

Issue 33 • Quarter 4, 2021

Standards Quarterly Update:

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

Welcome to the 33rd 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 third 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).

71st ISO/IEC JTC1/ SC25 WG3 meeting: No meetings were held during Q4, 2021

The next scheduled ISO/IEC JTC1/SC25 WG3 meeting will be virtual on February 28, 2022 to March 4, 2022.

TIA TR-42 meeting: October, 2021, Virtual meeting

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

- ANSI/TIA-568.3-E, Optical Fiber Cabling Component Standard
- ANSI/TIA-526-14-D, Revision of ANSI/TIA-526-14-C, Optical Power Loss Measurement of Installed Multimode Fiber Cable Plant
- ANSI/TIA-492000, Adaption of IEC 60793-2:2019, Optical fibres – Part 2: Product specifications – General
- ANSI/TIA-568.7 for balanced single twisted-pair for industrial premises
- ANSI/TIA 5071 draft standard for field testing of single pair cabling systems ANSI/TIA-568.5, single pair cabling and components
- ANSI/TIA-5017, security
- ANSI/TIA-1179-A, revision of 1179, healthcare
- ANSI/TIA-4966, education
- ANSI/TIA-942-B-1, edge data centers

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

- ANSI/TIA-455-3-C (FOTP-3), Procedure to Measure Temperature Cycling Effects on Optical Fiber Units, Optical Cable, and Other Passive Fiber Components
- ANSI/TIA-606-D Administration
- ANSI/TIA-5018, DAS, re-affirmed
- TIA TSB 185, MICE, re-affirmed
- ANSI/TIA-862-C, Building Automation Systems

The following standards were published:

- 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

1. TR-42.1 Commercial Building Cabling

- ANSI/TIA-758-C (OSP) Industry ballot has not been circulated yet – content from ANSI/TIA-590 to be added
- ANSI/TIA-862-C, Building Automation Systems, revision default ballot closed without comment, publication authorized
- ANSI/TIA-942-B-1, edge data centers comments were resolved, default ballot authorized
- ANSI/TIA-4966, education standard comments were resolved, default ballot authorized
- ANSI/TIA-1179-A, revision of 1179, healthcare, committee ballot and revision project authorized
- ANSI/TIA-5017, security, committee ballot and revision project authorized
- ANSI/TIA-5018, DAS, re-affirmed
- TIA TSB 185, MICE, re-affirmed
- ANSI/TIA 4994 and TIA TSB 5046, sustainability, have been rescinded

2. TR-42.3 Pathways and Spaces

- ANSI/TIA-606-D Administration default ballot was reviewed and the document was approved for publication
- ASHRAE 5th edition: 42.3 plans to study its impact on TIA standards

3. TR-42.5 Telecommunications Infrastructure Terms and Symbols

- There were no new proposals for terms, definitions, or acronyms at this meeting

4. TR-42.7 Copper Cabling Systems

- TR42.7 completed comment resolutions for the ballot of ANSI/TIA-568.5, single pair cabling and components standard. A default ballot was authorized.
- TR42.7 resolved comments for the ANSI/TIA 5071 draft standard for field testing of single pair cabling systems and authorized another industry ballot
- A PAR for an addendum to TSB 184-A for power delivery using single-pair was approved

5. TR-42.9 Industrial cabling

- ANSI/TIA-568.7 for balanced single twisted-pair for industrial premises: Comments from a mock ballot were resolved and an industry ballot was authorized

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. Default ballot is in circulation and closes on January 24, 2022.
- 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. Document was published in September 2021.
- 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 ballot review period ended on October 31st.
- ANSI/TIA-568.3-E, Revision of ANSI/TIA-568.3-D, Optical Fiber Cabling Component Standard. 3rd ANSI ballot comment resolution was completed. Draft document with incorporated comment resolutions is approved for industry ballot.

7. TR-42.12 Optical Fibers and Cables

- ANSI/TIA-492000, Adaption of IEC 60793-2:2019. Ballot will go out prior to the January 2022 meeting.
- ANSI/TIA-492AAAF, Adaption of IEC 60793-2-10:2019. Errata (on fiber cross reference naming convention) has be sent to TIA for publication. Users who purchased the recent publication will receive notification and complementary copy of errata.
- ANSI/TIA-492CAAC, Adaption of IEC 60793-2-50:2018. Errata (on fiber cross reference naming convention) has be sent to TIA for publication. Users who purchased the recent publication will receive notification and complementary copy of errata.

- ANSI/TIA-598-E, Revision of ANSI/TIA-598-D, Optical Fiber Cable Color Coding. Subcommittee reviewed recent round robin results of "golden sample" color chips. Additional measurements need to be collected on colors beyond the current 12.
- 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. Document is approved for publication.
- ANSI/TIA-455-111-B (FOTP-111), Adoption of IEC 60793-1-34:2021, Measurement Methods and Test Procedures – Fibre Curl. Project has been approved for adoption.
- TR-42.12 has made the decision to wait until stable IEC documents are available for adoption for the below three documents: IEC 60793-1-22:2001, IEC 61280-1-4:2009, and IEC 60793-1-41:2010.

- The following documents have been recessed/obsolete: FOTP-30, FOTP-54, and FOTP-124.

8. TR-42.13 Passive Optical Devices and Metrology

- The IEC adoption plan was reviewed which includes adoption of IEC optical interfaces (61755 series) and performance standards (61753 series). The list of potential document will be filtered based on stability and appropriateness to TR-42.13 and will be further discussed in the January 2022 meeting

9. TR-42.11 and TR-42.13 Joint Meeting

- VSFF (Very-small Form Factor) connectivity standardization
 - A proposal to specify the VSFF connectors (SAC and MDC) adapter and polarity in TIA-568.3 was reviewed. The group discussed the IEC development status and TIA adoption of these connectors. A Task Group has been formed to further developing the VSFF standardization in TIA (FOCIS documents and in TIA-568.3).
 - Task Group will hold ad hoc meeting(s) prior to the January 2022 meeting to define objectives and course of actions.

The next scheduled TIA TR-42 meeting will be a virtual on January 24-28, 2022.

CLC TC86BXA: Fibre optic interconnect, passive and connectorised components

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

EN 50377-4-3 "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". The document was updated and approved for final voting. This standard is intended to replace CECC 86 265-803 which is no longer available.

EN 50377-15-1 "Type MPO with 12 fibre PPS ferrules terminated on IEC 60793-2 category A1a multimode fibre for 50/125 micron multimode fibre - macrobend enhanced fibre only". The updated document was offered to IEC SC86B WG6 as part of the Dresden agreement. IEC SC86B WG6 adopted the document and has included it in their program of work. TC86BXA will cancel this project due to acceptance of this work by IEC SC86B WG6.

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

- The following documents were updated with the revised comments and 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"
 - EN 50411-3-6: "Multimode mechanical fibre splice"
 - EN 50411-6-1: "Unprotected microduct for categories A and S".
- Document EN 50411-2-4: "Sealed dome fibre splice closures for categories S and A" is approved for publication.

The next scheduled CLC TC86BXA meeting will be held on June 14-16, 2022, Brussels, Belgium.

IEEE 802.3 Ethernet meetings: Plenary meeting—November 8-18, 2021, Virtual meeting Interim meeting—November 22 to December 31, 2021, Virtual meeting

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 May 2022, as IEEE 802 has decided to hold the March 2022 plenary meetings electronically, and IEEE 802.3 has decided to hold the January 2022 interim electronically.

Single-twisted-pair copper standards

1. 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. 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 been exploring proposals for powering a multidrop segment. The issue of defining the electrical loading of a new powered node as well as protocols for managing transients as new nodes are connected are being discussed, but no text has been adopted.
- 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 means that focus has been on the electrical parameters

for the shared-media 'mixing segment' – wiring that connects the various multidrop nodes, and on the interface to the media. While progress has been made, work remains to be done to account for the variability of multidrop connection points and loading on the line. This is necessary to enable less engineered solutions suitable for installation outside of carefully configured equipment interconnects.

- The Task Force adopted a formal timeline resulting in a standard in mid 2023, but it appears that this timeline is in jeopardy.
- #### 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 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 adopted baselines for 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.
 - The project also adopted baseline text for much of the PHY clause, using PAM-4 line coding at about 14 Gbaud and Reed-Solomon FEC and is making refinements of these specifications most notably to improve the FEC performance and the power consumption on links with asymmetric data needs.
 - The project is on track to 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.

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

- This project has adopted corrections to the specifications introduced by IEEE 802.3bu and IEEE 802.3cg. These address several 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 several specifications requiring minor modification.
- As a maintenance project, no new features (e.g., powering levels) may be added.
- The project has achieved conditional approval to enter IEEE-SA ballot at the November plenary and is completing what is expected to be a final Working Group ballot circulation.

4. IEEE P802.3de: IEEE Time Synchronization for Point-to-Point Single Pair Ethernet Task Force

- This project is making minor changes to support TSN with 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.
- The project entered initial working group ballot at the November plenary and is expected to enter IEEE-SA ballot in early 2022. This is expected to be a quick project without any functional changes. The standard is expected to be complete in mid-2022.

5. IEEE 802.3 Greater than 10 Mb/s Long-Reach Single-Pair Ethernet Study Group:

- The Enhancements to point-to-point Single Pair Ethernet Study Group was 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. With the approval of the PAR for 802.3de, the "Enhancements" Study Group has now transitioned to the "Greater than 10 Mb/s" Study Group, focused purely on this long-range work.
- The Greater than 10 Mb/s Long-Reach Single-Pair Ethernet Study Group has reached consensus and agreed on a draft PAR, CSD responses, and objectives for a long-reach 100 Mb/s single-pair Ethernet project, with a 500m reach. This is in-line with one of the operating modes of the 10BASE-T1L PHY specified in IEEE Std 802.3cg. The new 100BASE-T1L project objectives also include line powering and a discussion of a low latency mode.
- While the group also considered including 1 Gb/s long-reach PHYs in the project, the study group has so far been against specifying 1 Gb/s operation. To have distinct identity and be a 'long-reach' project, the general sentiment of the group is for greater than 100m reach, which raises concerns over latency, technical feasibility, and breadth of the target market. It appears unlikely that the project will add 1 Gb/s when it goes for project approval.
- The Study Group will continue to meet, and while it has complete project documentation, the next opportunity for submitting that for IEEE 802 approval is March of 2022.

Optical Fiber Standards

6. 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 3.0 is under Standards Association Review.

7. 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 1.3 is under review by the Task Force.

8. 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 1.2 is under Task Force review.

9. 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 2.0 was reviewed by the Working Group.
- Draft 2.1 is under review by the Working Group.

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

- This Task Force is a result of the Beyond 400G Study Group
- The objectives 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 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
 - 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

The next scheduled interim IEEE 802.3 meeting will be virtual January 10-21, 2022.

The next scheduled OIF Standards meeting will be held in February, 2022, Hybrid meeting, Indian Springs, CA, USA.

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

- IEEE has made changes to the transmit parameters in the 802.3db project, which impacts the FC-PI-8 MMF link specifications. Committee agreed to incorporate these changes into the FC-PI-8 draft document. The changes include RIN12 OMA max, overshoot/undershoot max and transmitter power excursion max specifications.
- Committee continues to evaluate the impact of optical link training. There have been contradicting proposals debating the need of such training. More testing is needed to validate.
- The first ballot is tentatively planned to circulate between February and April of 2022.

The next scheduled INCITS T11 meeting will be virtual/face-to-face on February 8-10, 2022, Raleigh, NC, USA.

The next scheduled IEC SC48B meeting will be virtual/face-to-face hybrid on March 15, 2022, Paris, France.

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

Documents in revision:

- IEC 60793-1-1: Measurement methods and test procedures – General and guidance. Committee Draft (CD) comment resolution completed; document moves to Committee Draft for Vote (CDV) stage.
- IEC 60793-1-44: Measurement methods and test procedures – Cut-off wavelength. CD comment resolution completed; document moves to CDV stage.
- IEC TR 62285: Application guide for non-linear coefficient measuring methods. CD comment resolution completed; document moves to Draft Technical Report (DTR) stage.
- IEC 60793-2-60: Product specifications – Sectional specification for category C single-mode intraconnection fibre. Approved for revision at this meeting.
- IEC 60793-1-40: Measurement methods and test procedures – Attenuation measurement methods. Approved for revision at this meeting.
- IEC 60793-1-41: Measurement methods and test procedures – Bandwidth. Approved for revision at this meeting.
- IEC 60793-1-45: Measurement methods and test procedures – Mode field diameter. Approved for revision at this meeting.

- IEC 60793-2-50: Product specifications – Sectional specification for class B single-mode fibres. Approved for revision at this meeting.
- IEC TR 62284: Effective area measurements of single-mode optical fibres – Guidance. Approved for revision at this meeting.

New standards in progress:

- IEC TR 63309: Active fibres - Characteristics and Measurement Methods – Guidance. 2nd CD is in review stage with closing date of 11-26-2021.

Published documents:

- IEC TR 62000 Ed3: Guidelines for combining different single-mode fibre sub-categories. Document published in 09-2021.
 - Updates fibre naming convention with new names from IEC 60793-2-50 for class B fibres.
 - Modifies various levels of attenuation impact when connecting different fibre types.
- IEC 60793-2-10/AMD1 Ed7: Optical fibres - Product specifications - Sectional specification for category A1 multimode fibres Amendment 1. Document will be published in 12-2021.
 - Modifies zero dispersion wavelength and zero dispersion slope for A1-OM2, A1-OM3, A1-OM4 and A1-OM5.

IEC SC86A/WG3: Fibres and Cables/Cables

Documents in revision:

- IEC 60794-1-1: Optical fibre cables - Generic specification. CD comment resolution completed; document moves to CDV stage.
- IEC 60794-2-10: Indoor optical fibre cables - Family specification for simplex and duplex cables. CD comment resolution completed; document moves to CDV stage.
- IEC 60794-2-20 Approved for revision at this meeting and CD will circulate for review.
- IEC 60794-2-22 Approved for revision at this meeting and CD will circulate for review.
- IEC 60794-2-23 CD comment resolution completed; document moves to 2nd CD stage.
- IEC 60794-2-24 CD comment resolution completed; document moves to 2nd CD stage.
- IEC 60794-2-50 Approved for revision at this meeting and CD will circulate for review.
- IEC 60794-3: Outdoor cables - Sectional specification. CDV comment resolution completed; document moves to FDIS stage.
- IEC 60794-3-40 CDV comment resolution completed; document moves to FDIS stage.

New standards in progress:

- IEC 60794-1-212 Ed1: Environmental test methods – Temperature cycling of cables. Reviewed working draft, document moves to CD stage.
- IEC 60794-1-217 Ed1: Environmental test methods – Cable shrinkage. Reviewed working draft, document moves to CD stage.
- IEC 60794-1-220 Ed1: Environmental test methods – Salt spray corrosion test. Document moves to Final Draft International Standard (FDIS) stage prior to publication stage.
- IEC 60794-1-301 Ed1: Cable test procedures – Bend test, Method G1. CD comment resolution completed; document moves to CDV stage.
- IEC 60794-1-302 (Ribbon dimensions and geometry – visual method). Reviewed working draft, document moves to CD stage.
- IEC 60794-1-303 (Ribbon dimensions – Aperture gauge). Reviewed working draft, document moves to CD stage.
- IEC 60794-1-305 (Ribbon tear (separability). CD comment resolution completed; document moves to CDV stage.
- IEC 60794-1-306 (Ribbon torsion). Reviewed working draft, document moves to CD stage.
- IEC 60794-1-307 (Tube Kinking). CD comment resolution completed; document moves to the 2nd CD stage.

- IEC 60794-1-308 (Ribbon residual twist test). Reviewed working draft, document moves to CD stage.
- IEC 60794-1-309 (Bleeding and evaporation). CD comment resolution completed; document moves to CDV stage.
- IEC 60794-1-310 (Stripping). CD comment resolution completed; document moves to CDV stage.
- IEC 60794-1-311 (Tensile strength and elongation at break of buffer tubes). CD comment resolution completed; document moves to CDV stage.
- IEC 60794-1-312 (Elongation of buffer tubes at low temperature). CD comment resolution completed; document moves to CDV stage.
- IEC 60794-1-404 CDV comment resolution completed; document moves to FDIS stage.
- IEC 60794-2-24: Indoor optical fibre cables – Detailed specification for multiple multi-fibre unit cables for use in MPO connector terminated breakout cable assemblies. CD comment resolution completed; document moves to 2nd CD stage.
- IEC 60794-7 (Fire resistant optical fibre data communication cables). Draft CD will be reviewed at the next meeting.

Published documents:

- IEC 60793-1-34 ED3: Optical fibres - Part 1-34: Measurement methods and test procedures - Fibre curl. Document published in 2021-02.
- IEC 60793-2-40 ED5: Optical fibres - Part 2-40: Product specifications - Sectional specification for category A4 multimode fibres. Document published in 2021-02.
- IEC TR 62959 ED1: Optical fibre cables – Shrinkage effects on cable and cable element end termination. Document published in 2021-02.
- IEC 60793-3-70 ED2: Outdoor cables – Rapid/multiple deployment. Document published in 2021-04.

Documents Withdrawn:

- IEC 60794-2-51
- IEC 60794-3-50
- IEC 60794-3-60

The next scheduled IEC SC86A meeting will be virtual in April-May, 2022.

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. (FDIS)
- IEC 61300-2-1: Vibration (sinusoidal) (CDV)
- IEC 61300-2-2: Mating durability (WD)
- IEC 61300-2-5: Torsion test (CDV)
- IEC 61300-2-6: Strength of coupling mechanism (CDV)
- IEC 61300-2-11: Axial compression (1CD)
- IEC 61300-2-18: Dry heat -High temperature endurance (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 (2CD)
- IEC 61300-2-26: Salt mist (1CD)
- IEC 61300-2-27: Dust (1CD)
- IEC 61300-2-33: Assembly and disassembly of fibre optic mechanical splices, fibre management systems and closures (1CD)
- IEC 61300-2-34: Resistance to solvents and contaminating fluids of interconnecting components and closures (1CD)
- IEC 61300-2-38: Sealing for pressurized fibre optic closures (1CD)
- IEC 61300-2-43: Screen testing of return loss of single-mode PC optical fibre connectors (CDV)
- IEC 61300-2-44: Corrigendum Damp heat, cyclic (COR)
- IEC 61300-3-3: Active monitoring of attenuation and return loss (1CD)
- IEC 61300-3-4: Attenuation (CDV)
- IEC 61300-3-6: Return loss (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 61300-3-33: Withdrawal force from a resilient alignment sleeve using pin gauges (FDIS)
- IEC 61300-3-35: Visual inspection of fibre optic connectors and fibre-stub transceivers. (CDV) The round robin test report TR 63367 (PUB) showed that the automated detection method suffers from repeatability and reproducibility problems. The method C for automated visual inspection will get a requirement that the operator is still allowed to make a judgement. In case of a failure the attenuation and return loss should be measured
- IEC 61300-3-45: Attenuation of random mated multi-fibre connectors (CDV)
- IEC 61300-3-46: MT Ferrule Bore Diameter Measurement (1CD)

Published document :

- IEC 61300-3-7: Wavelength dependence of attenuation and return loss
- IEC 61300-3-53: Encircled angular flux (EAF) measurement method based on two-dimensional far field data from multimode waveguide (including fibre)
- 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), (DTR) 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)
- IEC TR 63367: Summarizing results of end face scratch recognition and verification round robin.

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. (3CD)
- IEC 61753-021-6: Grade B/2 single-mode fibre optic connectors for category OP (3CD)
- IEC 61754-4: Type SC connector family (FDIS)
- IEC 61754-6: Type MU connector family (FDIS)
- IEC 61754-13: Type FC-PC connector (1CD)
- IEC 61754-20: Amendment Type LC connector family (CDV)
- IEC 61755-1: Optical interfaces for single mode non-dispersion shifted fibres - (CDV)
- IEC 61755-2-1: Connection parameters of non-dispersion shifted single-mode physically contacting fibres - non-angled (CDV)
- IEC 61755-2-2: Connection parameters of non-dispersion shifted single-mode physically contacting fibres – angled (CDV)
- IEC 61755-3-1 and -3-2: Optical interface of connectors with full zirconia ferrules. 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 1CD stage, 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.(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 61753-022-7: 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 (CDV)
- IEC 61754-37: Fibre optic connector interfaces- Part 37: Type MDC connector family (CDV)
- IEC 61754-7-4 – Fibre optic connector interfaces – Part 7-4: Type MPO connector family – One fibre row 16 fibres wide (4CD)
- IEC 62005-9-5 for the reliability qualification of sealed closures (NP)
- IEC 63267-1: Optical interfaces for multimode fibres - General and guidance.(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 (1CD)
- IEC TR 63323 Ed1: Fibre optic interconnecting devices and passive components – A study of an SC connector adaptor with safety lock mechanism. (2CD)

Published standards:

- IEC 61753-101-03: Performance standard for fiber management systems for category U – Uncontrolled Environment.
- IEC 61753-111-07: Performance standards for sealed closures for category A – Aerial .
- IEC 61753-111-09: Performance standards for sealed closures for category S – Subterranean
- IEC 61753-131-03: Performance standard for singlemode mechanical splices for category U – Uncontrolled Environment.
- 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.

Withdrawn standards:

- IEC 61753-1-3: General and guidance for single-mode fibre optic connector and cable assembly for industrial environment, Category I. This standard is replaced by IEC 61753-1.

WG7- Standards and specifications for fibre optic passive components

Documents in progress:

- IEC 61753-043-02: Wavelength selective simplex cords with single-mode fibre and cylindrical ferrule connectors for category C. (CDV)
- IEC 61753-051-2: Single mode fibre plug style fixed attenuator (CDV)

- IEC 61753-081-02: Non-connectorized single-mode fibre optic middle-scale 1 x N DWDM devices for category C. (3CD)
- IEC 61753-082-03: Non-connectorized single-mode fibre optic middle-scale 1 x N DWDM devices for category OP. (3CD)
- IEC 61753-082-06: Non-connectorized single-mode fibre optic middle-scale 1 x N DWDM devices for category OP+. (3CD)
- IEC 61753-089-2: Non-connectorized single-mode bidirectional OTDR monitoring WDM devices for category C. (CDV)
- IEC 61753-091-2: Single mode fibre optic pigtailed style circulators for category C (FDIS)
- IEC 62077: Generic specification for circulators. (CDV).

Published standards:

- IEC 61753-071: Non-connectorized single-mode fibre optic 1x2 and 2x2 spatial switches for category C
- IEC 61753-085-2: Non-connectorized single-mode pigtailed CWDM devices for category C.

The next scheduled IEC SC86B meeting will be held May 9-12, 2022, Milan, Italy.

IEC SC86C meeting: October 8-27, 2021, Virtual meeting

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

Documents in revision:

- IEC 61280-1-4: General Communication Subsystems - Light source encircled flux measurement method. CD will be circulated for comments in 12-2021.
 - Improves the calibration procedure and calibration traceability.
 - Improves the fibre shaker description and requirements.
 - Adds pulsed light sources.
 - Removes poorly traceable calibration process using micrometer.
- IEC 61280-4-2: Installed Cable Plant – Single-mode attenuation and return loss measurement. A list of revision objectives was reviewed and agreed objectives will be incorporated into CD for review at the next meeting.
 - Adds equipment cord reference method.
 - Extends measurement uncertainty for longer links (ILs for 10km, 20km, 30km and 40km in IEEE applications) and at 1550nm. Use ITU losses for 1550nm.
 - Includes OTDR measurement uncertainty (reference 61280-4-3), applicable to OTDR bi-directional measurements.
- IEC 61280-4-5 Corrigendum: Installed Cable Plant – Attenuation measurement of MPO terminated fibre optic cabling plant. A request for corrections to the document was brought forth by TIA-TR42.11. WG1 is moving forward with a corrigendum, and the content will be reviewed at the next meeting.

New standards in progress:

- Project 61280-2-xx Digital systems – Error vector magnitude. Project leader has been identified, working draft will be reviewed at the next meeting.
 - Leveraging published TR 61282-10, defines a quantitative metric assessing the quality of optical vector-modulated signals (QPSK or QAM) in Coherent transmission.
- IEC TR 61282-16 Ed1: Fibre optic communication system design guidelines - Coherent Systems. CD comments were resolved, document was approved to the Draft Technical Report (DTR, equivalent to CDV) stage.

- Describes the principle of operation and functional capabilities of coherent optical receivers and optical transmitters used to generate complex vector-modulated signals.
- IEC 61280-4-3 Ed1: Installed Cable Plant – Passive optical networks attenuation and return loss measurements. CD comments were resolved, document was approved to the CDV stage.
 - Adds estimate of the attenuation using a U band filtered optical time-domain reflectometer (FOTDR) in an upstream direction, after partial activation of the PON.

Published documents:

- IEC 61280-1-3 Ed3: General communication subsystems – Measurements of central wavelength, spectral width and additional spectral characteristics.
 - Adds guidelines for optical wavelength meter usage.
 - Improves side-mode suppression ratio (SMSR) and signal-to-source spontaneous emission ratio (SSER) descriptions.
- IEC 61280-4-1/AMD1 Ed3: Installed Cable Plant – Multimode attenuation measurement. Document was approved for publication at this meeting and should be published in the 12-2021 timeframe.
 - Modifies LSPM methods test cords length from “2 m to 5 m” to “2 m to 10 m”.
 - Removes the restriction of A1-OMxb (BIMMF) to be used in LSPM test cords. Amendment 1 permits the use of A1-OMxb fibre in test cords when testing A1-OMxb fibres.
 - Adds test cord details to documentation requirements – the performance grade of test cord connectors and fibre, OMxb (BIMMF) or OMxa (NBIMMF) in test cord, and test cord length.

The next tentatively scheduled IEC SC86C WG1 meeting will be virtual in March, 2022.

1. IEC 61156-15 ED1 - Multicore and symmetrical pair/quad cables for digital communications

Part 15: Symmetrical pair/quad cables for horizontal floor wiring with transmission characteristics up to 1000 MHz and resistance to fire performance characteristics were discussed. Several general, technical, and editorial comments were resolved and are documented in IEC 46C/1195/CC.

- A new CD will be prepared and will be sent with a Liaison Letter to TC20 and JTC1/SC25 for information and comment. longer explicitly requires shielded construction.

The next scheduled IEC TC46 SC46C/WG7 meeting will be held April 25, 2022, Paris, France.

ITU-T SG15 WP2 meetings: December 6-17, 2021, Virtual meeting

SG15Q5: Characteristics and test methods of optical fibres and cables, and installation guidance

- A revision of ITU-T G.650.1 “Definitions and test methods for linear, deterministic attributes of single-mode fibre and cable” was requested to resolve the discrepancy between the measurement method for the mode field diameter between ITU-T G.650.1 and IEC 60793-1-45. A liaison statement from IEC TC86 was received with a proposal. A general guidance on the setup for the far field scanning test method will be added to become harmonized with IEC. A correspondence activity will be started.
- A revision of ITU-T G.654 “Characteristics of a cut-off shifted single-mode optical fibre and cable” was requested to resolve the discrepancy between cable cut-off wavelength and shortest operating wavelength in ITU-T G.698.2 (1528 nm). Also the accuracy and capability of the measurement equipment will be considered.
- Draft new Recommendation L.oehc “Optical/Electrical hybrid cables for access point and other terminal equipment” was reviewed. In a liaison statement IEC TC86 suggested to have a joint collaboration with ITU-T SG15 to start a new work item for the new hybrid connector in IEC SC86B and IEC SC48B. All the detailed connector and cable descriptions are removed from the informative appendix “Chinese experience”.
- As this document is related to L.109 “Construction of optical/metallic hybrid cables” it was decided to start a revision of L.109 to include the cable types described in L.oehc.

SG15Q16: Connectivity, operation and maintenance of optical physical infrastructures

- A new ITU-T Recommendation L.209 “Requirements for Fibre Optic Network Terminal Box (FONT)” was reviewed and approved for consent. The terminal box is intended for FTTH indoor and outdoor applications. Separate compartments for fiber splicing/connectivity and ONU/modem equipment with power supply/battery are foreseen.
- A new ITU-T Recommendation L.316 “Cable identification for the construction and maintenance of optical fibre cable networks with optical sensing technique” was reviewed and approved for consent. This new recommendation describes methods to identify cables by knocking or applying vibration onto the cable without disturbing the traffic in the cable.
- The revised ITU-T Recommendation L.400/L.12 “Optical fibre splices” was discussed and approved for consent. 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.

The next scheduled ITU-T SG15 meeting will be virtual in September, 2022.



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