AMPLIMITE* Shielded Cable Clamp Assemblies and Accessories

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for Shielded Cable Clamp Assemblies and Accessories (CCA&A) used with HDP-20 or HDE-20 connectors.

This includes the following types (styles) of shielded cable clamps:

A. Thermoplastic - fully plated

B. Thermoplastic - selectively plated

C. Zinc Die Cast - fully plated

Each of these types can be utilized with one of the following strain relief arrangements:

- Crimp ferrules
- Split ring ferrules
- None

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. 501-80: Test Report

D. Application Specifications

1. 114-40002: Contact, AMPLIMITE* HDE-20 Mass Terminated
2. 114-40003: Contact, AMPLIMITE HDE-20 F-Crimp
3. 114-10000: Contact, 20 DF

E. Product Specifications

1. 108-40011: Connector, HDE-20 Mass Terminated
2. 108-40005: Connector, AMPLIMITE HDP-20

F. 501- : Test Report

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3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

A. Plastic cable clamps: Thermoplastic, UL 94V-O Rated

B. Die case cable clamps: Zinc alloy

C. Assembly hardware: Steel

D. Crimp ferrules: Copper, brass

E. Split ring ferrule: Aluminum

3.3. Ratings

A. Current/Voltage: See Para 3.5.(a)

B. Operating Temperature: -55°to 105℃ Die cast ca ble clamps
-55°to 85℃ Plated plastic cable clamps

This is the maximum operating temperature; however, the operating environment used must not exceed the limits of the cable.

3.4. Performance and Test Description

Accessories shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Results of this are also dependent on the connectors and cables used for the test. These items must conform to the test requirements in Figure 1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of Product	Meets requirements of product drawing and Product Specifications 108-40005 and 108-40011.	Visual, dimensional and functional per applicable inspection plan.
	ELECTRICAL	
Dielectric Withstanding Voltage	1.0 kvac dielectric withstanding voltage, one minute hold. 1.0 milliampere maximum leakage current.	Test between adjacent contacts and contacts and shields of mated connector assemblies; Test Specification 109-29-1.
Insulation Resistance	5000 megohms minimum initial at 500 volts dc.	Test between adjacent contacts and contacts and shields of mated connector assemblies; Test Specification 109-28-4.
Shielding Effectiveness	Shielding shall attenuate emissions by the following levels. Frequency MHz — Shielding 30 – 216 — 40 dB 216 – 1000 — 20 dB	Measure shielding effectiveness of double ended single braid cable; Test Specification 109-90.
	MECHANICAL	
Vibration (b)	No discontinuities greater than 1.0 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.

Figure 1 (continued)

Test Description	Requirement	Procedure
Physical Shock (b)	No discontinuities greater than 1.0 microsecond.	Subject mated connector to 50 G's half-sine in 11 milliseconds; 3 shocks in each direction applied along the 3 mutually perpendicular planes total 18 shocks; Test Specification 109-26-1.
Cable Pullout (c)	CCA&A shall have no physical damage electrical discontinuities greater than 1.0 microsecond.	Apply 50 pounds; AMP or Spec 109-46
Circular Jacket Cable Flexing (c)	CCA&A shall have no physical damage electrical discontinuities greater than 1.0 microsecond.	100 cycles at a rate of or 12 to 14 cycles per minute; Test Specification 109-20.
ENVIRONMENTAL		
Thermal Shock (b)	Dielectric withstanding voltage.	Subject mated connectors to 5 cycles between -55°to 105℃ for zinc die cast C.C.; -55°to 85℃ for plated plastic C.C. Maximum temperature not to exceed Para 3.3.B.; Test Specification 109-22.
Industrial Mixed Flowing Gas		Subject mated connectors to class III industrial mixed flowing gas for 10 day duration per Test Specification 109-85-3.

NOTE

(a) Maximum rated current that can be carried by this product is limited by maximum operating temperature of CCA&A and cable per Para 3.3.B. and temperature rise of contacts as determined by the Product Specifications in Para 2.1.E.. 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) Cable pullout and flex pertains to samples with crimp ferrules only

Figure 1 (end)

3.6. Accessories 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	3, 8		3, 9
Insulation Resistance	2, 7		2, 8
Shielding Effectiveness	4, 9	2, 4	4, 10
Vibration			5
Physical Shock			6
Cable Pullout	5		
Thermal Shock			7
Circular Jacket Cable Flexing	6		
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 each consist of a minimum of six double ended cable assemblies with appropriate shielding hardware. The cable used shall be a single shielded jacketed cable with enough conductors that a minimum of 75% of the contacts in the connector are terminated.

Each cable shall be 6 feet + .5 inches long as specified in the cable length figure of AMP Test Specification 109-90.

All contacts shall be crimped in accordance with Application Specification 114-10000.

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 this tolerance 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. All samples tested in accordance with this specification shall meet the stated tolerance limit.

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.

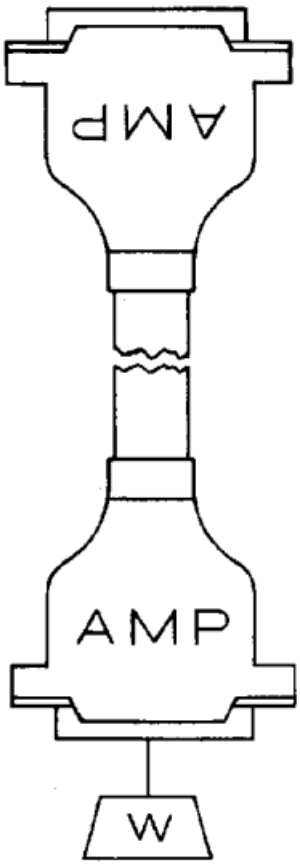


Figure 3