

Product Focus



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Testing Proves Most Cords Fail TIA Requirements Buyers are not getting what they paid for

Reasons for Test Program

Most people associated with the LAN premise equipment market are aware that patch cords matter, especially if their networks are running 100Base-T or higher speed protocols. At faster data rates, cords have a huge impact on LAN performance, error rates, and channel throughput. As evidence, the TIA advises that if you have a LAN problem, the first thing you should do is change your patch cords. Until recently, cords could not be easily tested, so most users simply believe what is printed on the cord's cable jacket or package and purchase cords based on lowest price.

Mid 2002, the TIA issued the industry's first patch cord test procedure (TIA/EIA-568-B.2-1, Annex J). This test procedure requires a network analyzer, complex fixturing, and highly trained personnel. It is not intended for use in the field or a production environment. Most patch cord assembly houses could not afford the equipment or personnel to do proper testing, and they realized their customers could not test cords either. Therefore, they could claim anything.

Early in 2003, Fluke Networks introduced patch cord test capability that simply and efficiently tested cords to the full requirements of TIA/EIA-568-B; including propagation delay, length, delay skew, NEXT, wire map, and return loss. When Quabbin Wire realized the impact this new testing capability would have on the patch cord market, they instituted this test program.

Cord Sampling

Ninety-six Category 5e and fifty-three Category 6 rated cords were tested. They were purchased on the open-market; however, no premise OEM system-proprietary

cords were included due to concerns about cord and channel interoperability.

They were purchased from distributors, retail outlets, assemblers, and catalog houses; obtaining three or four samples of each category in 2-meter and 3-meter lengths (See Table 1). Suppliers were well distributed across the USA.

Each cord was specifically identified as to vendor, bulk cable manufacturer, sales channel, and performance category. The purchase price of a 2-meter cord was also recorded to correlate performance to cost.

Summary

The test results detailed on the reverse show that 70% of Cat 5e and 83% of Cat 6 cords failed. It is clear that cord buyers must begin to demand actual performance data from suppliers.



New cord adaptor performs TIA cord tests.

TABLE 1

Purchase Channel (Number)	Cat 5e Cords (Number)	Cat 6 Cords (Number)
Distributors (20)	63	20
Retail Outlets (4)	13	9
Assembly Houses (7)	10	22
Catalog Houses (3)	10	2

A total of 149 cords were purchased from 34 different vendors throughout North America. Table 1 shows the number and category obtained from each purchase channel.

Test Results and Conclusions

Category 5e cord testing results were very surprising. Since most systems sold today are Cat 5e, one would think that few cords would fail; however, the testing revealed a **69.8%** failure rate. Because Category 6 cord requirements are new and much more severe, higher failure rates could be anticipated. We were not disappointed. The data showed **83%** of Cat 6 cords tested did not meet the TIA requirements. These failure rates were roughly equivalent across all purchase channels. Statistical calculation, based on the assumption of an infinite number of cords available, finds that this data is accurate within 10% with a 90% confidence factor.

Category 6 failures were predominately huge NEXT issues; however, many failed both NEXT and RL. No Cat 6 cords failed RL alone. Failed Category 5e cords had smaller failure margins, with NEXT and RL problems more evenly distributed. Many failing cords exhibited damaged or deformed cable, inconsistent assembly techniques, and too tightly coiled packaging. It was apparent that most cord assemblers do not have the proper manufacturing processes or testing capability to consistently produce compliant Cat 5e or Cat 6 cords.

There was minimal cost to performance correlation. For example, the cost of a 2-meter Cat 6 cord had a variation from about \$1.00 from one assembler to

almost \$20.00 at a retail outlet, and both cords failed. In fact, many of the most expensive Category 6 cords did not even meet Category 5e limits.

One Cat 5e assembler had 100% passing samples. They use high quality bulk cable and plugs, combined with good handling, assembly, and packaging techniques. Another assembler uses similar techniques to produce Category 6 cords. Although they currently do not test their cords, they had only 25% failure rate. You can, therefore, conclude that it is possible to produce high volume, fully compliant Category 5e and 6 patch cords **if you combine the proper cable, plugs, assembly methods, and test gear.**

Although most open-market Category 5e and 6 cords failed the TIA's published requirements, there is now available a simple, accurate, and cost effective cord test capability. This tool is making the patch cord market honest, creating a win-win situation for the entire marketplace.

Responding to the market, Quabbin has trained Assembler Partners to produce cords that are both Category 6 channel interoperable and backward compatible with older legacy networks. Best of all, every cord is backed by actual test data, assuring the buyer and end user they are getting the performance they paid for and have the right to expect.



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