

## Insertion Loss Measurement Procedure 2-way tester Three Cord, MMF 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 three cord method.

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

Ensure all MMF test cords meet IL specification of  $\leq 0.1$  dB.

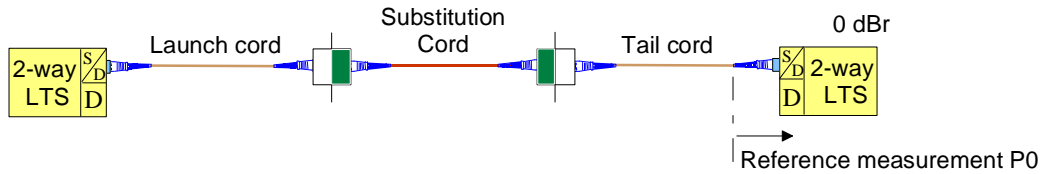
Ensure the source has warmed up before commencing measurements.

1. Fit correctly sized mandrel to instrument end of launch and tail cords.

Fibre cladding	3 mm jacketed mm /(inch)
<b>Fibre core</b>	
50 $\mu$ m	18 (0.7)
62.5 $\mu$ m	20 (0.8)

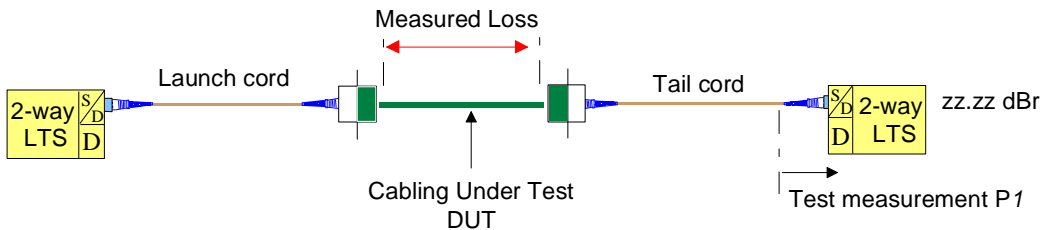
**Table 1, Mandrel diameters - IEC 61300-3-4**

2. Connect launch cord, substitution cord and tail cord to the 2-way Loss Test Sets (LTS) and set the reference. For clarity the mandrels 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 installations tested in accordance with ISO/IEC specifications, the following maximum limits apply to the various cable plant components.

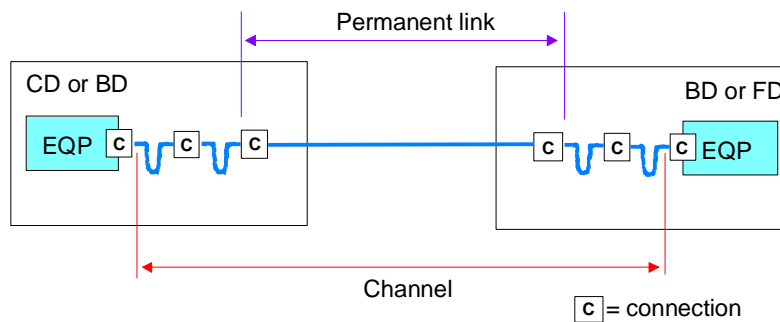
Item	Specification
Connector loss	0.75 dB
Splice loss	0.3 dB
850 nm	3.5 dB/km
1300 nm	1.5 dB/km

**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 3, Link - channel definition**

### Three cord

$$\text{Maximum IL at 850 nm} = 0.4 + 3.5L + 0.3N + 0.75(C-2)$$

$$\text{Maximum IL at 1300 nm} = 0.4 + 1.5L + 0.3N + 0.75(C-2)$$

Where:-

L = Cable length in km,

N = number of splices and

C = number of connectors.

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