

# 101 Series: What's Different About TRCs and How Do I Choose One?

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While it may look and feel like a fiber patch cord, Test Reference Cords, or TRCs for short, are not patch cords. There's a little something different about these cords that are used for certifying fiber cabling systems to ANSI/TIA, ISO/IEC and IEEE standards.



As part of our Cable Testing 101 Series, let's take a closer look at what's different, why we need them, and how to choose one.

## What's Different?

TRCs are constructed of reference grade cable and terminated with reference grade connectors.

Reference grade cable features much tighter tolerances with a consistent core diameter and core/cladding concentricity (i.e., roundness) throughout the cable. Reference grade connectors also have much tighter tolerances than standard connectors – multimode reference connectors should have a mated loss of  $\leq 0.10$  dB and singlemode reference grade connectors should have a mated loss of  $\leq 0.20$  dB.



In contrast, a regular standard patch cord may have variances in core diameter and cable geometry with a typical connector loss that varies between 0.20 and 0.5 dB for multimode and between 0.3 and 1.0 dB for singlemode.

The performance of reference grade connectors is defined by ANSI/TIA-526-14-C and IEC 61280-4-2 industry standards, and the latest revision of the ANSI/TIA-568.3-D standard calls for even tighter test limits when mating reference-grade connectors to standard-grade connectors.

## Why Do I Need Them?

When it comes to testing fiber systems, it's important to understand that connector loss refers to the loss of a mated pair of connectors – it's actually impossible to measure a single connector. So to test the loss of the first connector, it must be mated to a similar, known quality connector. The reference-grade connector of the TRC won't adversely impact the measurement -- regardless of the connector it's mated to.

For example, let's assume you are installing low loss LC connectors that have a typical loss of about 0.15 dB. If you were to test this connector by mating it to a connector that has a loss of greater than 0.15, you'll end up with a pessimistic result. More importantly, if the connector you're using to test has high loss, you could end up over your loss budget and fail what is actually a perfectly good link.

TRCs also are needed to measure the output power of your tester so they can be calibrated to 0 dB of loss. This is done by setting a reference with the TRC connected to the tester to take into account the loss of the TRC. You can think of this as placing a bowl on a scale and then calibrating the scale to zero to achieve an accurate weight reading for whatever you place in the bowl.

