AMPLIMITE* Shielding Hardware Connector

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for AMPLIMITE* connectors with shielding hardware.

1.2. Qualification

When tests are performed on the subject product line, the procedures specified in 109-Series Test Specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

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

2.1. TE Connectivity (TE) Documents

A. 109-1: General Requirements for Test Specifications

B. 109 Series: Test Specifications as indicated in Figure 1.

C. 114-40006: Connectors, AMPLIMITE HDE-20 for Overmolding

D. 114-40007: Connectors, AMPLIMITE HDP-20 for Overmolding

E. 501-83: Test Report

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2. Materials

A. Connector

1. Shields: Thermoplastic, UL 94V-O
2. Shells: Steel

B. Hardware

1. Shields: Steel
2. Ferrules: Copper

3.3. Ratings

A. Current

1. AMPLIMITE HDP-20: 7.5 amperes per contact maximum
2. AMPLIMITE HDE-20: 5.0 amperes per contact maximum, see Para.3.5.(a)

B. Storage Temperature: -55 to 105℃. While this is the operating temperature of the connector, the operating environment used must not exceed the limits of either the connector or the cable

3.4. Performance and Test Description

Connectors and hardware shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Since the results of many of the tests are dependent not only on the hardware and the connectors, but also on the cable, the cable must be chosen to meet the electrical, mechanical and environmental performance requirements in Figure 1 or the stresses derated appropriately

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of Product	Meet requirements of product drawing and Application Specifications 114-40006 and 114-40007	Visual, dimensional and functional per applicable inspection plan.
ELECTRICAL		
Dielectric Withstanding Voltage	1.0 kvac dielectric withstanding voltage, one minute hold. One milli- ampere maximum leakage current.	Test between contacts and shield of mated connector assemblies; Test Specification 109-29-1.
Shielding Effectiveness	Shielding shall decrease emissions by the following minimum levels: MHz — Shielding 30 to 216 — 35 dB 216 to 1000 — 15 dB	Measure shielding effectiveness of double ended single braid cable; Test Specification 109-90.
MECHANICAL		
Vibration (b)	No discontinuities greater than 1 microsecond.	Subject mated connectors to 10-55-10 Hz traversed in 1 minute at .06 inches total excursion; 2 hours in each of 3 mutually perpendicular planes; Test Specification 109-21-1.
Physical Shock	No discontinuities greater than 1 microseconds.	Subject mated connectors to 50 G's half-sine in 11 milliseconds; 3 shocks in each direction applied along the 3 mutually perpendicular planes; Test Specification 109-26-1.
Cable Pullout	No discontinuities greater than 1 microsecond for shield circuit.	Gradually apply 50 pounds weigh to cable, see Figure 3, maintain weight for 1 hour; Test Specification 109-46, cond A.
Circular Jacket Cable Flexing	No evidence of damage, cracking or chipping.	Subject cable to 100 cycles at a rate of 12 to 14 cycles per minute, see Figure 4; Test Specification 109-20.

Figure 1 (continued)

Test Description	Requirement	Procedure
ENVIRONMENTAL		
Thermal Shock (b) (c)	Dielectric withstanding voltage; insulation resistance.	Subject mated connectors to 5 cycles between -55° and 105℃; Test Specification 109-22.
Industrial Mixed Flowing Gas	Shielding effectiveness final	Subject mated connectors to environmental class III for 10 days; Test Specification 109-85-3.

NOTE

(a) Maximum rated current that can be carried by this product is limited by maximum operating temperature of housings, which is 30℃.Variables which shall be considered for each application are: wire size, connector size, contact material, and ambient temperature.

(b) Shall remain mated and show no evidence of damage, cracking or chipping.

(c) The temperature range of this test must be adjusted as necessary to assure that the temperatures of the cable assemblies are exposed to shall not exceed the temperature rating of either the cable or the connector.

Figure 1 (end)

3.6. Connector and Hardware Qualification and Requalification Tests and Sequences

Test or Examination	Test Group (a)		
	1	2	3
	Test Sequence (b)		
Examination of Product	1	1	1
Dielectric Withstanding Voltage	2, 8		
Shielding Effectiveness	3, 9	2, 4	2, 4
Vibration	4		
Physical Shock	5		
Cable Pullout	6		
Circular Jacket cable Flexing	7		
Thermal Shock			3
Industrial Mixed Flowing Gas		3	

NOTE

(a) See Para 4.1.A.

(b) Numbers indicate sequence in which tests are performed.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. All test groups shall consist of a minimum of 6 double ended cable assemblies of each type (HDE-20 and HDP-20) with shielding hardware crimped on but not overmolded. The cable shall be constructed as follows:

1. 0.032 inch maximum single jacket, 75 to 80 shore durometer
2. Overall tinned copper braid, 90% coverage.
3. Overall foil shield with drain wire
4. The above items constitute approximately 88% of the cross sectional area of the cable
5. All contacts terminated.

Each cable assembly shall have a cable length of 6 feet + .5 inch between the connector back shells as specified in Test Specification 109-90.

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 2.

C. Acceptance

1. Test results from development on pre-qualification samples will be used to determine upper and lower one-sided statistical tolerance limits for 99% reliability at 95% confidence, as follows. Let Xbar and s denote the sample average and standard deviation, respectively, of the test data. Let k denote the normal distribution one-sided tolerance factor for 95% confidence and 99% reliability. The value of k varies with sample size. Values of k are given in various tables, for example, NBS Handbook 91, Factors for One-Sided Tolerance Limits for Normal Distribution. Suitability of the normal distribution for representing the data shall be verified with normal probability plots, goodness of fit tests, etc.

   Then the upper one-sided tolerance limit for 99% reliability at 95% confidence is given by Xbar + ks. The interpretation of thistolerance limit is as follows: based on the test data, and assuming a normal distribution for the test data, we can be 95% confident that 99% of the population of values represented by the sample data will not exceed Xbar + ks. For any test parameter for which there is specified an upper requirement which is not to be exceeded, satisfactory performance of the product is achieved when the value of Xbar + ks does not exceed the requirement value.

   The lower one-sided tolerance limit for 95% confidence and 99% reliability is given by Xbar - ks. This has a similar interpretation and corresponding application to lower requirement values.

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 samples resubmitted for qualification.

4.2. Requalification Testing

Requalification shall be established by the cognizant divisional engineering function and may consist of all or any part of the overall qualification program provided that it is conducted within the required time period.

4.3. 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.

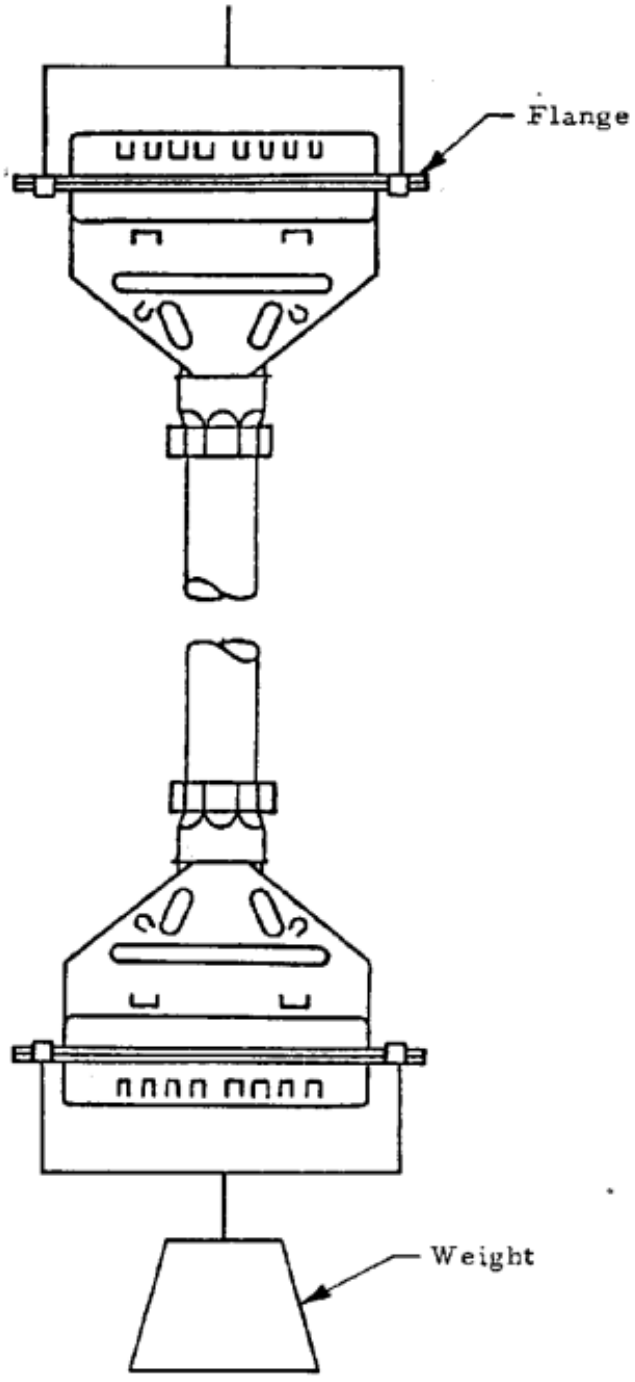

Figure 3
Cable Pullout

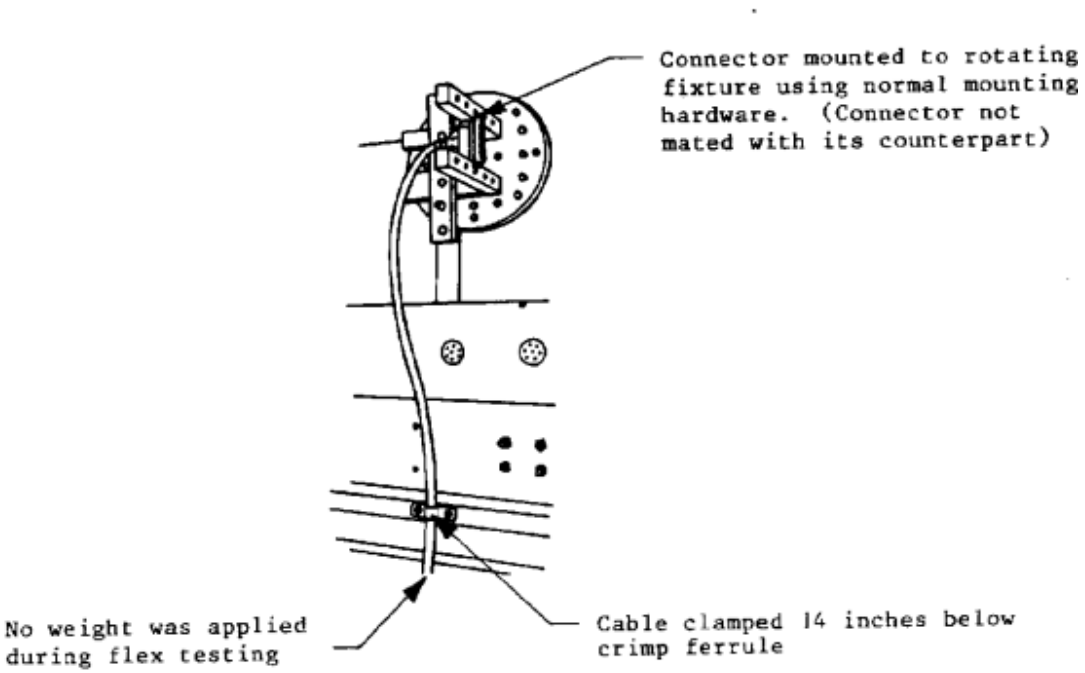

Figure 4
Circular Jacket Cable Flexing