

Issue 38 • Quarter 1, 2023

# Standards Quarterly Update:

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

Welcome to the 38th 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 first quarter of 2023 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).

**If you have any questions regarding CommScope's involvement in Standards committees or the content below, please email [sunny.xu@commscope.com](mailto:sunny.xu@commscope.com).**

74th ISO/IEC JTC1/SC25 WG3: February 27 – March 3, 2023 - Virtual Meeting

### Working Group 3 Meeting Highlights

The 74th ISO/IEC JTC1/SC25 Working Group 3 (WG3) virtual meeting was attended by 63 experts and observers from 18 countries including Australia, Belgium, Canada, China, Denmark, France, Germany, Great Britain, Ireland, Israel, Japan, Mexico, The Netherlands, Singapore, Spain, Sweden, Switzerland, and the United States.

#### 1. Development of generic single pair cabling specifications

- Comments to the seventh Committee Draft (CD) of the Amendment to ISO/IEC 11801-1 that is primarily aimed at including single pair cabling specifications were resolved and the document was approved to proceed to a CDV (Committee Draft for Vote) for vote.
- The single pair Classes T1-A-100 (20 MHz), T1-B (600 MHz) and T1-C (1,250 GHz) are specified to 100 m. Classes T1-A-250, T1-A-400 and T1-A-1000 (20 MHz) are specified to 250 m, 400 m and 1000 m, respectively.
- The recognized connectors are the IEC 63171-1 copper LC style and the IEC 63171-6 industrial connector.
- The names of the two higher frequency classes were changed back to T1-B and T1-C, mainly because IEC has already published component standards with those names. There is still an intent to provide a class between T1-A and T1-B, with an upper frequency between 20 MHz and 600 MHz, but it has not been named.

#### 2. Single pair cable current carrying capacity

- There were comments again on specifying two classes for different current levels, 2.0 A and 0.75 A, which were rejected. Wording changes to soften the 2 A requirement for 1-pr were also rejected. Nearly all information about 0.75 A on 1-pr was removed from ISO/IEC 11801-1 amd. 1, and is being inserted instead in ISO/IEC TR 11801-9911.

#### 3. Sheath sharing and single pair cabling

- Comments to the second Working Draft (WD) of ISO/IEC TR 11801-9911 were partially resolved. A third WD will be circulated. The scope of this document remains limited to 0.75 A. Guidance to prevent 2 A supplies from being connected to 0.75 A circuits is needed, and is in the early stages of text development. Comment resolution was not finished during the WG3 meeting, but did finish in an ad hoc meeting afterwards. ISO/IEC TR 11801-9911 is not a standard, and it is clear that mixed pair count solutions that support only 0.75 A require an engineered approach.

#### 4. ISO/IEC 11801-6 Amendment 1, to include single pair cabling

- The sixth CD was not circulated before the meeting, so no action took place on this.

#### 5. Single pair multi-drop cabling

- A new project leader was appointed, but this project may be cancelled if there is not enough interest.

#### 6. ISO/IEC 14763-3 Testing of Optical Fiber

- The CDV was still open for voting during this meeting, no further action took place. Comment resolution will be held at the October meeting.

#### 7. Optical trends ad-hoc meeting

- The main topic was surrounding PON deployment. There was general support that PON deployment can be implemented using existing ISO/IEC 11801 cabling, no need to define a PON-only topology.

## 8. Network Physical Security (NPS)

- Comments to the fifth CD of the ISO/IEC 24383 Physical Network Security standard were reviewed and the document will be circulated as a seventh CD. The document covers the security of telecommunications cables, pathways, spaces, and other infrastructure components of the telecommunications physical infrastructure to protect the telecommunications infrastructure from theft, vandalism, intrusions, and unauthorized modifications. The document adds levels of security to cabling, above the installation requirements of ISO/IEC 14763-2.

## 9. Bonding

- The ISO/IEC 30129 standard for bonding is due for review. Comments on the 2nd WD were reviewed. A CD will be circulated.

## 10. Installation

- ISO/IEC 14763-2 for installation is due for review. A WD has been circulated with a comment due date of June 2. It was agreed to keep the chapter for remote powering of 4 pair cabling and develop a similar chapter for 1 pair cabling.

## 11. ISO/IEC 14763-5 Sustainability of Cabling Installations

- The ad hoc resolved comments to the second CD and a third CD will be circulated. There is a CDV target for the next meeting in October. The scope of this document includes requirements and recommendations to maximize the sustainability of cabling systems by addressing the cabling design, selection, packaging and transportation of components and related materials, operation and maintenance of the installation, waste management, and related skillsets for designers, installers and users. The group discussed the most appropriate actions needed when a flood occurs, damage centres in areas with low floor levels, and underground facilities, which will also be discussed further during the next meeting.

The next scheduled ISO/IEC JTC1/SC25 WG3 meeting will be held October 9-12, 2023, with the plenary October 13, in Berlin, Germany, face-to-face only with no remote attendance option.

TIA TR-42: January 30 – February 3, 2023, Tampa, FL, USA

### Copper Activities

- A proposal to move Cat. 5e to an annex in ANSI/TIA-568.2 did not receive much support, 17-4 against.
- TR-42.1 tentatively agreed to publish a TSB with tables of applications supported by copper and fiber cabling classes. A vote is to be taken in June.
- Progress continues on the 1-pr industrial and heating documents, and the revisions of the data center and physical security standards.
- A new scheme for removing heat energy from data centers, liquid immersion cooling, is under study in TR-42.3. This has the potential to be more efficient, but there are issues with fluid materials and handling, and the cabling and active equipment properties needed to withstand immersion.
- The physical security standard covers four different levels of security, elevated from the basic level, with different cost and security level trade-offs. This document covers many areas of data center design.
- There are developments on single-pair multi-drop in TIA, ISO, and IEEE, which will likely lead to multi-device networks connected with a chain of patch cords.

### Fiber Activities

- New proposal to revise Tier 1 vs Tier 2 and LSPM vs OTDR testing requirements for the next revision of ANSI/TIA-568.3. The objective is to harmonize with international SDOs and provide clarification on requirements.

- There is a request to define the dual-LC and dual-MPO belly-to-belly pitch specifications (for the QSFP-DD and OSFP MSAs) to avoid mating issues with adjacent transceivers. A correspondence group is currently reviewing what parameters (min, max or both) and specific value/range should be defined.

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

- ANSI/TIA-1179-A Healthcare
- ANSI/TIA-942-C Data Centers
- ANSI/TIA-758-C Outside Plant
- ANSI/TIA-570-E, Residential cabling
- ANSI/TIA-569-E Pathways and Spaces
- ANSI/TIA-607-E Grounding and Bonding
- ANSI/TIA-568-5-1, addendum to ANSI/TIA-568.5
- TIA TSB-184-A-2, power delivery over single-pair
- TIA-568.2-E, copper cabling systems and components
- ANSI/TIA-568.7 Industrial single-pair
- ANSI/TIA-1005-B Industrial Cabling Systems
- ANSI/TIA-4920000-C, adoption of IEC 60793-2 Optical fibres – Production specifications
- ANSI/TIA-492AAAF-1, Adoption with modification of IEC 60793-2-10 Ed7.1.
- ANSI/TIA-455-3 (FOTP-3) Temperature Ramps and Precision
- 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-568.1-E.1, addendum to add single pair
- ANSI/TIA-4966-A-1, addendum to add single-pair for education
- ANSI/TIA-569-E-1 Updated environmental requirements per ASHRAE updates
- ANSI/TIA-1183-B Balun-less testing
- ANSI/TIA-526-14-D, adoption of IEC 61280-4-1:2021 Installed cabling plant Multimode attenuation measurement.
- 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-568.1-E.1 Addendum for single pair was published.
- ANSI/TIA-4966-A-1 Education addendum for single pair was published.
- Ballot comments for ANSI/TIA-5017-A Security were only partially resolved, resolution was to be completed in an interim meeting.
- Resolved comments and approved a default ballot circulation of ANSI/TIA-1179-A Healthcare.
- Resolved comments on ANSI/TIA-942-C Data Centers. Another ballot was circulated.
- Resolved comments for ANSI/TIA-758-C Outside Plant. Authorized default ballot.
- New project for ANSI/TIA-570-E, Residential cabling, update to ANSI/TIA-570-D, ballot circulated.

## 2. TR-42.3 Pathways and Spaces

- Maintenance of ANSI/TIA-607 Grounding and Bonding ballot was circulated.
- ANSI/TIA-569-E Pathways and Spaces to be discussed next time.

## 3. TR-42.7 Copper Cabling Systems

- ANSI/TIA-1183-B Balun-less measurement methods were published.
- 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 first ballot circulation for ANSI/TIA-568.2-E, revision of ANSI/TIA-568.2-D.

## 4. TR-42.9 Industrial Telecommunications Infrastructure

- In a later interim meeting, resolved comments and authorized another ballot for ANSI/TIA-568.7 Industrial single-pair.
- Resolved comments on ANSI/TIA-1005-B, and authorized default ballot.

## 5. TR-42.11 Optical Fiber Systems

- Tier 1 (OLTS) vs Tier 2 (OTDR) testing requirements
  - Recommended adding the terms RTM (reference test method) and ATM (alternative test method) to align with international SDOs.
  - Majority agrees that LSPM should be the default method for Tier 1 testing as it provides more accuracy. There is a proposal to add OTDR as alternative for Tier 1 testing. Task Group will meet again to further define the LSPM vs OTDR and Tier 1 vs Tier 2 requirements.
- ANSI/TIA-568.3-E Addendum Optical Fiber Cabling and Components
  - Reviewed VSFF Task Group status on polarity of SN/MDC connectivity. Concern was raised that the SN and MDC connectors are not standardized in TIA and should not be specified in TIA-568.3.
  - Further discussions on incorporating the symbols from TSB-5069. Task Group will meet to determine path forward.

## 6. TR-42.12 Optical Fibers and Cables

- Revision of ANSI/TIA-598-D-2014 Optical Fiber Color Coding
  - Ink drawdown 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.
  - An interim meeting was held 3/15/2023 to revise the ink drawdown procedure document.

## 7. TR-42.13 Passive Optical Devices and Metrology

- Guest presentation on co-packing solutions by Ranovus. There is a need for higher-performance and higher-reliability optical connectors to eliminate the need for repair/replacement of connectors during the life span of co-packing equipment.
- Feedback requested from the QSFP-DD and OSFP MSAs on the dual-LC and dual-MPO belly-to-belly pitch specifications. This is important to define in order to avoid mating issues with adjacent transceivers. Individual company's feedback (not official TIA decision) will be shared with the MSAs and discussions will continue whether to define a minimum, a maximum or both and what the specific values or ranges should be.

The next TIA TR-42 meeting will be held from June 5-9, 2023, in Omaha, Nebraska.

CENELEC TC86BXA: No meetings were held during Q1 2023

The next scheduled CLC TC86BXA meeting will be held June 6-7, 2023, Brussels, Belgium.

IEEE 802.3 working group and Task Forces continue to hold interim meetings electronically, while IEEE 802 continued face-to-face plenaries with remote access (a “hybrid” meeting) in March 2023. IEEE 802.3 announced a transition back to in-person interaction, with a hybrid interim meeting May 15-19, 2023 in San Antonio, Texas. 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

- 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 group considered that the revised timeline from July 2022 had been missed, and adopted a further revision in March. The chair advised that if sufficient progress is not made by March he would likely be asking the 802.3 working group to revise, possibly split, the project along functional lines. This could involve terminating or substantially modifying some of the objectives. The main parts of the project, with status and progress, are below.
- Multidrop collision management: 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. This area of the project is largely ready for ballot.
- Multidrop PHY performance extension: The Task Force continues to focus on reusing the already specified active PHY components of the 10BASE-T1S PHY in IEEE Std 802.3cg clause 147. Minor modifications have been proposed but baselines have not been adopted, pending progress on the mixing segment specification.
- Mixing Segment: In the March meeting, the Task Force had some agreement in straw polls that the interface where segments of the device connect to the cabling is not a simple drop from the cabling. Baselines are being developed (but not yet adopted) based on straw polls which indicated that the trunk/device interface might be specified directly, leaving the cabling specified as occupying 4 pins at the interface. Such an interface could go “in” and “out” of a device (connecting left & right sides with cabling segments) or could connect a compensated stub in a similar manner to the mixing segment trunk.
- Powering: The Task Force continues to pursue limited power on the data pair with a control plane for power on an auxiliary pair. However, baselines have yet to be proposed.

#### 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 has largely completed the final stage of balloting after initial SA ballot and SA ballot recirculation. Minimal comments were received on the initial recirculation, and a final recirculation is in progress, expected to complete in early April 2023. The project received conditional approval to submit to the IEEE Standards Board. Even if comments are received on this recirculation, the standard will likely be complete by the June 2023 standards board meeting.
- 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 refined its link segment specifications, supporting 500 meters of single-pair (16 AWG) cabling and up to 5 connectors. The project adopted insertion loss, return loss, and crosstalk (PSANEXT and PSAACR-F) specifications to support 500 meters of cabling, based on models and measurements of 18 AWG cabling with 5 connectors. The baseline calls for the cabling to be specified up to a frequency of 60 MHz and would support shorter reaches on cables with higher loss (e.g., thinner gauge wiring).
- The project is still considering additional time-domain residual echo specifications, based on the specification being refined in 802.3cy. No baseline has been adopted yet. 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. It is likely this will be considered in detail after PHY baselines are selected, possibly in Q3 2023.

- The project continued to hear PHY presentations, and has converged on PAM-based PHYs, either PAM-3, 4, or 5. Discussions are now centering around what level of error correction is needed for the EMC environment. The project is targeting adopting PHY baselines by the July 2023 plenary.

#### 4. IEEE 802.3 Power Delivery Coordinating Committee Ad Hoc

- This ad hoc of the IEEE 802.3 working group is tasked with coordinating 802.3 power delivery specifications with other SDOs, including NFPA, IEC, and ISO/IEC JTC1 SC25 WG3. In the intervening period, the IEEE 802.3 working group has become increasingly concerned with the developments in the ISO/IEC JTC1 SC25 WG3 11801-1 single pair amendments, technical specifications and technical reports to allow cabling with a current capacity of only 0.75 Amperes. This effort appears to be targeted at the reuse of certain 4-pair cabling types, but would severely impair the use of larger gauge single pair cables to deliver power. IEEE 802.3 has taken new steps to submit comments to WG3 and chartered a delegation to work the issue, maintaining a current capacity of 2 Amperes in single pair cabling channels. The comments and presentations from IEEE 802.3 have focused on the possible hazards of the confusion that may result from having some cabling of lower current capacity. The work continues ongoing in ISO/IEC JTC1 SC25 WG3.

### Optical Fiber Standards

#### 5. 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.

#### 6. 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 2.1 was reviewed by the Working Group.

#### 7. 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 3.2 was reviewed by the Standards Association.
- Draft 3.2 was submitted to RevCom and SASB.

#### 8. IEEE P802.3df 400 Gb/s and 800 Gb/s Ethernet Task Force

- This Task Force was 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
- Draft 1.1 was reviewed by the Task Force.
- Draft 2.0 is under review by the Working Group.

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

- This Task Force was split from P802.3df
- 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
  - 400G over 2 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 10 km with a single wavelength (coherent)
  - 800G over 1 pair of SMF up to 10 km with four wavelengths (direct detection)
  - 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.

#### 10. IEEE Greater than 50 Gb/s Bidirectional Optical Access Task Force

- This Study Group will investigate 100G and 400G over 10, 20, and 40 km using bidirectional transmission.
- The objectives for P802.3dk will include
  - 100G and 200G bidirectional over one SMF up to 10 km, 20 km, and 40 km.
- Baseline proposals are being considered.

The next scheduled meeting of IEEE 802.3 will be a hybrid IEEE 802.3 interim meeting May 16-19, 2023 in San Antonio, TX. IEEE 802.3 Task Force electronic Interims are expected to continue telephonically in the meantime, and through July 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. Implementation Agreement for a 3.2Tb/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.
- Project was launched at the February meeting.
- Implementation Agreement is now published.

The next scheduled OIF Standards meeting will be held on May 9-11, 2023 in Budapest, Hungary.

INCITS Fiber Channel T11.2: February 7-9, 2023, Hybrid meeting, Tucson, AZ, USA

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

- Currently in Initial Public Review stage, have received no comments to date. Target publication by mid-2023.

**2. FC-PI-9 (256GFC)**

- FC-PI-9 discussion on requirements
- Many questions surrounding the status and feasibility of 200G VCSEL, and what format for the MMF variant (SR or BiDi) will be. IEEE is currently not developing a SR variant. FC may leverage the

200G-DR1 (500m) variant developing in IEEE and define a SM variant first, and then a MM variant when technology is more stable.

The next scheduled INCITS T11 meeting will be hybrid on June 12-16, 2023, Reno, NV, USA.

IEC SC48B: March 13-15, 2023, Hybrid meeting, Paris, France

- The IEC 63171 ED2 for balanced single-pair data transmission with current-carrying capacity connectors general requirements and tests is at the CD stage with document comments due 2023-02-10. The CD stage committee comments (CC) document is under review by committee with completion date of 2023-07-01.
- The IEC 63171-1 ED2 for balanced single-pair data transmission with current-carrying capacity Type 1 connectors “Copper LC style” is under preparation at the CDV with document comments due 2023-04-07 and closing date of voting period was 2023-04-28.
- The IEC 63171-7 ED1 for balanced single-pair data transmission with current-carrying capacity Type 7 connectors is at the FDIS stage with closing date for voting as 2023-04-28.
- The IEC 60352-6 ED2 for Solderless connections – Part 6: Insulation piercing connections – General requirements, test methods and practical guidance at the Final Draft International Standard (FDIS) with project committee work completed, a type of this insulation piercing (IP) connection commonly used within RJ45 plugs.
- The IEC 60352-2 ED3 for Solderless connections – Part 2: Crimped connections; general requirements, test methods and practical guidance at the CDV stage.
- The IEC 60352-7 ED3 for Solderless connection – Part 7: Spring clamp connections; general requirements, test methods and practical guidance at the CD stage.
- The IEC 60352-9 ED1 for Solderless connection – Part 9: Ultrasonic welding connections; general requirements, test methods and practical guidance at the CDV stage.
- Committee work is ongoing for clarifying contact resistance measuring points and vibration fixturing in several IEC documents for typical connector measurement to help ensure clear measuring points and improvement of figures per standard documents.
- Committee work is ongoing for clarification of insertion speed requirements values in testing with respect to endurance (wear down effect) per base test documents IEC 60512-9-1/3 (Test 9a: Mechanical operation and Test 9c: Mechanical operation (engaging/separation) with electrical load) and respect to mating/unmating forces per base test documents IEC 60512-13-1/2 (Test 13a: Engaging and separating forces and test 13b: Insertion and withdrawal forces).

The next scheduled IEC SC48B meeting will be virtual on TBD, 2023.

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

## IEC SC86B: March 20-24, 2023, Putrajaya, Malaysia

The following revised standards are considered to have an important impact:

- IEC 61300-1/AMD1 Amendment - Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance (CDV). This amendment specifies the minimum length of fiber or cable that has to stay in the climatic test chamber for connectors, pigtails, patch cords, passive optical components, fiber management systems and protective housings when performing environmental tests.
- IEC 61300-2-38: Sealing for pressurized fibre optic closures (FDIS). The title is changed into: " – Sealing for fibre optic sealed closures and hardened connectors using air pressure". The word "pressurized" is removed to avoid a wrong interpretation that this test procedure was only necessary for sealed housings used in pressurized networks. The sealing test method for sealed hardened connectors was added. The addition of figures makes the use of the test method clearer.
- IEC 61753-021-02: Fibre optic connectors terminated on single-mode fibre to category C (FDIS) and IEC 61753-021-06: Grade B/2 single-mode fibre optic connectors for category OP (FDIS). These two updated performance standards -021-02 and -021-06 brought the documents in line with the published IEC 61753-1. The static side load for strain relief test (IEC 61300-2-42) is removed from the document as they are covered by the flexing of strain relief test (IEC 61300-2-44).
- 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 (CDV) and 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 (CDV). The two above mentioned optical interface standards -3-1 and -3-2 introduced the non-tuned or non-oriented variants for the attenuation grades B (0.25 dB) and C (0.5 dB). These variants are compatible with the new tuned or oriented variants with attenuation grades B and C. It must be noted that the new oriented variants for grades B and C have different dimensional requirements on core eccentricity compared to the previous oriented variants. This can result in a non-compliance for the attenuation grade of the new non-oriented variants with the already installed base of the previous tuned variants. In this case it is recommended to remain using the tuned or oriented variants. The new optical interface standards are valid for all fibers with nominal mode field diameter between 8.6  $\mu\text{m}$  and 9.2  $\mu\text{m}$ .

- IEC 63267-2-1: Connector optical interfaces for enhanced macro bend multimode fibres – Part 2-1: Connection parameters of physically contacting 50  $\mu\text{m}$  core diameter fibres – non-angled (CDV)

The following new IEC 63267-series optical interface standards for multimode reference connectors are prepared:

- IEC 63267-2-2: Connector optical interfaces for enhanced macro bend multimode fibre – Part 2-2: Connection parameters of physically contacting 50  $\mu\text{m}$  core diameter fibres - Non-angled and angled for reference connector applications (CDV). This document specifies the geometrical tolerances of the fibre alignment and the tight tolerances of the CD core diameter and NA numerical aperture of the enhanced macrobend multimode reference grade fibre. This document also contains a table with the test limits of the different grades of  $R_m$  reference connectors mated to grade  $B_m$  multimode connectors.
- IEC 63267-3-1: Fibre optic connector optical interfaces for enhanced macrobend multimode fibres – Part 3-1: ( $R_{m1}$ ): Connector parameters of physically contacting 50  $\mu\text{m}$  core diameter fibres – Non-angled 2,5 mm and 1,25 mm diameter cylindrical full zirconia ferrules for reference connection applications (1CD). This document specifies the geometrical tolerances that the terminated 1,25 or 2,5 mm cylindrical ferrule has to meet to be certified as a  $R_{m1}$  reference connector. The document also contains the test limit for reference to reference connector.
- IEC 63267-3-2: Connector optical interfaces for enhanced Macro bend multimode fibre – Part 3-2: ( $R_{m12}$ ): Connector parameters of physically contacting 50  $\mu\text{m}$  core diameter fibres – Non-angled polyphenylene sulphide rectangular ferrules with a single row of 12 or 8 fibres for reference connector applications (1CD). This document specifies the geometrical tolerances that the terminated 12 or 8 fibre rectangular ferrule has to meet to be certified as a  $R_{m12}$  reference connector. The document also contains the test limit for reference to reference connector.

Published standards since previous meeting:

- IEC 61300-2-1: Basic test and measurement procedures - Part 2-1: Tests - Vibration (sinusoidal)
- IEC 61300-2-18: Basic test and measurement procedures - Part 2-18: Tests - Dry heat
- IEC 63267-1: Fibre optic connector optical interfaces - Part 1: Enhanced macro bend loss multimode 50  $\mu\text{m}$  core diameter fibres - General and guidance
- IEC TR 62627-01: Fibre optic connector cleaning methods

The next scheduled IEC SC86B meeting will be held  
November 15 - 24, 2023, Milano, Italy.

The following new IEC 63267-series optical interface standards for multimode connectors terminated to enhanced macrobend multimode fibres are prepared:

## IEC SC86C/WG1: No meetings were held in Q1, 2023

The next scheduled IEC SC86C/WG1 meeting will be held on April 17 & 19, 2023, Virtual meeting

## IEC TC46 SC46C/WG7: No meetings were held in Q1, 2023

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 Q1, 2023

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

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