
Adhesive for Single Fiber Field Terminations

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for single fiber field terminations terminated with 900 micron, PVC buffered fiber and a field-use adhesive.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 2 shall be used. All inspections shall be performed using the applicable inspection plan(s) and product drawing(s).

1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed on 15Mar04. The Qualification Test Report number for this testing is 501-579. This documentation is on file at and available from Engineering Practices and Standards (EPS).

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between requirements of this specification and referenced documents, this specification shall take precedence.

2.1. Tyco Electronics Documents

- 102-952: Quality Specification
- 408-4159: Multimode (MM) SC Connector Kits
- 408-4208: Singlemode (SM) SC Connector Kits
- 408-4211: Multimode SC Duplex Connector Kits
- 408-4212: Duplex Singlemode SC Connector Kits
- 408-8675: LC Connector Kits
- 501-579: Qualification Test Report

2.2. Commercial Standard (Reference)

- TIA/EIA-455-B: Standard Test Procedures for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices and Other Fiber Optic Components
- TIA/EIA-568-B.3: Optical Fiber Cabling Components Standard

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design and construction specified in the applicable instruction sheet(s) listed in section 2.1 for the following connector kits, cable and adhesive:

- LC MM Simplex Kit 1588706-1, adapter 1457567-5, fiber 599204-6, adhesive & primer,* 8-10m long.
- LC SM Simplex Kit 1588710-1, adapter 1457567-4, fiber 599208-9, adhesive & primer,* 8-10m long.
- SC MM Simplex Kit 503948-5, adapter 1-502632-2, fiber 599204-6, adhesive & primer,* 8-10m long.
- SC SM Simplex Kit 504646-7, adapter 1-502632-1, fiber 599208-9, adhesive and primer,* 8-10m long.

*Loctite® Optiloc® Adhesive 3405 and Optiloc® Primer 3406

3.2. Optical Power Source

The optical power source wavelength shall be 850 ± 30 nanometers and 1300 ± 30 nanometers for multimode and 1310 ± 30 nanometers and 1550 ± 30 nm for singlemode unless otherwise stated in the Test Report.

3.3. Ratings

Performance	Value - MM	Value - SM	Units
Attenuation, Typical (see Note)	0.15	0.15	dB
Return Loss, Typical (see Note)	22	30	dB
Storage Temperature	0 to 60	0 to 60	°C
Operating Temperature	0 to 60	0 to 60	°C

NOTE Typical values represent the mode of the sample data. See Figure 2 for maximum insertion loss and minimum return loss values.

Figure 1

3.4. Performance and Test Description

Product is designed to meet the environmental and optical performance requirements specified in Figure 2. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Visual and mechanical inspection.	Meets 101-46.	TIA/EIA-455-13A.
Attenuation.	Maximum attenuation value for any single specimen is 0.75 dB. See Note.	EIA-455-171, Method D1 (SM). EIA-455-171, Method D3 (MM) (but not a reference quality launch lead).
Return loss.	Minimum return loss value for any single specimen is 20 dB for MM and 26 dB for SM. See Note.	TIA/EIA-455-107A.

Figure 2 (cont)

Test Description	Requirement	Procedure
Low temperature.	<p>For any single specimen: Initial and Final measurements: Maximum attenuation of 0.75 dB. Minimum return loss of 20 dB for MM or 26 dB for SM.</p> <p>During test: Maximum change in attenuation of 0.2 dB.</p>	<p>EIA/TIA-455-188. Place the mated specimens in the chamber and pre-condition for 24 hours at Room Ambient of $23 \pm 5^{\circ}\text{C}$ with 20 to 70% Relative Humidity (RH). Measure and record initial attenuation and return loss at room ambient conditions at end of pre-conditioning. Subject the mated specimens to $0 \pm 3^{\circ}\text{C}$ for 96 hours (4 days). Measure and record optical transmittance every 4 hours for during test. Measure the final attenuation and return loss at least 1 hour after testing with the test specimens at room ambient conditions.</p>
Temperature life.	<p>For any single specimen: Initial and Final measurements: Maximum attenuation of 0.75 dB. Minimum return loss of 20 dB for MM or 26 dB for SM.</p> <p>During test: Maximum change in attenuation of 0.2 dB.</p>	<p>TIA/EIA-455-4C. Pre-condition for 2 hours at Room Ambient of $23 \pm 5^{\circ}\text{C}$ with 20 to 70% RH. Measure and record initial attenuation and return loss at room ambient conditions at end of pre-conditioning. Subject mated specimens to $60 \pm 2^{\circ}\text{C}$ for 96 hours (4 days). Record optical transmittance at 4-hour intervals during test. Measure the final attenuation and return loss 1-2 hours after testing with the test specimens undisturbed in the chamber at room ambient.</p>
Humidity, steady state.	<p>For any single specimen: Initial and Final measurements: Maximum attenuation of 0.75 dB. Minimum return loss of 20 dB MM or 26 dB SM.</p> <p>During test: Maximum change in attenuation of 0.2 dB.</p>	<p>TIA/EIA-455-5C. Method A, Test Condition A. Measure initial attenuation at ambient conditions before testing. Subject mated specimens to 90-95% humidity and $40 \pm 2^{\circ}\text{C}$ for 96 hours (4 days). Record optical transmittance at 4-hour intervals during test. Measure the final attenuation and return loss 1-2 hours after testing with the test specimens at ambient conditions.</p>

NOTE

Shall meet visual requirements, show no physical damage, and shall meet the requirements of additional tests as specified in the Product Qualification Test Sequence in Figure 4.

Figure 2 (end)

3.6. Product Qualification Test Sequence

Test or Examination	Test Groups 1, 2, 3 and 4 (See Note (a))	
	Test Sequence (See Note (b))	Specimen Quantity (See Note (c))
Visual and mechanical inspection	1	24
Attenuation	2	24
Return loss	3	24
Low temperature	4	8
Temperature life	5	8
Humidity, steady state	6	8

- NOTE**
- (a) See paragraph 4.1.A.
 - (b) Numbers indicate sequence in which tests are performed.
 - (c) A specimen consists of a mated connector pair. See paragraph 4.1.A.

Figure 4

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen Selection for Environmental Tests

Eight specimens for environmental tests shall be selected at random from the initial 24 cable assembly specimens of each type built by three operators using field termination methods and instructions. Specimen shall be defined as a cable terminated with 2 connector plugs. Each specimen is cut in the center of the cable and the fiber ends are attached to the measurement system. Connector plugs form a mated pair. Cable used for qualification shall be of type and length specified in Figure 5. Measure the performance of each mated pair. Specimens shall meet the performance requirements in Figure 1.

Test Group	1	2	3	4
Fiber size (µm/µm)	50/125	50/125	9/125	9/125
Fiber type	900-µm buffer	900-µm buffer	900-µm buffer	900-µm buffer
Fiber PN	599204-6	599204-6	599208-9	599208-9
Connector Type	LC	SC	LC	SC
Connector Kit PN	1588706-1	503948-5	1588710-1	504646-7
Coupling Receptacle PN	1457567-5	1-502632-2	1457567-4	1-502632-1
Test Cable Length	8-10m [26.2-32.8 ft]	8-10m [26.2-32.8 ft]	8-10m [26.2-32.8 ft]	8-10m [26.2-32.8 ft]
Test Specimens Required	(See Note)			
Control Cable Required	Yes	Yes	Yes	Yes

- NOTE** Each group shall have 24 specimens initially, from which 8 specimens are randomly selected for environmental tests as shown in Figure 4.

Figure 5

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 4.

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets requirements of Figure 2. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan will specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

5. SPECIAL INSTRUCTIONS

5.1. Cleaning

A. Connector

1. Wipe completely around the connector ferrule twice with a lint-free tissue dampened with isopropyl alcohol.
2. Repeat paragraph 5.1.A.1. using a lint-free dry cloth.
3. Place the dry lint-free cloth on a smooth, flat surface. Holding the connector perpendicular, wipe the ferrule end face across the cloth.
4. Using a microscope, examine the end face for debris. If debris is present, repeat paragraphs 5.1.A.1. through 5.1.A.3.
5. Blow compressed air across the end face of the ferrule.

NOTE

This is the final step prior to connector insertion. DO NOT wipe the ferrule or allow it to touch anything before mating the connector.

6. Mate the connector to the receptacle.

B. Receptacle

1. Blow compressed air through the receptacle.
2. Re-mate the connector(s) to the receptacle.

5.2. Control Cables

Control cables shall be subjected to climatic environmental tests. Transmittance shall be recorded each time a specimen transmittance is made. Changes in control cable power of less than 0.05 dB may be neglected in the test specimen power and loss calculations. If control cable power changes by more than 0.05 dB during the duration of the test or sequence of tests, change in control cable power shall be included in power and loss calculations per TIA/EIA-455-20A.