BUILDING GLOBAL COMMUNICATIONS

TR-42 – Engineering Committee on User Premises Telecommunications Infrastructure

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From: Bob Jensen, Chair TIA TR-42

Subject: Optical Fiber PMD Environmental Considerations in IEEE 802.3ah

In support of the EFM efforts to define the environmental conditions for optical fiber cables, and in the spirit of continued cooperation between TIA TR-42 and IEEE, the following information is provided.

TIA-568B, Commercial Building Telecommunications Cabling Standard, requires outside plant telecommunications cables to comply with the ANSI/ICEA S-87-640 Standard. This Standard, entitled ICEA Standard for Optical Fiber Outside Plant Communications Cable, sets the environmental and mechanical testing levels and expected performance for cables intended for use outdoors. The normal operating temperature ranges for cables covered by this Standard are -40 °C to 70 °C (-40 °F to 158 °F). For single-mode fibers, the increase in attenuation shall be ≤ 0.15 dB/km at 1550 nm. For multimode fibers, the increase in attenuation shall be ≤ 0.30 dB/km at 1300 nm. Please consult the Standard for the details in the temperature cycling test.

TIA-568B also requires the optical fiber connectivity to meet the mechanical and environmental performance listed in Annex A to TIA-568-B.3. In summary, low temperature testing is performed at 0° C with a maximum attenuation delta of 0.3 dB and high temperature testing is conducted at 60° C.

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Similarly, TIA-758, *Customer-owned Outside Plant Telecommunications Cabling Standard*, requires that optical fiber cable performance comply with the requirements of ICEA S-83-640 and TIA-568. Optical fiber connectors and patch cords must also meet the requirements of TIA-568. There is an additional requirement to comply with Telcordia GR-326 if installed in environmentally uncontrolled locations. The Telcordia document provides specific environmental and mechanical performance for optical fiber connectors.

Best regards,

Bob Jensen
Chair TR 42