

Insertion Loss Measurement Procedure

MPO Connector, One Cord OS1 SMF – Permanent Link

ISO-IEC 14763-3:2006-Amd 1:2009

One or three cord referencing methodology is mandated. The default referencing methodology is the three cord method.

In this document we cover the alternate one cord method.

The basic principles are presented.

- Testing is performed one fibre at a time using a Kingfisher International optical power meter with Large Area Detector and two launch cords.
 - The use of verified reference grade test cords is mandatory.
 - For clarity, air filters and the necessary presence of pinned and non-pinned connectors are not shown.
 - To achieve consistent results, clean all connectors, through-connects and adapters associated with the test prior to and during measurement.
 - Ensure the source has warmed up before commencing measurement.
1. Connect 'the breakout launch cord to the single fibred' launch cord and power meter. Set the reference.

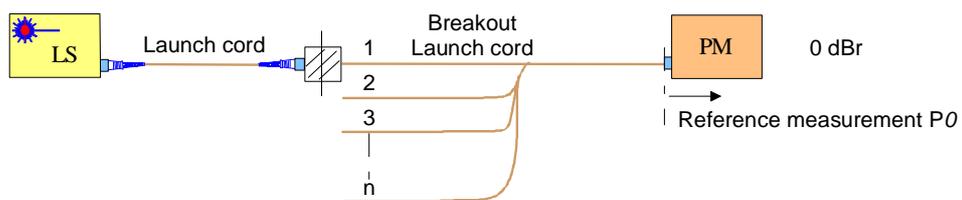


Figure 1, One cord reference

2. Disconnect breakout launch cord from meter. Connect breakout launch cord to one end of the cabling under test (CUT/DUT). Connect MPO tail cord (TC) to other end of the DUT.

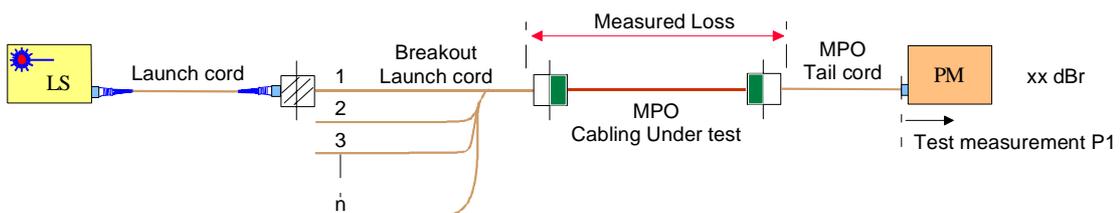


Figure 2, One cord measure, fibre 1

3. Read the insertion loss directly in dBr.
4. Maintaining cleanliness, move launch cord through fibres 2 to n and measure IL. Do not disconnect the MPO TC.

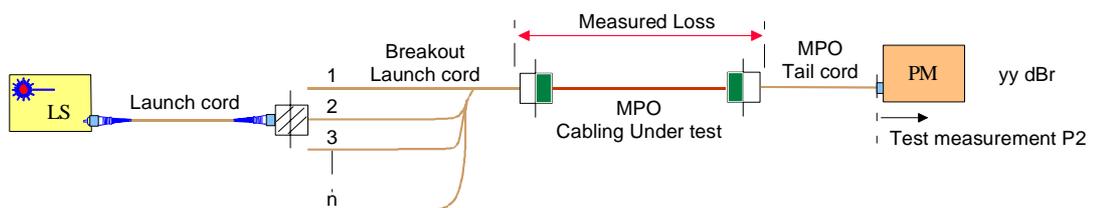


Figure 3, One cord measure, fibres 2 ~ n

Air Coil

Air coils should be placed towards the source end of the launch cord.

Minimum of 2 single air-coiled turns or mandrel wraps of 35 ~ 50 mm / 1.4 ~ 2 inch diameter.

Table 1, Air Coil specification - IEC-61300-3-4

ISO-IEC 14763-3 / 11801

For OS1 SMF fibre installations tested in accordance with ISO/IEC specifications, the following maximum limits apply to the various cable plant components.

| Item | Specification |
|----------------|---------------|
| Connector loss | 0.75 dB |
| Splice loss | 0.3 dB |
| 1310 nm | 1.0 dB/km |
| 1550 nm | 1.0 dB/km |

Table 2, ISO-IEC OS1 cable plant specification

Pass / Fail formula

The international pass-fail standard uses a complex formula which is designed to allow for the differing insertion losses between a Reference-DUT connection and a DUT-DUT connection.

Further complexity is added by mandating a different referencing methodology for a Channel to that of a Permanent Link.

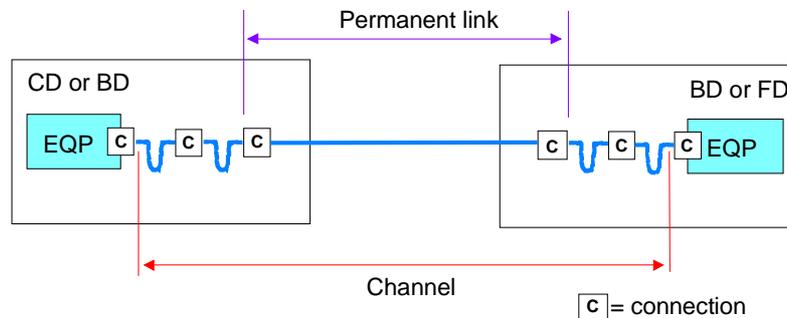


Figure 4, Link - channel definition

One cord reference formula

$$\text{Maximum IL at 1310 / 1550 nm} = 1.0 + 1.0L + 0.3N + 0.75(C-2)$$

Where:-

L = Cable length in Km,

N = number of splices and

C = number of connectors.

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