

LC Multimode Fiber Optic Connectors Terminated To 1.8 mm Simplex Cable With 62.5/125 μ m Fiber (8 Mated Pairs)

1. INTRODUCTION

1.1. Purpose

Testing was performed on LC multimode fiber optic connectors terminated to 1.8 mm simplex cable with 62.5/125 μ m fiber to determine their conformance to the requirements stated in this document.

1.2. Scope

This report covers the optical and mechanical performance of cable assemblies, which consist of LC multimode connectors with 1.8 mm simplex cable and 62.5/125 μ m fiber, manufactured by the Communications and Industrial Solutions Manufacturing Unit of Tyco Electronics. Testing was performed between 08Dec09 and 09Dec09.

1.3. Conclusion

LC simplex fiber optic cable assemblies, listed in section 1.5, meet the optical and mechanical performance requirements stated in this document.

1.4. Product Description

Tyco Electronics LC multimode fiber optic connectors and cable assemblies are used in telephone company central offices, CATV headends, interbuilding backbones and customer premise applications. In particular, the small form factor of the LC connector is ideal for applications that require high-density utilization of space.

1.5. Test Samples

Samples were constructed using normal manufacturing means. Multimode 62.5/125 μ m optical fiber was used in the following tests. The following sample quantities were used for the test group.

| | |
|------------------------|----------------------------|
| Test Group | 1 |
| Connector Type | Simplex LC Multimode |
| Connector Part Number | 1918267-1 |
| Fiber Type | Multimode 62.5/125 μ m |
| Cable Type | 1.8 mm Simplex MIL.TACT. |
| Cable PN | 6828453-1 |
| LC Duplex Clip | 1754371-1 |
| Coupling Receptacle PN | 1985150-3 |
| Test Cable Length (m) | 3.2 m |
| Test Samples Required | 8 mated pairs (see Note) |
| Source Wavelength | 850 and 1300 nm |

NOTE

A mated pair consists of 2 LC-to-LC Simplex cable assemblies coupled together using an LC Duplex clip.

1.6. Design Verification Test Sequence

| Test or Examination | Test Sequence |
|--------------------------------|---------------|
| Examination of Product | 1 |
| Initial Optical Performance | 2 |
| Cable Retention, 0 Degree Pull | 3 |

NOTE Numbers indicate sequence in which tests are performed.

2. SUMMARY OF TESTING

2.1. Examination of Product

Tyco Electronics Communications and Industrial Solutions Manufacturing Unit, using normal manufacturing processes, built all samples submitted for testing. The samples were inspected for conformance to the applicable production drawings.

2.2. Initial Optical Performance

All measurements met the stated performance goal. The maximum permitted loss is 0.75 dB. The minimum permitted return loss is 20 dB. Attenuation and return loss were measured at 850 and 1300 nm. The test results are tabularized below.

| Test Group (N = 16) | Initial Attenuation (dB) | | | Initial Return Loss (dB) | | |
|------------------------|--------------------------|---------|---------|--------------------------|---------|---------|
| | Average | Minimum | Maximum | Average | Minimum | Maximum |
| 850 nm | 0.04 | 0.02 | 0.11 | 30.27 | 29.40 | 31.00 |
| 1300 nm | 0.03 | 0.01 | 0.08 | 32.34 | 31.40 | 33.00 |

2.3. Cable Retention, 0 Degree Pull

All measurements met the stated performance goal. For the initial and final measurements, the maximum permitted loss is 0.75 dB. The minimum permitted return loss is 20 dB. Attenuation and return loss were measured at 850 and 1300 nm. The test results are tabularized below with graphs located in the Appendix.

| Test Group (N = 16) | Attenuation After Test (dB) | | | Return Loss After Test (dB) | | |
|------------------------|-----------------------------|---------|---------|-----------------------------|---------|---------|
| | Average | Minimum | Maximum | Average | Minimum | Maximum |
| 850 nm | 0.04 | 0.01 | 0.10 | 30.24 | 29.50 | 30.90 |
| 1300 nm | 0.03 | 0.00 | 0.09 | 32.29 | 31.20 | 32.90 |

| Test Group (N = 16) | Change In Attenuation Before/After Test (dB) | |
|------------------------|---|---------|
| | Average | Maximum |
| 850 nm | 0.00 | 0.01 |
| 1300 nm | 0.00 | 0.01 |

3. TEST METHODS

All optical measurements were performed with the utilization of a multimode test system. This measurement facility is compliant with ANSI/TIA-568-C.3, Annex A. Loss and reflectance is measured at 850 and 1300 nm. Following the installation of the samples, sequential testing was performed. Changes in transmission were calculated from the difference between initial optical power at the start of the test and final optical power at a specified point later in the test. A negative change in transmission value indicates a decrease in optical power.

3.1. Examination of Product

Product drawings and quality inspection plans were used to examine the samples. They were examined visually and functionally.

3.2. Initial Optical Performance

Initial optical power, through the selected launch connector fiber, was measured. The connector assembly was then mated and final optical power measured from the receive-side cable assembly. Cable assembly attenuation was calculated by taking the difference between the initial measurement and the final measurement. Return loss was performed using optical reflectance discrimination methodology.

3.3. Cable Retention, 0 Degree Pull

Using a 7.6 cm [3 in] mandrel, the receive sides of the mated pairs were wrapped 22 to 28 cm [10 in] behind the strain relief. With a load application rate of 5 N [1.12 lbf] per second, the mated pairs were subjected to a 66.72 N [15 lbf] axial load for a minimum of 5 seconds. Attenuation and return loss were measured before and after the load application.

APPENDIX









