Insertion Loss Measurement Procedure
2-way tester -Three 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.

<u>In this document we cover the three cord method.</u>

To achieve consistent results, clean and inspect all connectors, through-connects and adapters associated with the test prior to and during measurement.

Ensure all SMF test cords meet IL specification of ≤ 0.2 dB.

Ensure the source has warmed up before commencing measurements.

1. Fit correctly sized air coils to instrument ends of launch and tail cords.

> 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

2. Connect launch cord, substitution cord and tail cord to the 2-way Loss test Sets (LTS) and set the reference. For clarity, the air coils are not shown.
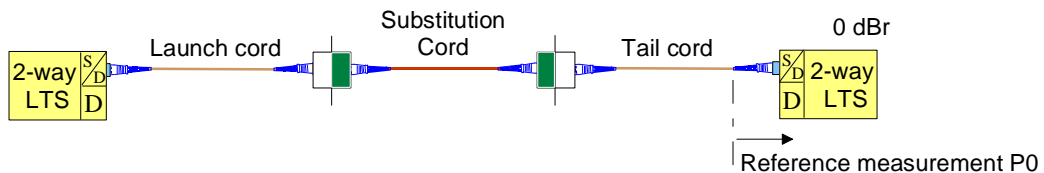

Figure 1, Three cord reference

3. Disconnect substitution cord. Connect launch cord to one end of the cabling under test (CUT/DUT). Connect tail cord to other end of the DUT.
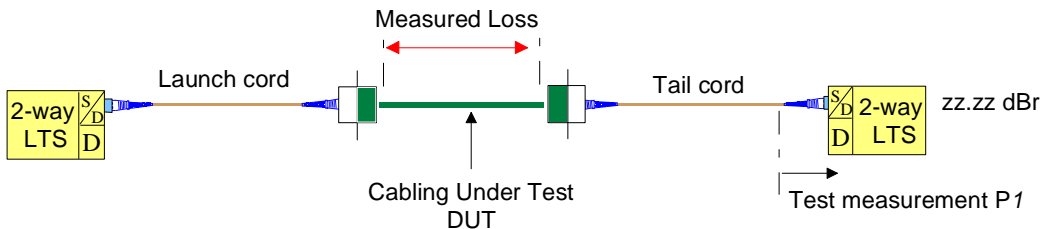

Figure 2, Three cord measure

4. Read the insertion loss directly in dBr.

5. Standard based pass/ fail calculations as detailed over the page can be applied to the result.

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.
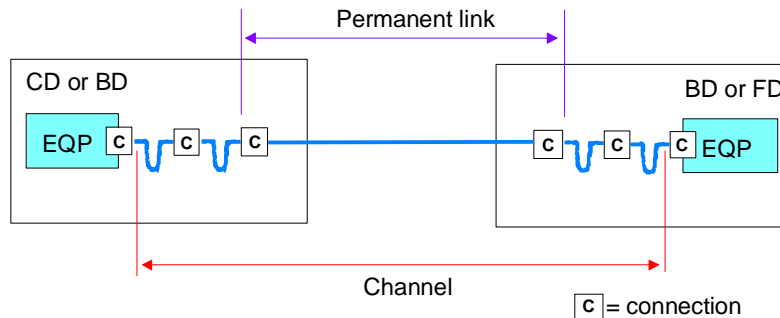

Figure 3, Link - channel definition

Three cord reference formula

Maximum IL at 1310 / 1550 nm = $0.6 + 1.0L + 0.3N + 0.75(C-2)$

Where:-

L = Cable length in Km,

N = number of splices and

C = number of connectors.