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The Standards Advisor

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Standards Quarterly Update:

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

Welcome to the 31st 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 second quarter of 2021 and reports on activities from all aspects of the cabling industry. These activities range from the applications standards (IEEE 802.3 and 802.11 and T11—Fiber Channel) to the cabling standards (ANSI/TIA, ISO/IEC, CENELEC). It also covers new developments in the world of multi-source agreements (MSAs).

ISO/IEC JTC1/SC25 WG: No meetings were held in Q2, 2021

During Q2, the following documents were published:

- ISO/IEC 18598 amd 1 ed 1 AIM Systems
- ISO/IEC 11801-3 amd 1 Generic cabling for industrial premises
- ISO/IEC 14763-4 ed 2 End-to-end links, MPTL, direct attach

The 71st ISO/IEC JTC1/SC25 WG3 meeting will be a virtual meeting to be held September 20-24, 2021.

TIA TR-42 meeting: June 14-18, 2021, Virtual meeting

Executive Summary

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

- ANSI/TIA-568.5 Balanced Single Twisted-Pair Telecommunications Cabling and Components Standard
- ANSI/TIA-862-C, intelligent buildings cabling revision
- ANSI/TIA-942-B-1, edge data centers
- ANSI/TIA-606-D, administration
- ANSI/TIA-568.3-E, Optical Fiber Cabling Component Standard
- ANSI/TIA-455-3-C (FOPT-3), Procedure to Measure Temperature Cycling Effects on Optical Fiber Units, Optical Cable, and Other Passive Fiber Components
- ANSI/TIA-526-7-A (2015), Adoption of IEC 61280-4-2 ed. 2, Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant, as re-affirmation of ANSI/TIA-526-7-A (2021)

The following standards were re-affirmed or approved for publication:

- ANSI/TIA-607-D-1, bonding and grounding
- ANSI/TIA-1152A, field testing
- ANSI/TIA-5048-1: AIM: Adoption of ISO/IEC 18598-1
- ANSI/TIA-526-28, Adoption of IEC 612800-4-5:2020, Attenuation measurement of MPO terminated fibre optic cabling plant using test equipment with MPO interfaces
- ANSI/TIA-492AAAF, Adaption of IEC 60793-2-10:2019, Optical fibres – Part 2-10: Product specifications – Sectional specification for category A1 multimode fibres
- ANSI/TIA-492CAAC, Adaption of IEC 60793-2-50:2018, Optical fibres – Part 2-50: Product specifications – Sectional specification for class B singlemode fibres
- ANSI/TIA-604-19 (FOCIS 19), Fiber Optic Connector Intermateability Standard - Type SEN Connector (aka. CS connector)
- ANSI/TIA-604-10 (FOCIS 10), Fiber Optic Connector Intermateability Standard - Type LC

1. TR-42.1 Commercial Building Cabling

- ANSI/TIA-568.0-E-1 amendment remains on hold to wait for progress on dependent documents
- ANSI/TIA-758-C OSP: Industry ballot has not been circulated yet
- ANSI/TIA-862-C, revision ballot comments were resolved and a default ballot authorized
- ANSI/TIA-942-B-1, edge data centers: Comments were resolved, industry ballot was authorized
- ANSI/TIA-4966, education standard: Industry ballot has not been circulated yet
- ANSI/TIA-942-C, data centers: Project and PAR approved, will incorporate '-B-1, work will start when that publishes
- ANSI/TIA-1179, healthcare, revision of '1179: Project approved, work to start
- ANSI/TIA-5017, security: Project approved, work to start when editor is found

- ANSI/TIA-4994 and TIA-TSB-5046, sustainability: Will be withdrawn
- Several other documents under 42.1 control are nearing their dues dates for maintenance, and will be reviewed in October

2. TR-42.3 Pathways and Space

- ANSI/TIA-607-D-1 for bonding and grounding: Ballot comments were reviewed and the document was approved for publication
- ISO/IEC 18598 AMD 1 for AIM was reviewed and agreed, and a ballot for adopting it as an addendum to TIA-5048 was approved
- ANSI/TIA-606-D Administration: Ballot comments were reviewed reviewed and the document will be circulated as a 2nd industry ballot
- A liaison letter was sent to NFPA to clarify rules about using building metal in the grounding system for equipment and telecommunications grounding

3. TR-42.5 Telecommunications Infrastructure Terms and Symbols

- Acronyms added
  - API application programming interface
  - CFD computational fluid dynamics
  - COP coefficient of performance
  - MTBF mean time between failures
  - MTTR mean time to repair
  - OT operational technology
  - PoE power over Ethernet
  - PUE power usage effectiveness
  - RFID radio frequency identification
  - WUE water usage effectiveness
- Definitions added
  - cage: A secured space for housing ICT equipment
  - telecommunication bonding conductor: A conductor that interconnects the telecommunications bonding infrastructure to the building's service equipment (power) ground (formerly known as the bonding conductor for telecommunications).
- Definitions deferred
  - edge data center: A small data center in a pre-manufactured enclosure that is continuously monitored and located at the network edge supporting equipment and applications (It is unclear whether the committee will require that an EDC be off-site pre-fabricated, or allow a portion of a permanent building to be classified as an EDC)

4. TR42.7 Copper Cabling Systems

- TR42.7 completed comment resolutions for the ballot of ANSI/TIA-568.5, single pair cabling and components standard. Another industry ballot reflecting these changes was authorized
- A task group continues to study the far end grounding issue for TCL. The study will clarify the dependency of a single pair channel on the grounding of the far end. Test samples are needed for round robin testing planned. This TG work is being delayed by the virus
- A task group report on thermal performance of single-pair cables continues to work
- A new TSB for power delivery using single-pair will be an addendum to 184-A instead of a new TSB
- TIA-TSB-5021 for the use of cat 5e and 6 to support 2.5GBASE-T and 5GBASE-T was re-affirmed
- ANSI/TIA-568.6 Single-pair multi-drop received two new contributions which were reviewed and we hope for more in October

5. TIA TR42.9 Industrial Cabling

- ANSI/TIA-1005-B, revision of A, remains on hold pending further progress on ANSI/TIA-568.7
- ANSI/TIA-568.7 for balanced single twisted-pair for industrial premises: Little progress has been made, and editor change has been made, and TG meetings will be held July 14 and August 11.

6. TR-42.11 Optical Fiber Systems

- ANSI/TIA-526-14-D, Revision of ANSI/TIA-526-14-C, Optical Power Loss Measurement of Installed Multimode Fiber Cable Plant.
  - 1st ANSI ballot is currently open and closes on 7/12. No comments to date.
- ANSI/TIA-526-28, Adoption of IEC 61280-4-5:2020, Attenuation measurement of MPO terminated fibre optic cabling plant using test equipment with MPO interfaces
  - 1st ANSI ballot comment resolution was completed.
  - There were editorial correction comments to the IEC base document content, which will be identified in the TIA foreword. A US contribution to IEC SC86C WG1 with these corrections will be made.
  - Document with incorporated comment resolution is approved for publication.
- ANSI/TIA-526-7-A, Adoption of IEC 61280-4-2 ed. 2, Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant
  - ANSI/TIA-526-7-A (2015) is approved to be balloted as re-affirmation to ANSI/TIA-526-7-A (2021).
- ANSI/TIA-568.3-E, Revision of ANSI/TIA-568.3-D, Optical Fiber Cabling Component Standard
  - 2nd ANSI ballot comment resolution was completed.
  - Approved to submit draft document with incorporated comment resolutions as 3rd ANSI industry ballot.
  - Significant technical changes since last ballot include:
    - The fiber transition (aka fanout/breakout) specified in TIA-568.3-D will be identified as Type-A fiber transition.
    - All existing Methods A, B and C will revert to TIA-568.3-D using Type-A fiber transition.
    - Two new types of fiber transition Type-U1 and Type-U2, will be specified.
    - Two new polarity methods, Method U1 and Method U2, will be specified. There is an existing patent relevant to Method U1, and a patent holder statement has been submitted to TIA-TR42.

7. TR-42.12 Optical Fiber and Cable

- TIA-492 Series Restructuring
  - ANSI/TIA-492000, Adaption of IEC 60793-2:2019.
    - Need to determine whether IEC published a newer version for TIA adaption.
  - ANSI/TIA-492AAAF, Adaption of IEC 60793-2-10:2019.
    - Errata (on fiber cross reference naming convention) will be sent to TIA for publication.
  - ANSI/TIA-492CAAC, Adaption of IEC 60793-2-50:2018.
    - Errata (on fiber cross reference naming convention) will be sent to TIA for publication.
- ANSI/TIA-598-E, Revision of ANSI/TIA-598-D, Optical Fiber Cable Color Coding
  - Munsell measurements from additional vendor were incorporated into the overall round robin data set.
  - Committee will continue the study – golden sample color chips will be sent to participating companies to perform inter-company measurements.
  - Interim meeting will be held to discuss colorimeter settings.
- ANSI/TIA-455 Series Adoptions
  - ANSI/TIA-455-3-C (FOTP-3), Revision of TIA-455-3B, Procedure to Measure Temperature Cycling Effects on Optical Fiber Units, Optical Cable, and Other Passive Fiber Components.
    - Ballot is currently open and closes on July 12.

- ANSI/TIA-455-111-B (FOTP-111), Adoption of IEC 60793-1-34:2021, Measurement Methods and Test Procedures Fibre Curl.
  - IEC document was recently published in March 2021. TIA adoption project is open.
- ANSI/TIA-455-80-D (FOTP-80), Adoption of IEC 60793-1-44:2011, Optical fibres – Part 1-22 Measurement Methods and Test Procedures – Cut-off wavelength
  - Confirmed that document has been published.
- ANSI/TIA-455-133-B (FOTP-133), Adoption of IEC 60793-1-22:2001, Optical fibres – Part 1-44 Measurement Methods and Test Procedures – Length Measurement
  - Project is open, document will go to ballot.
- ANSI/TIA-455-203-B (FOTP-203), Adoption of IEC 61280-1-4:2009, Fibre Optic Communication Subsystem Test Procedures – Part 1-4: General Communication Subsystems (Light Source Encircled Flux Measurement Method
  - Project is open, document will go to ballot.
- ANSI/TIA-455-204-B (FOTP-204), Adoption of IEC 60793-1-41:2010, Optical fibres – Part 1-41: Measurement Methods and Test Procedures – Bandwidth
  - Project is open, document will go to ballot.

- Recession/Obsolete Documents
  - FOTP-30, Frequency Domain Measurement of Multimode Optical Fiber Information Transmission Capacity.
    - Liaison letter announcing the withdrawal was reviewed, approved, and will be sent to TR42 to send to IEEE.
  - FOTP-54, Mode Scrambler Requirements for Overfilled Launching Conditions to Multimode Fibers.
    - Liaison letter announcing the withdrawal was reviewed, approved, and will be sent to TR42 to send to IEEE.
  - FOTP-124, Polarization-Mode Dispersion Measurement for Single-mode Optical Fibers by Interferometry.
    - Liaison letter announcing the withdrawal was reviewed, approved, and will be sent to TR42 to send to ICEA.

8. TR-42.13 Optical Passive Devices and Metrology

- ANSI/TIA-604-19 (FOCIS 19), Fiber Optic Connector Intermateability Standard - Type SEN Connector (aka. CS connector)
  - Committee completed ballot comment resolution. Document with incorporated resolution is approved for publication.
- ANSI/TIA-604-10 (FOCIS 10), Fiber Optic Connector Intermateability Standard - Type LC
  - No comments received from most recent ballot. Document is approved for publication.
- SN/MDC Standardization
  - Committee reviewed a proposal to standardize the SN and MDC connector within TIA (adoption of IEC development) - FOCIS documents in TR42.13 subcommittee and TIA-568.3 polarity specifications in TR42.11 subcommittee.
  - A TR42.11/TR42.13 joint meeting will be held at the October 2021 meeting to discuss next steps.
- Test Procedure Harmonization between TIA and IEC
  - A test procedure comparison between TIA-568.3 and IEC 61753-21-2 was presented. The TIA-455 series is referenced in TIA-568.3-D Annex A and the IEC 61300 series is referenced in IEC 61753-21-2.
  - Committee will continue the discussion on reconciling the specifications between TIA and IEC documents at future meetings.

9. TIA TR-42 Plenary

- TIA TR-42 reviewed the reports from each engineering sub-committee.

The next scheduled meeting of TIA TR-42 will be a virtual meeting to be held October 4-8, 2021.

CENELEC TC86BXA meeting: June 22, 2021, Virtual meeting

CLC TC86BXA: Fibre optic interconnect, passive and connectorised components

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

Documents in revision:

- EN 50377-15-1: Type MPO with 12 fibre PPS ferrules terminated on EN 60793-2 category A1a multimode fibre for 50/125 micron multimode fibre - macrobend enhanced fibre only.

New documents in progress:

- EN 50377-3-4: Type SC/APC simplex 9° terminated on EN 60793-2-50 of type B-652.D and B-657.A singlemode fibre with full zirconia ferrule, category OP.

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

Documents in revision:

- EN 50411-2-4: Sealed dome fibre splice closures for category S & A
- EN 50411-3-1: Fibre management system, splice wall box, for category C and G
- EN 50411-3-2: Single-mode mechanical fibre splice
- EN 50411-3-6: Multi- mode mechanical fibre splice
- EN 50411-6-1: Unprotected microduct for category S and A

The next scheduled meeting of CLC TC86BXA will be held in December, 2021, Brussels, Belgium.

IEEE 802.3 Ethernet meetings: Interim meeting—May 17-27, 2021
Interim Task Force Meetings from April 1, 2021 – June 1, 2021, Virtual meetings

Due to COVID-19, IEEE 802 and IEEE 802.3 continue to hold telephonic meetings in place of the scheduled face-to-face meetings. This is expected to continue until at least November 2021, and possibly into 2022.

The July 2021 IEEE 802 plenary and the September 2021 IEEE 802.3 Interim meetings are being held electronically.

1. IEEE 802.3cv Maintenance on 4 pair Power over Ethernet (PoE)

- This task force is cleaning up minor issues found in initial testing of the 802.3bt standard for 4 pair PoE. The modifications do not change the functionality and are not expected to present interoperability or compliance issues.
- IEEE Std 802.3cv-2021 was approved 9 May 2021 and has been published by IEEE-SA. It is available for purchase in the IEEE standards store and will be available for free under the IEEE Get program after 6 months. This concludes the Task Force's work.

Single-twisted-pair copper standards

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

- 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 15 nodes and 50m).
  - 3. Defining plug-and-play multidrop powering, and
  - 4. Selecting a single equipment connector.
  - The Task Force has adopted a baseline and begun Task Force review of the draft on 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 is preparing to adopt baseline proposals related to powering a multidrop segment.
  - The Task Force continues to work on defining the electrical parameters for the shared-media 'mixing segment' – wiring that connects the various multidrop nodes. Specifying the mixing segment to enable greater reach and an increased number of nodes appears to be the most difficult part of the work. The group is forming consensus around an open-source LTSpice model of the mixing segment which needs to be translated into deployment rules.
- The Task Force has indicated it intends to be communicating its work with TIA TR42.7 so that the two can produce aligned specifications for multidrop single-pair use in commercial building.
- The Task Force adopted a formal timeline resulting in a standard in mid 2023.

3. 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 25Gb/s, 50Gb/s, and 100Gb/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 project is focused 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.
- The group adopted a baseline to use multiple pairs to expand from 25Gb/s on a pair to 50 Gb/s on two pairs, and 100 Gb/s on four, all at a distance of up to 11m.
- The project adopted a formal timeline which results in a completed standard in Q3 2023.
- 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.

4. IEEE P802.3dd Maintenance #17: Power over Data Lines of Single Pair Ethernet

- This project has begun to adopt corrections to the specifications introduced by IEEE 802.3bu and IEEE 802.3cg. These address a number of technical and editorial issues found during the implementation of single-pair Ethernet powering using classification.
- Specifically, initial implementations for automotive applications did not use the classification functionality, and the interest and implementation of single-pair powering for in-building applications uncovered a number of specifications requiring minor modification.
- As a maintenance project, no new features (e.g., powering levels) may be added.

5. IEEE 802.3 Enhancements to point-to-point Single Pair Ethernet Study Group

- At the March 2021 IEEE 802.3 Plenary, a new study group was approved to develop Project Authorization Requests (PAR) and Criteria for Standards Development (CSD) responses for Enhancements to point-to-point Single Pair Ethernet to: (1) Support TSN, and (2) Support increasing traffic and speed needs with long reach point-to-point higher-speed single-pair PHYs
- This new study group is expected to produce two project requests, one quick, and the other representing a longer-term enhancement for single pair ethernet in buildings.
- The Task Force has produced a draft PAR and CSD response for supporting TSN, a near-term project to permit use of the new point-to-point 10 Mb/s Single Pair Ethernet PHYs (10BASE-T1L and 10BASE-T1S) specified by IEEE 802.3cg with the 802.3 specifications used for Time Sensitive Networking. This is expected to be a quick project without any functional changes, and is expected to be approved at the July 2021 802 Plenary.
- The Task Force is also working on the next speed enhancement for building automation and industrial automation distances with point-to-point single pair Ethernet, likely at 100 Mb/s. The existing 100Mb/s and faster single pair PHYs are primarily specified for automotive distances and environments, and this project would look to specify at least one long-reach PHY (likely at 100 Mb/s) for greater than 100m distance. This work is expected to continue past July. Procedurally, a new study group will be formed to continue work on the draft PAR for this effort.

Optical Fiber Standards

6. IEEE P802.3cp 10G, 25G, and 50G bidirectional access optical PHYs Task Force

- This Task Force is developing standards for bidirectional 10G, 25G, and 50G over 10, 20, and 40 km over a single strand of singlemode fiber.
- Draft 3.1 was reviewed by the Standards Association.
- Draft 3.2 will be reviewed by the Standards Association.

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

- The main objectives of this Study Group are:
  - Support a passive point-to-multipoint ODN with a reach of at least 50 km with at least 1:64 split ratio per wavelength pair
  - Support at least 16 wavelength pairs for point-to-multipoint PON operation
  - Support the MAC data rate of 10Gb/s downstream
  - Support the MAC data rates of 2.5Gb/s and 10Gb/s upstream
  - Support tunable transmitters
- Draft 2.1 was reviewed by the Working Group.

8. IEEE P802.3ct 100 Gb/s and 400 Gb/s Operation over DWDM Systems Task Force

- This project was split into P802.3ct for the 100G objective and P802.3cw for the 400G objective.
- The main objective is:
  - 100 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system (100GBASE-ZR).

- DP-DQPSK coherent modulation format will be used for 100GBASE-ZR
- The Task Force resolved comments from the Standards Association on Draft 3.4.
- The standard was submitted to RevCom.

9. **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 1.1 is under review by the Task Force.

10. **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.
- Task Force resolved comments against Draft 1.0.
- Draft 1.1 will be generated for Task Force review.

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

- This project will define standards for 100, 200, and 400 Gb/s over 50 m multimode fiber and over 100 m multimode fiber.
- This will allow for Top-of-Rack switch elimination by connecting Middle-of-Row switches directly to servers (VR).
- This will also provide switch-to-switch connectivity and support the installed base of multimode fiber (SR).
- Draft 1.0 was reviewed by the Task Force.
- Draft 1.1 is under review by the Task Force.

The next scheduled meeting of IEEE 802.3 will be a virtual meeting to be held July, 12-22, 2021

IEEE 802.3 Task Force electronic Interims are expected to continue to be called weekly as needed.

OIF Standards meeting: May, 2021, Virtual meeting

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.
- Draft framework paper is under review by Working Group.

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

- This Implementation Agreement specifies key aspects and electo-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.
- Project was launched at the February meeting.

The next meeting of OIF Standards will be held in August, 2021, Virtual meeting.

INCITS Fiber Channel T11.2: June, 8-9, 2021, Virtual meeting

1. **FC-PI-8 (128GFC Serial)**

- IEEE 802.3ck Project Status Review - T11.2 will continue to monitor and leverage IEEE 802.3ck development for 128GFC (FC-PI-8).
- Baseline Proposal for 128GFC MMF Links - Committee reviewed proposals for multiple parameters.
  - 60m/100m OM3/OM4 MMF reach
  - Transmit characteristics were reviewed. Two parameters average launch power and overshoot/undershoot are still TBD.
  - Receive characteristics and test methodology were reviewed.
  - Overall link budget was reviewed, with the assumption of 128GFC uses reference receiver with a 15-tap equalizer (Ethernet contains a 12-tap equalizer).
  - Target to vote on the various parameters at the August meeting.
- 2km SMF Variant
  - Committee reviewed 2km single mode variant, data still needs to be collected.
  - Committee will consult FCIA regarding 2km reach and total connector loss (i.e. what channel topologies are expected for 128GFC 2km solution). Current FCIA requirement is 10km.
- Target first committee ballot in the August-October 2021 timeframe.

The next meeting of INCITS T11 will be held August 16-19, 2021, Virtual/face-to-face hybrid meeting.

IEC SC86A: Fibres and Cables

WG1: Fibres and associated measuring methods

Documents in revision:

- IEC TR 62000 ED3: Guidelines for combining different single - mode fibre sub-categories. Completed comment resolution.
- IEC TR 62285 ED3: Application guide for non-linear coefficient measuring methods. Ballot is still open to date, closes on April 9th.
- IEC 60793-2-10/AMD1 ED7: Amendment 1 - Optical fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibres. Ballot is still open to date, closes on May 7th.
- IEC 60793-1-44 ED3. Pre-CD will move to CD ballot.
- IEC 60793-1-1 Ed5: Measurement methods and test procedures – General and guidance. Discussions regarding packing during meeting will be incorporated into document for review. Once reach consensus, document will move to CD circulation.
- IEC 60793-2-60 Ed2, C single-mode intraconnection fibres. A presentation will be prepared for review at the fall FOCI meeting.

New standards in progress:

- IEC TR 63309 ED1: Active fibres - Characteristics and Measurement Methods – Guidance. Completed 1st CD ballot, document will move to 2nd CD.

Published documents:

- IEC 60793-2-40/Ed4: Optical fibres – Part 2-40: Product specifications – Sectional specifications for category A4 multimode fibres.
- IEC 60793-1-34 ED3: Optical fibres - Part 1-34: Measurement methods and test procedures - Fibre curl.

WG3: Cables

Documents in revision:

- 60794-1-1 Ed 4.0 2015: Optical fibre cables - Part 1-1: Generic specification - General
- 60794-1-2 Ed 5.0 2021: Standard | Optical fibre cables - Part 1-2: Generic specification - Basic optical cable test procedures - General guidance
- 60794-1-20: Generic specification - Basic optical cable test procedures - General and definitions
- 60794-1-21 Ed 1.0 2015: Generic specification - Basic optical cable test procedures - Mechanical tests methods
- 60794-1-22 Ed 2.0 2017: Generic specification - Basic optical cable test procedures - Environmental test methods
- 60794-1-23 Ed2 2019: Generic specification - Basic optical cable test procedures - Cable element test methods
- 60794-2-10 Ed2 2011: Indoor optical fibre cables - Family specification for simplex and duplex cables
- 60794-2-24: Generic specification - Basic optical cable test procedures - Electrical test methods
- 60794-3 Ed4 2014: Outdoor cables - Sectional specification

TR soon to be published:

- TR 62959, Ed1 2020; stability date 2023 (Cable shrinkage)

New standards in progress:

- 60794-1-302 (Ribbon dimensions and geometry – visual method)
- 60794-1-303 (Ribbon dimensions – Aperture gauge)
- 60794-1-305 (Ribbon tear (separability
- 60794-7 (Fire resistant optical fibre data communication cables)

Published documents:

- IEC 60793-2 ED9: Optical fibres - Part 2: Product specifications – General

Publication forecasted for 2021:

- IEC 60793-2-40 Ed4: Optical fibres - Part 2-40: Product specifications - Sectional specification for category A4 multimode fibres
- IEC 60793-1-34 ED3: Optical fibres - Part 1-34: Measurement methods and test procedures - Fibre curl
- IEC TR 63309 ED1: Active fibres - Characteristics and Measurement Methods – Guidance

The next meeting of IEC SC86A will be held September 17-October 29, 2021, Virtual meeting.

IEC SC86B: Fibre optic interconnecting devices and passive components

WG4: Standard tests and measurement methods

A large number of documents are in revision:

- IEC 61300-1: General and guidance
- IEC 61300-2-1: Vibration (sinusoidal)
- IEC 61300-2-5: Torsion test
- IEC 61300-2-6: Strength of coupling mechanism
- IEC 61300-2-11: Axial compression
- IEC 61300-2-18: Dry heat -High temperature endurance
- IEC 61300-2-19: Damp heat (steady state)
- IEC 61300-2-22: Composite temperature/humidity cyclic test
- IEC 61300-2-33: Assembly and disassembly of fibre optic mechanical splices, fibre management systems and closures
- IEC 61300-2-34: Resistance to solvents and contaminating fluids of interconnecting components and closures
- IEC 61300-2-38: Sealing for pressurized fibre optic closures
- IEC 61300-2-43: Screen testing of return loss of single-mode PC optical fibre connectors
- IEC 61300-3-3: Active monitoring of attenuation and return loss
- IEC 61300-3-4: Attenuation
- IEC 61300-3-6: Return loss
- IEC 61300-3-7: Wavelength dependence of attenuation and return loss
- IEC 61300-3-27: Method for measurement of hole/fibre core position of rectangular ferrules
- 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. The method C for automated visual inspection will get a requirement that the operator is still requested to make a judgement. In case of a failing the requirements for visual inspection the connector shall be measured for attenuation and return loss.
- IEC 61300-3-45: Attenuation of random mated multi-fibre connectors
- IEC 61300-3-46: MT Ferrule Bore Diameter Measurement
- TR 63367 is a technical report from the industry round robin test and shows that visual inspection with microscopes with automated detection of scratches suffers from repeatability and reproducibility problems.

New standards in progress:

- IEC TS 63334: Conditions for testing the protection against dust and water ingress of passive optical protective housings and hardened fibre optic connectors (IP5X, IPX4, IPX5, IPX6). This document gives specific pass/fail criteria for optical fiber protective housings and hardened connectors when testing these products against IEC 60529 (IP intrusion protection).

Published documents:

- IEC 61300-2-10: Crush resistance. Load tests on street cabinets and on doors are added.
- IEC 61300-2-14: High optical power
- IEC 61300-3-30: Endface geometry of rectangular ferrule
- IEC 61300-3-53: Encircled angular flux (EAF) measurement method based on two-dimensional far field data from multimode waveguide (including fibre).

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

Documents in revision:

- IEC 61753-021-2: Fibre optic connectors terminated on single-mode fibre to category C. Decision is made to combine this document with IEC 61753-121-2: Simplex and duplex cords with single-mode fibre and cylindrical ferrule connectors for category C - Controlled environment
- IEC 61753-021-6: Grade B/2 single-mode fibre optic connectors for category OP
- IEC 61753-101-03: Performance standard for fiber management systems. Detailed fungus resistance test severities and pass/fail criteria were added. Fungus test will be according to IEC 60068-2-10 Variant 1, severity 1 (28 days). New pass/fail criterion was added: "When a rating 0 is obtained, the material is considered fungus resistant and no further testing is required. When a rating of 1 or 2 is obtained, the effect of mould growth shall be evaluated by measuring a representative performance property (e.g. tensile strength at yield and elongation at yield for thermoplastic polymers, a compression set, a Shore A hardness for elastic materials, or any other test which checks a relevant property) both before and after exposure of the material samples. The average change in mechanical characteristics of the tested material samples shall be less than 20 %. A rating of more than 2 is not allowed"
- IEC 61753-111-07 and -09: Performance standards for sealed closures. Detailed fungus and UV-light resistance requirements were added.
- IEC 61753-131-03: Performance standard for singlemode mechanical splices. Detailed fungus and UV-light resistance requirements were added.
- IEC 61755-1: Optical interfaces for single mode non-dispersion shifted fibres - General and guidance
- IEC 61755-3-1 and -3-2: Optical interface of connectors with full zirconia ferrxules. The CDV version was rejected by the National Committees. Major issue was the concern that the new non-oriented variants were not backward compatible with the previous oriented (or tuned) variant. No consensus was found in trying to resolve the comments. The project is sent back to the draft stage (CD), which means that there is no standard existing for the non-oriented Grade B and Grade C connectors with zirconia ferrules.
- 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.
- 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.
- 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.

New standards in progress:

- IEC 61754-36: Fibre optic connector interfaces- Part 36: Type SAC connector family
- IEC 61754-37: Fibre optic connector interfaces- Part 37: Type MDC connector family

- IEC 61754-7-x New standard of a single row 16 fiber multimode MPO was approved. The 8° angled multimode version will have improved return loss performance (≥ 45 dB when mated).
- IEC 62005-9-5 for the reliability qualification of sealed closures was proposed and approved.
- IEC 63267-1: Optical interfaces for multimode fibres - General and guidance.
- 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
- IEC PAS 63267-3-30: Fibre optic interconnecting devices and passive components - Fibre optic connector optical interfaces - Part 3-30: End face geometry angled PC end face PPS rectangular ferrule, multimode A1b fibres.
- IEC TR 63323 Ed1: Fibre optic interconnecting devices and passive components – A study of an SC connector adaptor with safety lock mechanism.

Published standards:

- IEC 61753-111-08: Performance requirements of sealed closures- category G

WG7- Standards and specifications for fibre optic passive components

Documents in progress:

- IEC 61753-043-2: Wavelength selective simplex cords with single-mode fibre and cylindrical ferrule connectors for category C
- IEC 61753-051-2: Single mode fibre plug style fixed attenuator
- IEC 61753-071: Non-connectorised single-mode fibre optic 1x2 and 2x2 spatial switches for category C
- IEC 61753-081-02: Non-connectorized single-mode fibre optic middle-scale 1 x N DWDM devices for category C
- IEC 61753-082-03: Non-connectorized single-mode fibre optic middle-scale 1 x N DWDM devices for category OP
- IEC 61753-082-06: Non-connectorized single-mode fibre optic middle-scale 1 x N DWDM devices for category OP+
- IEC 61753-085-2: Non-connectorized single-mode pigtailed CWDM devices for category C
- IEC 61753-089-2: Non-connectorised single-mode bidirectional OTDR monitoring WWDM devices for category C
- IEC 61753-091-2: Single mode fibre optic pigtailed style circulators for category C
- IEC 62005-9-1: reliability qualification of passive optical components
- IEC 62077: Generic specification for circulators

The next meeting of IEC SC86B will be held
September 17-October 29, 2021, Virtual meeting.

IEC SC86C WG1 meeting: April, 7th and 9th, 2021

IEC SC86C: Fibre optic systems and active devices

WG1: Fibre optic communications systems and sub-systems

Documents in revision:

- IEC 61280-1-3 General communication subsystems – Par 1-3: Central wavelength & spectral width measurement. Ballot passed without comments, document is approved for publication.
- IEC 61280-1-4 General communication subsystems – Par 1-4: Light source encircled flux measurement method. This document has been selected as pilot document to test the new authoring tool. Current revision plan include suppressing the ultraceable calibration procedure (using micrometre stage), allowing pulsed mode sources, improving the description of the scrambler, and addressing the aspect of traceability.
- IEC 61280-4-1 Cable plant and links – Part 4-1: Multimode fibre optic cable plant attenuation measurement. The CD circulation of the amendment closed with one pertinent editorial comment on BIMMF naming. CDV amendment will move forward to circulation.
- IEC 61280-4-2 Cable plant and links – Part 4-2: Single-mode fibre optic cable plant attenuation measurement. Draft CD is in preparation.
- IEC 61280-4-3 Cable plant and links – Part 4-3: Passive optical networks attenuation measurement. CD is under development and anticipated to be ready for circulation by July 2nd. WG1 is developing a new IS on attenuation measurement of installed PON – estimate of the attenuation using a U band filtered optical time-domain reflectometer (FOTDR) in an upstream direction ,after partial activation of the PON. WG1 will send requests to ITU-T and IEEE requested consideration to specify similar measurements and procedures.

New standards in progress:

- Project 61280-2-xx Digital systems – Part 2-xx: Error vector magnitude. Need to identify a project leader and seek more contributions and add to next meeting agenda.
- IEC 61282-16 Fibre optic communication system design guides - Part-16 Coherent Systems. Draft document is near completion and target to circulate as CD before July 30.

Published documents:

- IEC 61280-2-8, Part 2-8: Determination of low BER using Q-factor measurements

The next meeting of IEC SC86C WG1 will be held
October 8th, 12th and 14th, Virtual meeting.

ITU-T SG15 WP2 meetings: April 26 - May 27, 2021, Virtual meetings

Technologies and Infrastructures for Transport, Access and Home

SG15Q6: Characteristics of optical components, subsystems and systems for optical transport networks

Documents in progress:

- ITU-T Technical Report "Guide on the use of ITU-T L-series Recommendations related to optical technologies for outside plant". Document was modified to take into account the restructuring of SG15 WP2, as well as the new/revised Recommendations consented since February 2020. The technical report was approved for agreement and can be published.
- Draft new Recommendation L.font "Requirements for Fibre Optic Network Terminal Box". Various comments were raised and a new correspondence period was started to resolve the comments.
- Draft new Recommendation L.oehc "Optical/Electrical hybrid cables for access point and other terminal equipment" was reviewed. The detailed hybrid SC connector description and hybrid cable performance requirements is moved to an informative appendix". A liaison statement was sent to IEC SC48B, IEC SC86B and IEC SC86A for comments and recommendations.
- The final draft of the revised ITU-T Recommendation L.201/L.13 "Performance requirements for passive optical nodes: Sealed closures for outdoor environments" was reviewed. A new clause 5.3 for closure materials was added. More detailed tests severities and pass/fail criteria for the UV-light and fungus resistance are added. A humidity resistance requirement is added for the ageing effects by humidity of the polymers used in the closure. For the impact test, a new impact location is described for rectangular shaped closures. After an editing session, the document was approved for consent and would be published soon.
- The draft of the revised ITU-T Recommendation L.400/L.12 "Optical fibre splices" was reviewed. The attenuation characteristics will depend on the used alignment method of the fibers: active core alignment, active cladding alignment and passive V-groove alignment. An appendix is added to show the effects of mode field diameter mismatch and core concentricity when splicing different fibers types. During the discussions no agreement could be found on the optical performance requirements of the fusion splices. A new correspondence activity was started. The document is delayed for consent till December 2021.
- The draft of the revised ITU-T Recommendation L.ncip "Requirements for Passive Optical Nodes: nodes for customer indoor premises" was reviewed. This new recommendation describes the requirements for optical wall outlets in customer premises. Also a small housing that can be used for extension of cables or repair of cables was included.

The next meeting of IITU-T SG15 is scheduled for December, 2021, Geneva, Switzerland.

IEC SC48B meeting: No meetings were held during Q2 2021

- 63171-1 ED2 document was submitted to IEC SC48B committee for publishing as Committee Draft document

The next meeting of IEC SC48B is scheduled for the week of September 12th, Berlin, Germany or Virtual meeting.

IEC SC46 W7 meeting: No meetings during Q2, 2021

The next meeting of IEC JTC1/SC25 is scheduled for September 9, 2021, Virtual meeting.

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