

Insertion Loss Measurement Procedure

MPO Connector, Three Cord Reference, MMF Channel

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 three cord method.

- Testing is performed one fibre at a time using a Kingfisher International optical power meter with Large Area Detector.
- The use of verified reference grade test cords is mandatory.
- For clarity, the presence of a mandrel is not shown.
- To achieve consistent results, clean all connectors, through-connects and adaptors associated with the test prior to and during measurement.
- Ensure the source has warmed up before commencing measurement.

1. Connect the 'single fibred launch cord & breakout launch cord', substitution cord and the tail cord to the wide area detector power meter. Set the reference.

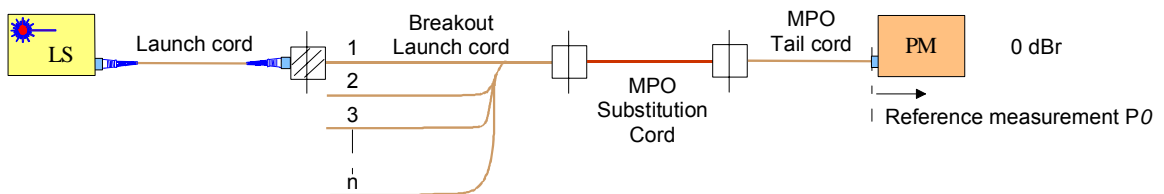


Figure 1, Three cord reference

2. Disconnect substitution cord. Connect breakout launch cord and MPO tail cord to the cabling under test (CUT/DUT).

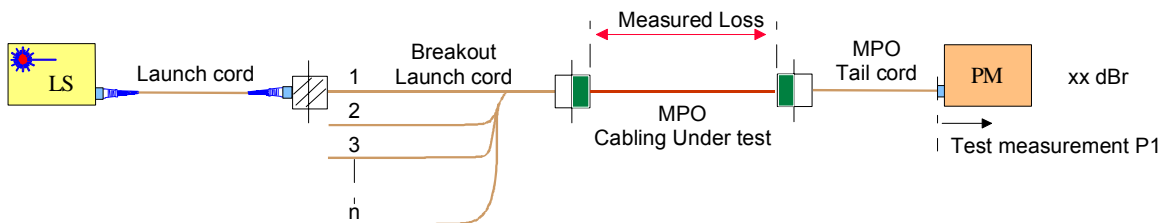


Figure 2, Three cord measure, fibre 1

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 tail cord.

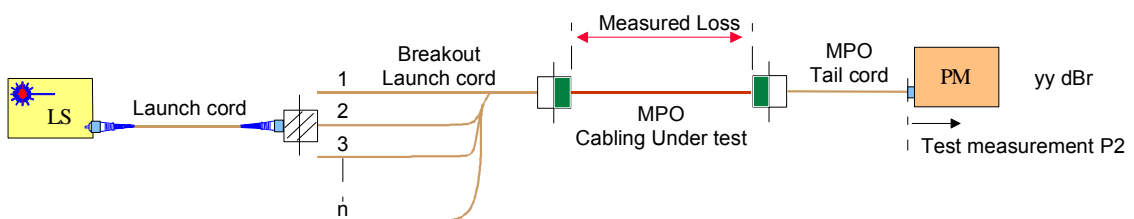


Figure 3, Three cord measure, fibres 2 ~ n

Mandrel coil specifications

The mandrel should be placed towards the source end of the launch cord.

Fibre cladding	3 mm jacketed mm /(inch)
50 μm	18 (0.7)
62.5 μm	20 (0.8)

Table 1, Mandrel diameters - IEC 61300-3-4

ISO-IEC 14763-3 / 11801

For 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
850 nm	3.5 dB/km
1300 nm	1.5 dB/km

Table 2, ISO-IEC 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.

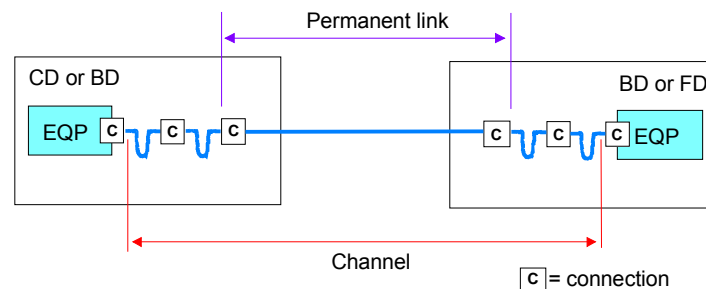


Figure 4, Link - channel definition

Three cord reference formulae

$$\text{Maximum IL at 850 nm} = 0.4 + 3.5L + 0.3N + 0.75C$$

$$\text{Maximum IL at 1300 nm} = 0.4 + 1.5L + 0.3N + 0.75C$$

Where:-

L = Cable length in km,

N = number of splices and

C = number of connectors.

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