Proposer's note: If the use of test fiber as a chromatic dispersion element and the corresponding bandwidth adjustment of the reference receiver / filter combinations are not adopted normatively in clause 86.7.5.4 for the TDP test fixture, then the proposed content of the new informative annex for extended-reach testing follows.

Annex 86A

(informative)

Transmitter and dispersion penalty (TDP) test for extended-reach capability

86A.1 Introduction

40GBASE-SR4 and 100GBASE-SR10 transmitters may be capable of supporting transmission to lengths longer than those established in clause 86. This annex describes an adjustment to the TDP test fixture for screening transmitters that have extended-reach capability. If transmitters compliant to clause 86 requirements pass the TDP test under the more stressful conditions imposed by this longer-length channel adjustment, then these transmitters can support transmission over such channels, provided the maximum channel insertion loss of 86.10.1 is not exceeded.

86A.2 TDP test fixture adjustment

The adjustment inserts a higher level of impairment into the test channel in the form of an additional length of the test fiber defined in 86A.4 that acts as a chromatic dispersion element within the TDP test fixture. The 6.25 GHz bandwidth of the reference receiver / filter combination defined in clause 86.7.5.4 corresponds to 100 m of OM3 cabled optical fiber. This bandwidth also corresponds to 250 m of OM4[1] cabled optical fiber when operating at a worst-case wavelength of 840 nm and when the chromatic dispersion impairment is represented by a test fiber rather than as a component of the reference receiver / filter combination.

Place a length of the test fiber with the properties given in Table 86A-1 into the test fixture. No other fixture adjustment is needed. This length of the test fiber in the TDP test fixture introduces the appropriate adjustment that permits the fixture to screen transmitters capable of supporting transmission over at least 250 m of OM4 cabled optical fiber.

86A.3 Other parametric adjustments

No parametric adjustments are required to the PMD specifications. Of specific relevance, the maximum TDP value and the minimum OMA value of Table 86-8 remain unchanged. The fiber optic cabling (channel) characteristics defined in Table 86-18 remain unchanged except the maximum operating distance is increased to 250 m. The optical fiber and cable characteristics defined in Table 86-19 remain unchanged except the minimum effective modal bandwidth is raised to 4700 MHz•km corresponding to OM4 fiber.

86A.4 Channel requirements

The transmitter is tested using an optical channel that meets the requirements of Table 86A-1. The channel is realised with a fiber of length chosen to meet the dispersion requirement.

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[1] Specified in draft TIA 492-AAAD as OM4 and draft IEC 60793-2-10 edition 4 as Type A1a.3

To verify that the fiber has the correct amount of dispersion, the measurement method defined in IEC 60793-1-42 may be used. The measurement is made in the linear power regime of the fiber.

Table 86A-1 – Transmitter compliance channel specifications

PMD type	Dispersion[a] at 840 nm (max)	Effective modal bandwidth[b] at 850 nm (min)	Insertion loss[c]	Optical return loss[d] (max)
40GBASE-SR4	-27.0 ps/nm	10,000 MHz·km	Minimum	12 dB
100GBASE-SR10				

[a] The dispersion is calculated for the distance at the upper extreme of the operating range.
[b] Fiber meeting the requirements of 86.10.2 with differential mode delay ≤ 0.066 ps/m from R_{INNER} = 0 μm to R_{OUTER} = 23 μm measured per IEC 60793-1-49.
[c] There is no intent to stress the sensitivity of the BERT's optical receiver.
[d] The optical return loss is applied at TP2.