- IEC 60794-1-311: Method G11A Tensile strength and elongation test for cable elements (WD)
- IEC 60794-1-312: Method G11B Elongation test for buffer tubes (WD)
- IEC 60794-7: Fire resistant optical fibre data communication cables (CD)
- IEC 60794-8: Automotive cables (WD)
- IEC TR 63442: Rodent resistance (2CD)

Documents withdrawn:

- IEC 60794-1-24 Electrical test methods. Split into 60794-1-401, -1-402, -1-403 and -1-404

The next scheduled IEC SC86A meeting will be held on May 9-12, 2023, Japan

IEC SC86B: October 24 through November 4, 2022, San Francisco, CA, USA

1. WG4: Standard tests and measurement methods

A large number of documents are in revision or planned for revision:

- IEC 61300-1/AMD1 Amendment - Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance (1CD)
- IEC 61300-2-1: Vibration (sinusoidal) (FDIS)
- IEC 61300-2-2: Mating durability (WD)
- IEC 61300-2-6: Strength of coupling mechanism (FDIS)
- IEC 61300-2-11: Axial compression (CDV)
- IEC 61300-2-19: Damp heat (steady state) (WD)
- IEC 61300-2-21: Composite temperature/humidity cyclic test (2CD)
- IEC 61300-2-22 : Change of temperature (CDV)
- IEC 61300-2-26: Salt mist (CDV)
- IEC 61300-2-27: Dust (2CD)
- IEC 61300-2-33: Assembly and disassembly of fibre optic mechanical splices, fibre management systems and closures (2CD)
- IEC 61300-2-34: Resistance to solvents and contaminating fluids of interconnecting components and closures (CDV)
- IEC 61300-2-38: Sealing for pressurized fibre optic closures (CDV)
- IEC 61300-2-44: Flexing of the strain relief of fibre optic devices and components (1CD)
- IEC 61300-2-50: Fibre optic connector proof test with static load - Singlemode and multimode (WD)
- IEC 61300-3-3: Active monitoring of attenuation and return loss (CDV)
- IEC 61300-3-6: Return loss (WD)
- IEC 61300-3-14: Error and repeatability of the attenuation settings of a variable optical attenuator (WD)
- IEC 61300-3-27: Method for measurement of hole/fibre core position of rectangular ferrules (4CD)
- IEC 61300-3-30: Endface geometry of rectangular ferrule (WD)
- IEC 61300-3-34: Attenuation and return loss of random mated connectors (WD)
- IEC 61300-3-45: Attenuation of random mated multi-fibre connectors (FDIS)
- IEC 61300-3-46: MT Ferrule Bore Diameter Measurement (2CD)
- IEC 61300-3-48: Spring compression force of the coupling sleeve for rectangular ferrule multi-fibre connectors (WD)
- IEC 61300-3-50: Crosstalk for optical spatial switches (WD)
- IEC 61300-3-52: Guide hole and alignment pin deformation constant, CD for 8 degree angled PC rectangular ferrule, single mode fibres (WD)

Documents prepared for publication:

- IEC 61300-2-18: Dry heat -High temperature endurance
- IEC 61300-3-4: Attenuation

Documents published in 2022:

- IEC 61300-1: General and guidance.
- IEC 61300-2-5: Torsion test
- IEC 61300-2-43: Screen testing of return loss of single-mode PC optical fibre connectors
- IEC 61300-2-46: Damp heat, cyclic (Corrigendum)
- IEC 61300-3-33: Withdrawal force from a resilient alignment sleeve using pin gauges
- IEC 61300-3-35: Visual inspection of fibre optic connectors and fibre-stub transceivers

2. WG6: Standards and specifications for fibre optic interconnecting devices and related components

Documents in revision:

- IEC 61753-021-02: Fibre optic connectors terminated on single-mode fibre to category C (FDIS)
- IEC 61753-021-06: Grade B/2 single-mode fibre optic connectors for category OP (FDIS)
- IEC 61754-13: Type FC-PC connector (1CD)
- IEC 61755-3-1: Connector parameters of dispersion unshifted single-mode physically contacting fibres - non-angled 2,5 mm and 1,25 mm diameter cylindrical full zirconia ferrules (2CD)
- IEC 61755-3-2 Ed2: Connector parameters of dispersion unshifted single mode physically contacting fibres – angled 2,5 mm and 1,25 mm diameter cylindrical full zirconia ferrules (2CD)
- IEC 61755-3-5: Connector parameters of non-dispersion shifted single mode physically contacting fibres - non-angled 2,5 mm and 1,25 mm diameter cylindrical composite ferrule using Cu-Ni-alloy as fibre surrounding material (3CD)
- IEC 61755-3-7: Connector parameters of non-dispersion shifted single mode physically contacting fibres - non-angled 2,5 mm and 1,25 mm diameter cylindrical composite ferrules using titanium as fibre surrounding material (3CD)
- IEC 61755-3-8: Connector parameters of non-dispersion shifted single mode physically contacting fibres – angled 2,5 mm and 1,25 mm diameter cylindrical composite ferrules using titanium as fibre surrounding material (3CD)

New standards in progress:

- IEC 61753-022-07: Hardened fibre optic connectors terminated on multimode fibre for category A – Outdoor aerial environment (2CD)
- IEC 61753-022-13: Fibre optic connectors terminated on multimode fibre for category OP+ HD – Extended outdoor protected environment with additional heat (2CD)
- IEC 61754-36: Fibre optic connector interfaces- Part 36: Type SAC connector family (FDIS)
- IEC 61754-37: Fibre optic connector interfaces- Part 37: Type MDC connector family (FDIS)
- IEC 61754-7-4 – Fibre optic connector interfaces – Part 7-4: Type MPO connector family – One fibre row 16 fibres wide (4CD)
- IEC 61754-7-5– Fibre optic connector interfaces – Part 7-4: Type MPO connector family – Three fibre rows (2CD)
- IEC 62005-9-5 for the reliability qualification of sealed closures (1CD)
- IEC 62664-1-2: LC-APC duplex singlemode connectors terminated on IEC 60793-2-50 category B1.1 and B1.3 fibre (NP)
- IEC 62664-1-3: LC-PC duplex singlemode connectors terminated on IEC 60793-2-50 category B1.1 and B1.3 fibre (NP)
- IEC 62664-1-10 ED1: MPO-PC multimode connectors terminated on IEC 60793-2-10 category A1-OM2b to A1-OM5b fibre (NP)
- IEC 63267-2-1: Connection of multimode non-angled physically contacting fibres (CDV)
- IEC 63267-2-2: Connection of 50 µm core diameter multimode physically contacting fibres - Non-angled for reference connector application, at wavelength of 850 nm using selected A1a fibre only (2CD)
- IEC TR 63323 Ed1: Fibre optic interconnecting devices and passive components – A study of an SC connector adaptor with safety lock mechanism. (2CD)

Documents prepared for publication:

- IEC TR 62627-1: : Fibre optic connector cleaning methods
- IEC 63267-1: Optical interfaces for multimode fibres - General and guidance

Published standards in 2022:

- IEC 61754-20: Amendment Type LC connector family
- IEC 61754-4: Type SC connector family
- IEC 61754-6: Type MU connector family
- IEC 61755-1: Optical interfaces for single mode non-dispersion shifted fibres (CDV)
- IEC 61755-2-1: Connection parameters of non-dispersion unshifted physically contacting fibres - non-angled
- IEC 61755-2-2: Connection parameters of dispersion unshifted physically contacting fibres – angled

3. WG7- Standards and specifications for fibre optic passive components

Documents in progress:

- IEC 61753-071-02/AMD1 :Non-connectorized single-mode fibre optic 1 x 2 and 2 x 2 spatial switches for category C - Controlled environments (1CD)
- IEC 61753-081-02: Non-connectorized single-mode fibre optic middle-scale 1 x N DWDM devices for category C. (FDIS)
- IEC 61753-081-03: Non-connectorized single-mode fibre optic middle-scale 1 x N DWDM devices for category OP – Outdoor protected environment (FDIS)
- IEC 61753-081-06: Non-connectorized single-mode fibre optic middle-scale 1 x N DWDM devices for category OP+ – Extended outdoor protected environment (FDIS)
- IEC 61753-082-02: Part 082-02: Pigtailed single-mode fibre optic 1,31/1,55 µm WWDM devices for category C - Indoor controlled environment (1CD)
- IEC 62005-2-1: Qualification of passive optical components (2CD)

Published standards in 2022:

- IEC 61753-043-02: Simplex patch-cord style single-mode fibre wavelength selective devices with cylindrical ferrule connectors for category C - Controlled environment
- IEC 61753-051-02: Single mode fibre plug style fixed attenuator
- IEC 61753-053-02: Non-connectorized, single-mode fibre, electrically controlled, variable optical attenuator for category C - Controlled environments
- IEC 61753-089-02: Non-connectorised single-mode bidirectional OTDR monitoring WWDM for category C - Indoor controlled environment
- IEC 61753-091-02: Single mode fibre optic pigtailed style circulators for category C
- IEC 62077: Generic specification for circulators.(FDIS)

The next scheduled IEC SC86B meeting will be held March 20-24, 2023, Putrajaya, Malaysia.

1. IEC SC86C/WG1: Fibre optic systems and active devices / Fibre optic communications systems and sub-systems

Documents in revision:

- IEC 61280-4-2: Single-mode fibre optic cable plant attenuation measurement (2CD)
- IEC TR 61282-14: Determination of the uncertainties of the attenuation measurement of cable plants (1CD)

Published documents:

- IEC 61280-1-4: Light source encircled flux measurement method. Approved for publication, anticipate being published in Q1 2023.
- IEC 61280-4-1 Corrigendum: Multimode fibre optic cable plant attenuation measurement. Approved for publication, anticipate being published in Q1 2023.
- IEC 61280-4-3: Installed PON – Attenuation and optical return loss measurements

The next scheduled IEC SC86C meeting will be held on April 17 & 19, 2023, Virtual meeting

IEC TC46 SC46C/WG7: Week of November 30th, Arlington, VA, USA.

- SC25-WG3 implemented a channel denomination name change for single-pair Ethernet (SPE) systems. The channels B and C have been renamed to C and D. The current drafts of IEC 61156-11 and -13 will be editorially updated to reflect the change. In addition to changes in the naming convention, WG3 has identified balance limits for the system. This prompted IEC to establish balance limits for their cabling in the absence of a measurement method. The group is left to identify measurement methods for SPE cables and determine if the chosen limits are appropriate.
- Related to this topic, WG7 agreed to start the revision of IEC 61156-12 as the IEC 61156-11 project now has reached a sufficient maturity. Similarly, the IEC 61156-14 document will be started since the IEC 61156-13 project now has reached a sufficient maturity.

The next scheduled IEC TC46 SC46C/WG7 meeting will be held the week of April 17th, 2023, Paris, France.

ITU-T SG15 WP2: No meetings were held in Q4, 2022

The next scheduled ITU-T SG15 meeting will be held on April 17-28, 2023, Geneva, Switzerland.

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