

## Insertion Loss Measurement Procedure

### MPO Connector, Three Cord Reference, OS1 SMF Channel

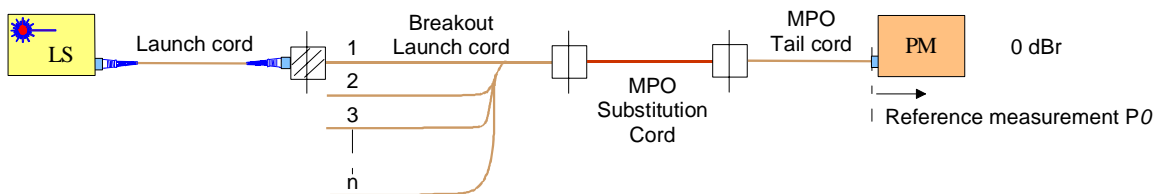
#### ISO-IEC 14763-3:2006-Amd 1:2009

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.

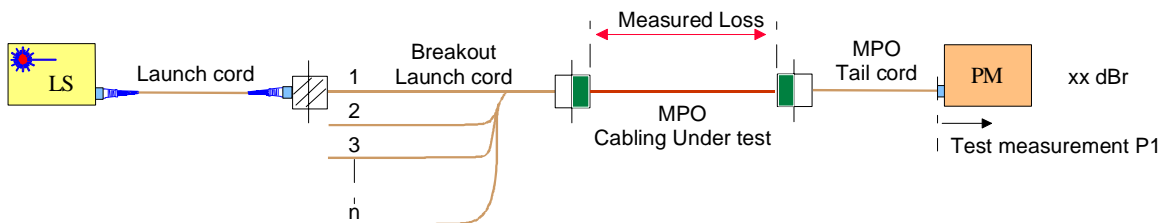
- Testing is performed one fibre at a time using a Kingfisher International optical power meter with Large Area Detector.
- The use of verified reference grade test cords is mandatory.
- For clarity, the presence of an air-coil or mandrel is not shown.
- To achieve consistent results, clean all connectors, 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.



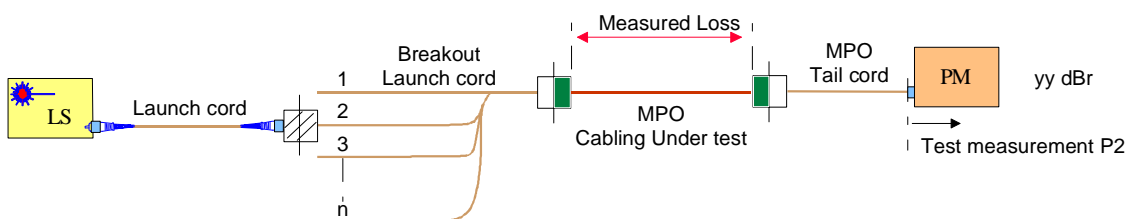
**Figure 1, Three cord reference**

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**

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

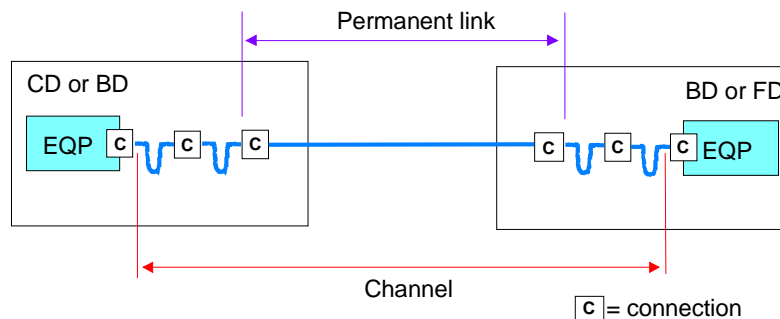
Item	Specification
Connector loss	0.75 dB
Splice loss	0.3 dB
1310 nm	1.0 dB/km
1550 nm	1.0 dB/km

**Table 2, ISO-IEC 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 formula

$$\text{Maximum IL at 1310 / 1550 nm} = 0.6 + 1.0L + 0.3N + 0.75C$$

Where:-

- L = Cable length in km,
- N = number of splices and
- C = number of connectors.

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